

Factive islands in Russian: An experimental study of relative clause dependencies

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Abstract. It is generally assumed that complements of factive predicates are less transparent for extraction compared to nonfactive predicates. It is also assumed that the violation produced by such extraction is relatively weak, at least for certain types of elements such as (object) arguments, as opposed to other types of elements such as adjuncts. This has led to the notion that complements of factive predicates are weak, or selective, islands. This paper compares complements of factive and nonfactive predicates with respect to argument and adjunct extraction in relative clause dependencies. The question is investigated in two acceptability rating studies, testing DP argument (Experiment 1) and PP adjunct (Experiment 2) extraction. An important feature of the design is that it tests both bare (*čto*) clauses and nominalized (*to*, *čto*) clauses (in oblique/object-of-P positions) with both classes of predicates using the nominalized clauses as a benchmark for strong islandhood. The results showed that factivity of the predicate is associated with a decrease in acceptability for both argument and adjunct extraction, whereas adjunct extraction did not show any degradation relative to argument extraction. Nominalization also lowered the acceptability of extraction but, surprisingly, not for adjunct extraction, which is tentatively explained as the result of processing facilitation (adjunct processing advantage). The results are best explained by two additively combining gradient constraints (penalizing extraction from complements of factive predicates and extraction from nominalized clauses). The paper ends with a brief discussion of the experimental results in the light of different approaches to weak islands, focusing on featural Relativized Minimality.

Keywords: factivity, weak islands, nominalized clauses, argument-adjunct asymmetry, gradience in grammar

Acknowledgments. I wish to thank the audiences of *Readings in the Memory of A. V. Bondarko* (St. Petersburg, 2023) and especially of *Experimental Studies of Language (ExpLing)* (Moscow, 2024), where this material was presented. I also

express my heartfelt thanks to E. A. Lyutikova for carefully reading the first version of this paper and for her insightful comments.

This research is supported by Russian Science Foundation, RSF project 22-18-00037 realized at Lomonosov Moscow State University, <https://rscf.ru/en/project/22-18-00037/>.

Фактивный остров в русском языке: экспериментальные данные относительного выноса

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Аннотация. Сентенциальный актант фактивных предикатов обычно считается менее «прозрачным» для выноса по сравнению с нефактивными предикатами. При этом считается, что вынос из такого актанта связан со сравнительно слабым нарушением, по крайней мере для некоторых типов выносимых элементов, как, например, (неподлежащие) аргументы, в отличие от адьюнктов. Исходя из такого рода контрастов сентенциальный актант фактивных предикатов традиционно классифицируется как «слабый» (селективный) остров. В статье сравниваются сентенциальные актанты фактивных и нефактивных предикатов с точки зрения выноса относительного местоимения *который* из позиции аргумента или адьюнкта. Приводятся результаты двух экспериментов на оценку приемлемости, в которых проверялся относительный вынос DP-аргумента (Эксперимент 1) и PP-адьюнкта (Эксперимент 2). Особенностью экспериментального дизайна было использование как простых клауз со *что*, так и номинализованных клауз с *то, что* (в позиции косвенного падежа или при предложе) с обоими классами предикатов; последние служили для контроля неприемлемости выноса из сильного острова. Результаты показали, что фактивность предиката связана с понижением приемлемости как для выноса аргумента, так и для выноса адьюнкта, при этом вынос аргумента, вопреки ожиданиям, не был связан с понижением приемлемости относительно выноса аргумента. Наличие *то, что* также понижало приемлемость выноса, но по не вполне ясным причинам не для выноса адьюнкта. Предлагается предварительное объяснение этому факту, основанное на меньшей нагрузке

на рабочую память при обработке адьюнктного выноса по сравнению с аргументным. Основные результаты указывают на наличие двух независимых (аддитивных) градуальных ограничений: на вынос из сентенциального актанта фактивных предикатов и на вынос из номинализованной клаузы. В заключении дается краткое обсуждение результатов экспериментов в свете различных подходов к слабым островам с акцентом на теории признаковой относительной минимальности.

Ключевые слова: фактивность, слабые острова, номинализованные клаузы, асимметрия аргумент — адьюнкт, градуальность в грамматике.

Благодарности. Я хочу поблагодарить слушателей «Чтений памяти А. В. Бондарко. Актуальные проблемы функциональной грамматики» (Санкт-Петербург, 2023 г.) и в особенности слушателей конференции «Экспериментальные исследования языка (ExpLing)» (Москва, 2024 г.), где были представлены основные результаты данного исследования. Также выражаю искреннюю благодарность Е. А. Лютиковой за внимательное прочтение первой версии статьи и за очень ценные замечания.

Исследование выполнено за счет гранта Российского научного фонда № 22-18-00037, реализуемого в МГУ им. М. В. Ломоносова, <https://rscf.ru/project/22-18-00037/>.

1. Introduction

1.1. Factive clauses as weak islands

Factive clauses¹ are often taken to differ from nonfactive clauses not only in terms of their semantic/pragmatic properties (i.e., the truth of the former being presupposed) but also in terms of their syntactic properties [Kiparsky, Kiparsky 1971; Kastner 2015]². One of the distinguishing

¹ Throughout the paper, the term “factive clauses” is used descriptively to refer to clausal arguments of factive predicates with no commitment to their analysis or theoretical status.

² For example, according to [Kastner 2015], factive clauses typically allow (or require) overt nominal complements; can be replaced by nominal proforms; and disallow

features of factive clauses is that they are standardly assumed to be less transparent for certain types of syntactic dependencies such as *wh*-interrogative and relative clause formation, represented as movement, or extraction, in syntactic theory (the dependency occurring between the position where the *wh*-word/relative pronoun is pronounced and the position where it is interpreted, i.e. from which it is extracted). Since Ross's [1967] seminal dissertation, such less transparent syntactic domains are called "islands". More specifically, factive clauses are usually classified as weak islands (a.o., [Hegarty 1992; Haegeman, Ürögdi 2010; Haegeman 2012; Kastner 2015]), as opposed to strong islands. The term "weak islands" refers to domains that in contrast to strong islands, the more prototypical case of islands that disallow any extraction, allow extraction of some phrases, while disallowing extraction of other phrases (see [Szabolcsi, Lohndal 2017] for a recent review). The traditional and perhaps most well-known (e.g., [Chomsky 1986]) contrast in extractability is between arguments (or, more precisely, objects) and adjuncts, the latter being more difficult to extract.

This contrast can be illustrated in (1b)–(1c), where extraction of the object *wh*-word *what* from the complement of the cognitive factive *notice*, as in (1c), is more acceptable than the corresponding extraction of the adjunct *how* in (1b), although it is still not fully acceptable (cf. the baseline case with a nonfactive clause in (1a)).

- (1) a. *How_i do you suppose [that Mary had fixed the car ____i]?³*
 b. **How_i did you notice [that Mary had fixed the car ____i]?⁴*
 c. *??What_i did you notice [that Mary had fixed ____i]?[?]*

[Haegeman, Ürögdi 2010: 120]

main clause phenomena such as argument fronting inside the embedded clause.

³ Here and below, I indicate extraction with an underscore co-indexed (by "i") with the *wh*-word, instead of using *t*(race), adapting the original examples where necessary. I also add brackets to the original examples where necessary in order to more transparently indicate that the *wh*-word originates in the embedded clause (see also next footnote).

⁴ The sentence is acceptable on the irrelevant reading where the manner adverb modifies the matrix clause.

Since the early work on asymmetries in extractability (based on the ECP principle) [Huang 1982; Lasnik, Saito 1984; Chomsky 1986], which focused on the argument/adjunct distinction, a wide range of subtle syntactic, semantic and pragmatic factors have been identified that can lead to the differential effect of extraction from weak islands [Szabolcsi, Lohndal 2017]. Nevertheless, in this paper I will keep to this most basic contrast between argument and adjunct extraction, which looks like a good starting point in view of the fact that there is very little work on Russian factive islands.

Factive islands have received a number of different accounts in the literature, including syntactic and semantic ones (a.o., [Haegeman, Ürögdi 2010; Kastner 2015; Abruśán 2014]). I will not attempt to review them here, nor decide among them (but see *Section 4* for some discussion). Instead, I will mostly focus on whether there is experimental evidence for factive islands in Russian, which turns out to be a nontrivial question.

1.2. Challenges of factive islands in Russian

Russian data pose methodological problems for the traditional understanding of factive clauses as weak islands. First, as is well-known, extraction from *čto*-clauses in Russian is independently degraded, as compared to English [Khomitsevich 2007; Lyutikova, Gerasimova 2021], as illustrated in (2).

- (2) ^{??}*Komu, Ira skazala, [čto vy otdali kotjat ___i]?
 ‘Who did Ira say that you gave kittens to?’ [Morgunova 2021b: 80]*

As a result, extraction from factive clauses should at best be of intermediate quality. This makes it more difficult to detect a contrast between “good” and “bad” extractions (necessary for establishing the weak island status) and calls for using formal methodology of collecting acceptability judgments (see, e.g., [Sprouse et al. 2016]).

A second problem is similar in kind but more severe. It is sometimes argued that *čto*-clauses in Russian are in general weak islands [Bailyn 2020: 648]. For example, according to [Bailyn 2020], they show

argument/adjunct asymmetry characteristic of weak islands at least for wh-interrogative extraction, as in (3), cf. (2) (but see [Demina 2021] for experimental results that do not support this claim).

- (3) **Kak_i ty dumaeš', [čto Petr počinil mašinu ____i]?*
 'How do you think that Peter fixed the car?' [Bailyn 2020: 648]

If Bailyn's characterization is correct, establishing factive islands in Russian becomes more difficult because it can no longer be based on argument/adjunct asymmetry as such but must rely on the contrast **between** factive and nonfactive clauses in the **degree** of (un)acceptability of extraction for arguments, adjuncts or both. Thus, one must presuppose either at least two levels of "mild" unacceptability (e.g., "??" vs. "?*") — if the relevant diagnostic is based on argument extraction, or at least two levels of "severe" unacceptability (e.g., "**" vs. "**") — if it is based on adjunct extraction. While these assumptions are not problematic in themselves, they present a departure from the standard way of diagnosing factive islands, as they rely on finer-grained contrasts not accessible to introspection. Furthermore, by assuming more levels of acceptability, they make the standard binary conception of grammaticality extremely unlikely (see [Villata et al. 2016; Rizzi 2018] for discussion).

A third problem is not a problem *per se* but a particular aspect of the grammatical pattern in Russian not observed in languages like English, namely the presence of **nominalized clauses** introduced by the distal demonstrative *to* (i.e., *to*, *čto*-clauses), which systematically alternate with bare *čto*-clauses (a.o., [Kobozeva 2013; Knyazev 2016; Bondarenko 2022]). The relevance of nominalized clauses lies in the fact that they are standardly taken to be strong islands [Khomitsevich 2007; Bondarenko 2022], as illustrated in (4).

- (4) **Kogo_i Lena dobilas' [togo, čto oni pozvali ____i na prazdnik]?*
 'Who did Lena succeed in ensuring that they invited to the party?'
 [Bondarenko 2022: 328]

On the binary grammaticality model (or at least where levels of ungrammaticality are not distinguished), this may suggest that the

acceptability of extractions from nominalized clauses cannot be further aggravated by the factivity of the complement and by the adjunct status of the extracted element. However, if one assumes that “full” ungrammaticality allows for gradations, one may allow for more theoretical possibilities. For example, it could be that degradation due to extraction from a nominalized clause is compounded with (i) extraction from a factive clause; or (ii) extraction of an adjunct from a *čto*-clause in case it is a weak island; or (iii) extraction of an adjunct from a factive clause in case it is a weak island.

To summarize, although the task of establishing factive islands in Russian does not directly depend on acceptability data for nominalized clauses (as long as there is a contrast for bare clauses), the relevant data can give a better understanding of the extraction properties of factive clauses, justifying inclusion of nominalized clauses in the experimental design.

1.3. The present study

The aim of this paper is to experimentally compare relative extractions from factive and nonfactive clauses in Russian in order to test whether extractions from factive clauses are generally worse than extractions from nonfactive clauses (Question 1 in (5a)) and whether the former show a contrast between argument and adjunct extractions (Question 2 in (5b)). Thus, the primary goal is to test whether Russian factive clauses show characteristic properties of weak islands. Two further questions are addressed. First, the paper tests whether the contrast between argument and adjunct extractions is also shown by nonfactive clauses (Question 3 in (5c)). Second, it tests whether nominalized clauses are indeed strong islands in the sense of leading to strong ungrammaticality for any type of extraction and whether there is any further degradation due to factivity and/or the adjunct status of the extracted element (Question 4 in (5d)), as explained above (see *Table 1*).

- (5) a. **Question 1:** Are extractions from factive clauses worse than extractions from nonfactive clauses and if yes, in what ways?

- b. **Question 2:** Do extractions from factive clauses show argument/adjunct asymmetry characteristic of weak islands?
- c. **Question 3:** Do extractions from nonfactive clauses show argument/adjunct asymmetry characteristic of weak islands?
- d. **Question 4:** Are nominalized clauses indeed strong islands, and if yes, do they still show any further contrasts?

To answer these questions, two acceptability rating studies were conducted, Experiment 1 testing argument extraction and Experiment 2 testing adjunct extraction. Both experiments manipulated the factivity of the matrix predicate (as a between-items variable), as well as the presence of clausal nominalization. Sentences with extractions were also systematically compared with baseline sentences without extraction in order to take into account independent (dis)preference for nominalized clauses. Otherwise, the design of the two studies was very similar.

Two important features of the design require comment. First, the experiment used **relative extraction** with *kotoryj* ‘which’, as opposed to more commonly studied wh-interrogative extraction (see [Lyu-tikova 2009] for an overview of syntactic properties of relative clauses with *kotoryj* ‘which’, including movement properties)⁵. Relative extraction is assumed to be more permissive compared to wh-interrogative extraction, at least for some island types [Lyu-tikova 2009: 467–471; Morgunova 2021a: 54–55], which may be beneficial for avoiding overall too low ratings for extraction sentences, which may prohibit detecting contrasts among different kinds of extraction. In addition, sentences with relative extraction usually sound more natural in a zero context, whereas interrogative sentences may require a supporting context, at least for naive participants.

Second, only predicates alternating between bare *čto*-clauses and nominalized *to*, *čto*-clauses **in the oblique case** or **inside a PP** (but disallowing complements in the accusative), such as *nadejat'sja* ‘hope’ and *žalet* ‘regret’, were tested. This resulted in the exclusion of some

⁵ This may also be a potential drawback, as I discuss in *Section 4*.

of the prototypical factive and nonfactive verbs like ‘know’, ‘realize’ or ‘think’. The reason for this is that (exclusively) accusative-taking verbs such as *predpolagat* ‘suppose’ and *ponimat* ‘realize’ normally disallow or resist nominalized clauses, at least outside special contexts [Khomitsevich 2007; Knyazev 2016], and thus cannot provide appropriate baselines for extraction data, in contrast to oblique/PP-taking verbs, which systematically allow nominalized clauses. As for accusative-taking verbs that alternate with *about*-PP complements, such as *skazat* ‘say’ and *znat* ‘know’, although these allow nominalized clauses inside PPs, it is unclear whether the latter bear the same thematic relation to the verb as bare clauses.

In previous research, neither extraction from factive clauses nor extraction from nominalized clauses in Russian has been experimentally tested, with the exception of [Knyazev 2023]⁶. However, the latter study only tested argument extraction and thus does not provide direct evidence regarding the weak island status of factive (and nonfactive) clauses, which is central to the present research.

The main goal of this study is to fill the descriptive gap concerning the status of factive islands in Russian. The study aims to provide a detailed empirical picture, which can serve as a basis for evaluating existing theories of weak islands, a topic I will only briefly touch on in *Section 4*. Finally, the results of the study bear on a more general question regarding the categorical (binary) vs. gradient model of grammaticality, an important theoretical issue, which I have little to say about in this paper.

The structure of the paper is as follows. *Section 2* discusses Experiment 1 testing argument extractions. *Section 3* discusses Experiment 2 testing adjunct extractions. *Section 4* contains a general discussion of the results of the two experiments, including their theoretical implications, as well as a brief conclusion.

⁶ Another exception is [Rygaev (to appear)], which was brought to my attention after this paper was completed. I leave the discussion of Rygaev’s study to future work.

2. Experiment 1: Argument extraction

2.1. Remarks on the experimental design

While the present study addressed several research questions involving multiple points of comparison, as in (5) above, the experiments most directly focused on Question 1 in (5a), concerning the comparison between extractions from factive and nonfactive clauses. Thus, Experiment 1 tested whether argument extractions from factive clauses (for both bare and nominalized clauses) are less acceptable compared to nonfactive clauses and Experiment 2 did the same for adjunct extractions.

By contrast, the difference between argument and adjunct extraction (for both factive and nonfactive clauses) (see Questions 2–3 in (5b)–(5c)), was addressed only indirectly, by comparing them with the corresponding extraction from nominalized clauses (as well as with unacceptable fillers). The underlying assumption was that if nominalized clauses are strong islands whereas bare *čto*-clauses (whether factive or nonfactive) are weak islands, we should expect a contrast between bare and nominalized clauses for argument extractions (i.e., extractions being more acceptable for bare clauses) but no such contrast for adjunct extractions, assuming that adjunct extractions from weak islands should amount to extractions from strong islands.

Since nominalized clauses were included in the design, the study was also able to address Question 4 in (5d), concerning their strong island status, which was achieved by comparing the corresponding argument and adjunct extractions from factive and nonfactive predicates (and also by comparing them with unacceptable fillers).

As was mentioned earlier, in order to control for an independent (dis)preference for nominalized clauses baseline/no extraction conditions were also included so that all comparisons involving extractions were relative to the baseline.

Note that the present design gives logical priority to the factive/nonfactive asymmetry over the argument/adjunct asymmetry. Thereby it assumes

that ascertaining that factive clauses are less transparent for extraction than nonfactive clauses (at least in some conditions) is a precondition for establishing the (weak) island status of factive clauses. This seems reasonable as it is only after we have established that factive clauses have their own extraction profile as distinct from nonfactive clauses, i.e., that factive island exists as a separate constraint, that we should ask whether it conforms to standard weak island diagnostics (argument/adjunct asymmetry).

2.2. Design and materials

2.2.1. Experimental sentences

The experiment had a $2 \times 2 \times 2$ design with factors PREDICATE CLASS (non-factive vs. factive), SENTENCE TYPE (no extraction vs. extraction) and COMPLEMENT TYPE (bare vs. nominalized). The non-factive conditions are illustrated in (6a)–(6d) and the factive conditions in (7a)–(7d).

- (6) a. *On nadejalsja, čto Maša polučit posylku čerez nedelju.*
 ‘He hoped that Masha would get the package in a week.’
 [NON-FACTIVE | NO EXTRACTION | BARE]
- b. *On nadejalsja na to, čto Maša polučit posylku čerez nedelju.*
 ‘He hoped that Masha would get the package in a week.’
 [NON-FACTIVE | NO EXTRACTION | NOMINALIZED]
- c. *Posylka, kotoruju_i on nadejalsja, čto Maša polučit ___; čerez nedelju, poterjalas’ na počte.*
 ‘The package that he hoped that Masha would get in a week was lost in the post.’
 [NON-FACTIVE | EXTRACTION | BARE]
- d. *Posylka, kotoruju_i on nadejalsja na to, čto Maša polučit ___; čerez nedelju, poterjalas’ na počte.*
 ‘The package that he hoped that Masha would get in a week was lost in the post.’
 [NON-FACTIVE | EXTRACTION | NOMINALIZED]

- (7) a. *Ona žalela, što žurnal ne prinjal k publikaciji ètu stat'ju.*
 ‘She regretted that the journal had not accepted this article for publication.’
 [FACTIVE | NO EXTRACTION | BARE]
- b. *Ona žalela o tom, što žurnal ne prinjal k publikaciji ètu stat'ju.*
 ‘She regretted that the journal had not accepted this article for publication.’
 [FACTIVE | NO EXTRACTION | NOMINALIZED]
- c. *Stat'ja, kotoruju_i ona žalela, što žurnal ne prinjal ____i k publikaciji, byla dejstvitel'no neudačnoj.*
 ‘The article that she regretted that the journal had not accepted for publication was indeed a failure.’
 [FACTIVE | EXTRACTION | BARE]
- d. *Stat'ja, kotoruju_i ona žalela o tom, što žurnal ne prinjal ____i k publikaciji, byla dejstvitel'no neudačnoj.*
 ‘The article that she regretted that the journal had not accepted for publication was indeed a failure.’
 [FACTIVE | EXTRACTION | NOMINALIZED]

Four nonfactive and four factive predicates were tested, as in (8a)–(8b).

- (8) a. **Nonfactive predicates**
nadejat'sja (*na*+ACC) ‘hope’, *uveren* (*v*+PREP) ‘certain’, *rasčityvat'* (*na*+ACC) ‘count on’, *namekat'* (*na*+ACC) ‘hint’
- b. **Factive predicates**
žalet' ‘regret’ (*o*+PREP), *rad* (DAT) ‘glad’, *udivljat'sja* (DAT) ‘be surprised’, *gordit'sja* (INS) ‘be proud’

With the exception of the speech verb *namekat'* ‘hint’, the nonfactive class was represented by various propositional attitude predicates. The factive class was represented by emotive factives. Each group had one adjectival (*uveren* ‘certain’ and *rad* ‘glad’) and three verbal predicates. All nonfactives and one factive (*žalet'* ‘regret’) selected for a PP complement, with the remaining factives selecting for an oblique complement. The

category of the selected complement (PP vs. oblique) was not matched or controlled for as it was assumed that this should not influence the results given that nominalized clauses sound equally natural in both oblique and PP positions (see, e.g., [Khomitsevich 2007] and also *Section 1*), although the results for individual predicates were also inspected.

With each predicate, two sentence sets of four conditions as in (6)–(7) were constructed. The relative clause modified the matrix subject in one half of the sentences (cf. (6)–(7)) and the oblique or direct object in the other half⁷. (The full list of materials, with mean ratings, is given in the Appendix.) This was done to ensure some variety, as well as to make the experimental manipulation less apparent. All relative clauses involved relativization of the direct object. With one exception, the head of the relative clause was always singular.

The experimental sentences were distributed in a Latin Square design among four participant lists such that each participant judged only one sentence in each four-condition set such as (6) or (7) and the same number of sentences (i.e., two) per each of the four between-item conditions for both predicate classes, e.g., two sentences with extraction from bare nonfactive clauses, hence jointly 16 experimental sentences.

2.2.2. Fillers

There were also 18 filler sentences. (See Appendix for the full list.) There were six unacceptable fillers that involved sentences with selectional violations. In half of the sentences, the obligatory nominalizer *to* was missing, as in (9a); in the other half, the case marking of the nominalizer *to* violated the selectional restriction of the matrix predicate, as in (9b). In addition, half of the sentences had subjunctive and the other half indicative complements, to ensure some variety.

⁷ And example of the latter kind of items is provided in (i).

(i) *Ivan otložil den'gi na operaciju, kotoruju on nadejalsja (na to), čto vrači sdelajut emu v sledujuščem godu.*

‘Ivan saved money for the surgery that he hoped the doctors would give him next year.’

- (9) a. **Uspex firmy byl vyzvan, čto ona èksperimentirovala s formatom magazinov.*
 Intended: ‘The success of the firm was caused by the fact that it experimented with the format of the stores.’
- b. **Putešestvenniki nuždalis’ tem, čtoby ix kto-to prijutil.*
 Intended: ‘The travellers needed someone to host them.’

There were also six acceptable sentences, all of which involved complement clauses with further embedding of the relative clause modifying the non-subject argument of the complement clause, as in (10). Similarly to acceptable fillers, half of the sentences had nominalized clauses and the other half bare clauses; half of the sentences had subjunctive and the other half indicative complements.

- (10) *Futbolisty verili v to, čto smogut pobedit’ klub, kotoryj v prošlom godu vyigral Ligu čempionov.*
 ‘Soccer players believed that they would be able to beat the team that won the Champions League last year.’

The aim of acceptable fillers was to provide a baseline for long-distance extraction sentences in the experimental conditions (cf. (6c)–(6d) and (7c)–(7d)) that would be roughly matched in length and (surface) syntactic complexity so that one could ensure that the degradation associated with the long-distance extraction conditions was specifically due to an island constraint rather than syntactic complexity in general.

An additional six fillers involved sentences with long-distance relative extractions. Two sentences involved complex NP violations, as in (11), and served as baselines for unacceptable extraction from an island.

- (11) **Kontrakt, kotoryj napadajuščij otverg [predloženie o tom, čtoby klub prodlil na sledujuščij god], soderžal semiznačnuju summu.*
 Intended: ‘The contract that the striker rejected the offer for the team to prolong for the next year had a 7-digit number in it.’

Two further sentences involved extractions from complement clauses with *čtoby* (with verbs *xotet* ‘want’ and *prosit* ‘ask’), as in (12a), which are usually considered fully acceptable [Khomitsevich 2007; Demina 2021].

They served as baselines for acceptable long-distance extractions. Finally, two sentences involved extractions from complement clauses with *čto* with more prototypical/frequent nonfactive verbs *dumat* ‘think’ and *predpolagat* ‘suppose’, as in (12b) (recall that the experimental sentences used rather nonprototypical nonfactive predicates). They were included to provide an acceptable baseline specifically for extraction from *čto*-clauses, assuming that complements of more common nonfactive predicates may be more transparent for extraction [Dąbrowska 2008; Liu et al. 2022].

- (12) a. *Vino, kotoroe_i ona xotela, čtoby muž prines ___i k užinu, bylo raskupleno.*
 ‘The wine that she wanted her husband to bring for dinner was sold out.’
- b. *Lera sostavila spisok produktov, kotorye_i ona dumala, čto Kolja kupil ___i na èti den’gi.*
 ‘Lera composed the list of groceries that she thought Kolya bought for this sum of money.’

Apart from diverting attention of participants away from the experimental manipulation, fillers (specifically, unambiguously acceptable and unacceptable ones) were used to exclude participants who were not paying attention to the task (or had nonstandard grammar). In addition, as was mentioned above, fillers were used as (un)acceptability baselines for experimental sentences.

2.3. Procedure and participants

The fillers were combined with the experimental sentences into 34-item lists in an automatically randomized order (for each participant). Each list started with two additional warm-up sentences—one acceptable and one unacceptable (with a *čto*-clause-taking predicate followed by a *čtoby*-clause)—that were not marked as such. Participants had to judge the acceptability of each sentence on a 1–7 scale. The use of the scale was illustrated by one unacceptable sentence (with a *čtoby*-clause-taking predicate

followed by a *čto*-clause) with the recommended rating of 1–2, and two acceptable sentences, including one with a relative clause, rated as 7. Participants completed the task at their own pace, which took on average 8 minutes.

The experiment was hosted on PCIBex Farm (<https://farm.pcibex.net/>), with the participants recruited via Toloka (<https://toloka.ai/>; formerly Yandex.Toloka) for a modest fee of \$0.125⁸. Fifty seven tolokors submitted the results; of these results of 49 participants were included in the statistical analysis (see below)⁹.

2.4. Analysis

The results of 8 participants were excluded based on the following criterion: the mean rating of both acceptable fillers and sentences with long-distance extraction from *čtoby*-clauses (cf. (12a)) had to be larger than the mean rating of both unacceptable fillers with selectional violations and sentences with extraction from complex NPs (cf. (11)).

As is standard practice, prior to the analysis the ratings were z-score transformed (by subtracting the participant's mean from the participant's raw rating and dividing it by the participant's standard deviation), which reduces biases in the use of the rating scale [Sprouse et al. 2016]. But whenever possible, raw ratings are also reported.

The z-score transformed ratings were analyzed using linear-mixed effects models with maximal random effects structure justified by the design and allowing for convergence [Barr et al. 2013]. Predicate class, sentence type and complement type (treatment-coded with NONFACTIVE, NO EXTRACTION and *ČTO*-CLAUSE as reference levels), as well as all their interactions were included in the model as fixed effects¹⁰. Simpler models

⁸ The criteria for participation included Russian as a native language, as well as Russia-based IP and phone number.

⁹ Due to a technical error, the age of participants was not recorded.

¹⁰ The formula for the main model was: $rating.zscore \sim sentence.type * complement.type * predicate.class + (1 + complement.type | item) + (1 + sentence.type + predicate.class | subject)$.

with two factors and their interaction were also fit where necessary, as well as models with one factor for pairwise comparisons. The analysis was implemented using the `lmerTest` package for R (version 4.2.3) [Kuznetsova et al. 2017].

2.5. Results

2.5.1. Fillers

The results for the fillers are given in *Table 1*.

Table 1. Mean raw and z-score rating with standard error by filler type (Experiment 1)

filler type	mean raw rating (SE)	mean z-score rating (SE)
acceptable	6.45 (0.03)	0.85 (0.03)
extraction: <i>čtoby</i> -clauses	5.18 (0.09)	0.35 (0.07)
extraction: <i>čto</i> -clauses	3.15 (0.12)	-0.45 (0.07)
unacceptable: selection	2.69 (0.07)	-0.65 (0.04)
unacceptable: complex NP	1.98 (0.12)	-0.92 (0.05)

As can be seen, participants clearly distinguished acceptable from unacceptable fillers. As expected, fillers with long-distance extraction from *čtoby*-clauses received fairly high ratings, close to acceptable fillers, while extraction from *čto*-clauses was rated slightly below the midpoint of the scale but above unacceptable fillers with selectional violations¹¹. Sentences with complex NP violations were rated lowest, which

¹¹ One of the unacceptable fillers with selectional violations given in (i) received a relatively high rating of 3.73 (z-score -0.22) compared to others ranging from 2.27 (-0.85) to 2.84 (-0.59). Excluding this filler, the mean rating of this category is 2.49 (-0.74), which is likely a better estimate of acceptability of selectional violations.

(i) *Meroprijatija byli napravleny, čtoby čelovek osvoilsja v kollektive.*

‘The activities were aimed at the person getting familiarized with the group.’

may be due to the additional complexity of the sentence (apart from the island violation).

Overall, the results of the fillers indicate that participants were able to distinguish various degrees of acceptability roughly in accordance with theoretical expectations.

2.5.2. Experimental sentences

The means for the experimental conditions are given in *Table 2* and *Figure 1* (p. 376).

Table 2. Mean raw and z-score rating by predicate class, sentence type and complement type (Experiment 1)

predicate class	sentence type	complement type	mean raw rating (SE)	mean z-score rating (SE)
nonfactive	no extraction	bare	6.62 (0.05)	0.92 (0.04)
		nominalized	6.76 (0.03)	0.97 (0.04)
	extraction	bare	3.32 (0.12)	-0.40 (0.07)
		nominalized	2.48 (0.13)	-0.71 (0.06)
factive	no extraction	bare	6.69 (0.03)	0.94 (0.04)
		nominalized	6.76 (0.03)	0.98 (0.04)
	extraction	bare	2.26 (0.13)	-0.82 (0.06)
		nominalized	1.76 (0.10)	-1.06 (0.05)

Starting from the reference level, i.e., nonfactive *čto*-clauses, we see a clear effect of extraction ($\beta = -1.33$, $SE = 0.08$, $p < 0.001$), confirming the view that extraction from nonfactive *čto*-clauses (with the z-score rating of -0.40) is mildly unacceptable. Note that this rating is similar to the result for the fillers that involved extraction from *čto*-clauses with prototypical nonfactive predicates *dumat* ‘think’ and *predpolagat* ‘suppose’ (-0.45) but is higher than that of selectional violations (-0.65).

Moving on to factive *čto*-clauses, the effect of extraction (with the mean rating of -0.82) is visually stronger compared to nonfactive

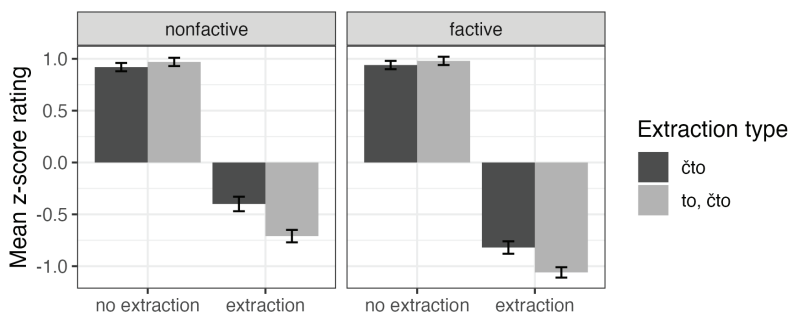


Figure 1. Mean raw and z-score rating by condition (Experiment 1)

čto-clauses and is lower than selectional violations and is only slightly higher than complex NP violations (-0.92), suggesting that argument extraction from (emotive) factive clauses is generally unacceptable. This is confirmed by a significant interaction between factivity and extraction ($\beta = -0.43$, $SE = 0.10$, $p < 0.001$). Pairwise comparison of extraction from bare factive vs. nonfactive clauses showed a reliable effect of factivity ($\beta = -0.41$, $SE = 0.15$, $p = 0.015$), suggesting that the above interaction was driven by the difference in the extraction (rather than base-line) conditions.

Turning to nominalized clauses, extraction from nominalized nonfactive clauses (with the mean rating of -0.71) was rated lower compared to bare clauses, in line with their status as unacceptable in the literature. This was confirmed by a significant interaction between nominalization and extraction ($\beta = -0.36$, $SE = 0.10$, $p < 0.001$). Pairwise comparison of extraction from bare vs. nominalized nonfactive clauses also showed a marginal effect of nominalization ($\beta = -0.31$, $SE = 0.16$, $p = 0.09$).

Nominalization also affected extraction from factive clauses (with the mean rating of -1.06), making it less acceptable compared to bare factive clauses. This is confirmed by the lack of three-way interaction between nominalization, extraction and predicate class ($\beta = 0.08$, $SE = 0.14$, $p = 0.56$), suggesting that nominalization reduced acceptability of extraction similarly for both factive and nonfactive predicates. This was confirmed by the interaction between nominalization and extraction

in a model for factive clauses ($\beta = -0.28$, $SE = 0.09$, $p = 0.001$). Pairwise comparison of extraction from bare vs. nominalized factive clauses showed an effect of nominalization ($\beta = -0.25$, $SE = 0.08$, $p = 0.002$), suggesting that the interaction was driven by the extraction condition. In addition, pairwise comparison of extraction from nominalized nonfactive vs. factive clauses ($\beta = -0.35$, $SE = 0.11$, $p = 0.008$) showed an effect of factivity, suggesting that extraction from nominalized clauses is less acceptable with factive predicates¹². Overall, these contrasts suggest that factivity and nominalization additively combine to exacerbate extraction from complement clauses.

2.5.3. Results for the individual predicates

The results for the individual predicates, shown in *Table 3*, largely conform to the general pattern, despite some variability among predicates of the same class.

Table 3. Mean z-score rating by predicate, sentence type and complement type (Experiment 1)

predicate class	predicate	no extraction		extraction	
		<i>čto</i>	<i>to, čto</i>	<i>čto</i>	<i>to, čto</i>
nonfactive	<i>nadejat'sja</i> 'hope'	0.95	1.00	-0.10	-0.64
	<i>uveren</i> 'certain'	1.00	0.86	-0.13	-0.92
	<i>rasčityvat'</i> 'count on'	0.99	1.07	-0.51	-0.58
	<i>namekat'</i> 'hint'	0.76	0.96	-0.87	-0.72
factive	<i>žalet'</i> 'regret'	0.97	0.95	-0.72	-0.88
	<i>rad</i> 'glad'	0.94	1.02	-0.75	-1.01
	<i>udivit'sja</i> 'be surprised'	1.11	1.05	-1.00	-1.36
	<i>gordit'sja</i> 'be glad'	0.76	0.89	-0.80	-1.00

¹² Other effects were not significant, including the effect of nominalization (in the baseline nonfactive condition), the effect of factivity (in the baseline bare condition) and the interaction between factivity and nominalization (in the baseline condition).

The only clear outlier is the nonfactive verb *namekat* ‘hint’, which received a rather low rating in the bare extraction condition (-0.87), which was lower than the corresponding rating for three of the factive predicates. In addition, it is the only predicate with which extraction from nominalized clauses was more, rather than less, acceptable compared to bare clauses. However, we may also note that in contrast to other nonfactive predicates, *namekat* ‘hint’ showed a more pronounced dispreference for *čto*-clauses in the baseline condition, which may perhaps partly explain the unexpectedly low rating of the bare extraction condition.

2.6. Discussion

The results confirm the characterization of nonfactive extraction in Russian, which received the mean rating below the midpoint of the scale, as mildly unacceptable. The results are also in line with the status of nominalized clauses as strong islands since their mean rating in the two extraction conditions was consistently below the corresponding bare clauses and was in absolute terms close to or below selectional violations (see Question 4 in (5d)).

Turning to the contrast between extraction from factive and nonfactive clauses, which was the main point of Experiment 1 (see Question 1 in (5a)), the results showed that factive clauses were less transparent for argument extraction compared to nonfactive clauses. This is line with the reported (mild) effect of argument extraction from factive clauses in languages like English [Ambridge, Goldberg 2008; Haegeman, Ürögdi 2010; Kastner 2015] and thus provides support for the special status of extraction from factive complements. One difference is that in Russian argument extraction from factive clauses is **in absolute terms** strongly degraded, with the acceptability level at the low end of the scale, which is unsurprising given that extraction from nonfactive clauses was rated almost 0.40 pts below the midpoint (which is considerable since the majority of z-score ratings were located in the interval $[-1; 1]$). Importantly, however, **in relative terms** extraction from bare factive clauses still did not reach the lowest level of unacceptability and was more acceptable compared to extraction from the corresponding nominalized clauses.

Perhaps, the most unexpected result is that the contrast in extraction from factive and nonfactive complements was also observed for nominalized clauses. That is, while extraction from nominalized nonfactive clauses was in absolute terms strongly degraded, just like extraction from bare factive clauses, it was still significantly more acceptable compared to extraction from nominalized factive clauses. Incidentally, this implies that participants were able to systematically distinguish at least two levels of acceptability at the low end of the scale, defying the categorical (binary) notion of a strong island (cf. Question 4 in (5d)).

To summarize, the fact that argument extraction from factive, compared to nonfactive, clauses was reliably degraded despite a relatively low rating of the latter, provides supporting evidence for the existence of a factive island in Russian¹³. Yet, to probe into the nature of this island, specifically to test whether it observes characteristic properties of weak islands (as factive islands are generally understood), we need adjunct extraction data. This is the purpose of Experiment 2.

3. Experiment 2: Adjunct extraction

3.1. The goal of the experiment

The goal of the experiment was twofold. First, it tested whether factive and nonfactive clauses differ with respect to adjunct extraction, which provides the clearest case for the islandhood of factive clauses, according to the literature (e.g., [Hegarty 1992; Haegeman 2012]).

¹³ Interestingly, while [Knyazev 2023] also found a significant effect of nominalization for both predicate classes, the difference between argument extraction from bare nonfactive vs. factive clauses did not reach significance in that study, despite the numerical trend, and also the fact that three out of four factive predicates showed a clear contrast from nonfactive predicates with respect to extraction from bare clauses. Note, however, that [Knyazev 2023] had only one sentence set per predicate, as opposed to two in the present study. Therefore, it is possible that the null result in that study reflects lack of power to detect the true effect.

As in Experiment 1, both bare and nominalized clauses were compared. This addresses Question 1 in (5a) and Question 4 in (5d).

The second goal was to compare argument extraction and adjunct extraction. As was discussed in *Section 2.1*, this was done mainly indirectly, by comparing extraction from bare and nominalized clauses. If factive clauses are weak islands, adjunct extraction from them should lead to a more severe violation compared to argument extraction. In relative terms, this may result in the disappearance of the contrast between extraction from bare and nominalized clauses (observed in Experiment 1) due to the additional cost of adjunct extraction for weak islands. There is a similar prediction for nonfactive clauses provided they too are weak islands in Russian. This addresses Questions 2–3 in (5b)–(5c).

3.2. Design and materials

The design of the experiment was similar to Experiment 1 except that the extraction conditions involved extraction of the PP adjunct of the embedded verb, as shown in (13c)–(13d) for nonfactive predicates and in (14c)–(14d) for factive predicates (cf. baseline/no extraction conditions in (13a)–(13b) and (14a)–(14b), respectively).

- (13) a. *Ona nadeetsja, čto ee muž budet lečit' zuby v ètoj klinike.*
 'She hopes that her husband will be treating his teeth in this clinic.'
 [NON-FACTIVE | NO EXTRACTION | BARE]
- b. *Ona nadeetsja na to, čto ee muž budet lečit' zuby v ètoj klinike.*
 'She hopes that her husband will be treating his teeth in this clinic.'
 [NON-FACTIVE | NO EXTRACTION | NOMINALIZED]
- c. *Klinika, [v kotoroj]_i ona nadeetsja, čto ee muž budet lečit' zuby ___j, naxoditsja v drugom rajone.*
 'The clinic in which she hopes that her husband will be treating his teeth is located in a different district.'
 [NON-FACTIVE | EXTRACTION | BARE]

- d. *Klinika*, [v *kotoroj*]_i; *ona nadeetsja na to, što ee muž budet lečit' zuby* ___i; *naxoditsja v drugom rajone*.
 'The clinic in which she hopes that her husband will be treating his teeth is located in a different district.'
 [NON-FACTIVE | EXTRACTION | NOMINALIZED]
- (14) a. *Mat' žaleet, što v blanke dlja otvetov rebenok pereputal polja*.
 'The mother regrets that her child has mixed up the answer fields in the answer sheet.'
 [FACTIVE | NO EXTRACTION | BARE]
- b. *Mat' žaleet o tom, što v blanke dlja otvetov rebenok pereputal polja*.
 'The mother regrets that her child has mixed up the answer fields in the answer sheet.'
 [FACTIVE | NO EXTRACTION | NOMINALIZED]
- c. *Blank dlja otvetov*, [v *kotorom*]_i; *mat' žaleet, što rebenok pereputal polja* ___i; *vydavalsja v odnom èkzempljare*.
 'The answer sheet in which the mother regrets that her child has mixed up the answer fields was handed out in one copy.'
 [FACTIVE | EXTRACTION | BARE]
- d. *Blank dlja otvetov*, [v *kotorom*]_i; *mat' žaleet o tom, što rebenok pereputal polja* ___i; *vydavalsja v odnom èkzempljare*.
 'The answer sheet in which the mother regrets that her child has mixed up the answer fields was handed out in one copy.'
 [FACTIVE | EXTRACTION | NOMINALIZED]

As in Experiment 1, in half of the sentences with extraction the head of the relative clause was the matrix subject, as in (13)–(14), and in the other half a non-subject argument¹⁴. (See the full list in the Appendix.)

¹⁴ An example with a non-subject head is given is (i).

- (i) *On razbil mašinu*, [na *kotoroj*]_i; *ona byla uverena (v tom), što oni poedut* ___i; *v otpusk*.
 'He smashed up the car in which she was certain that they will go on vacation.'

When constructing the experimental sentences, a special care was taken to ensure that the matrix construal of the adjunct phrase was implausible and the embedded construal was highly preferred (at least in a zero context). For example, a matrix construal in (13c) would involve a paraphrase such as ‘she is hoping inside some clinic that her husband will treat his teeth’, which is clearly less likely than the intended construal.

The experiment used the same four factive and four nonfactive predicates as in (8). The construction of experimental materials and the composition of experimental lists followed the same procedure as Experiment 1, with the same number of experimental sentences and fillers.

The only difference was that all fillers with extraction used sentences with extraction of verbal PP adjuncts to match those in the experimental sentences, as shown in (15a) for extraction from a complex NP and in (15b)–(15c) for extraction from a *čtoby*-clause and a *čo*-clause with *dumat* ‘think’ / *predpolagat* ‘suppose’, which served as acceptable baselines for long-distance extraction.

- (15) a. **Žurnalist nazval summu*, [*na kotoruju*]_i, *napadajuščij otverg predloženie o tom, čtoby klub povysil ego zarplatu* ___i.
Intended: ‘The journalist named the amount by which the striker rejected a suggestion that the club should increase his wages’
- b. *Rjukzak*, [*s kotorym*]_i, *ona xočet, čtoby muž vstretil ee na vokzale* ___i, *dyrjavjy*.
‘The backpack with which she wants her husband to meet her at the station has a hole in it.’
- c. *Park*, [*v kotorom*]_i, *ona dumaet, čo oni budut igrat’ v nastol’nyj tennis* ___i, *sejčas zakryt*.
‘The park in which she thinks they will play table-tennis is closed now.’

3.3. Procedure, participants and analysis

The procedure and analysis was the same, as in Experiment 1. Fifty two participants submitted the results; of these the results of 44

participants were analyzed whose average rating of acceptable fillers was larger than the average of both unacceptable fillers with selectional violations and sentences with extraction from complex NPs¹⁵. The mean of the participants was 36.6 with the standard deviation of 8.2 (the gender information was not collected).

3.4. Results

3.4.1. Fillers

The results for the fillers, given below in *Table 4*, were fairly similar to Experiment 1, with participants clearly distinguishing acceptable and unacceptable fillers¹⁶.

Table 4. Mean raw and z-score rating with standard error by filler type (Experiment 2)

filler type	mean raw rating (SE)	mean z-score rating (SE)
acceptable	5.85 (0.04)	0.69 (0.04)
extraction: <i>čtoby</i> -clauses	3.76 (0.11)	-0.27 (0.08)
extraction: <i>čto</i> -clauses	4.41 (0.10)	0.05 (0.08)
unacceptable: selection	2.89 (0.07)	-0.66 (0.05)
unacceptable: complex NP	2.61 (0.12)	-0.77 (0.07)

But there were also two differences. First, sentences with extraction from a complex NP (cf. (15a)) received a slightly higher rating compared

¹⁵ Sentences with extraction from *čtoby*-clauses such as (15b) were not used to exclude participants (unlike in Experiment 1) because that would have excluded too many participants given that such sentences, for unclear reasons, received ratings below the midpoint (see next section).

¹⁶ One problematic filler with a selectional violation (see footnote 11) had the mean raw rating of 4.36 (z-score: 0.01), which was again considerably higher compared to others, ranging from 2.16 (-0.99) to 2.95 (-0.63). Excluding this filler, the mean rating of the unacceptable fillers becomes 2.60 (-0.79).

to Experiment 1, close to selectional violations (see footnote 16). Second and more importantly, sentences with extraction from *čtoby*-clauses (cf. (15b)) received a lower rating than expected, below the midpoint, and were also on average rated lower than fillers with extraction from *čto*-clauses (cf. (15c)), although this contrast was not consistent across all the items (see Appendix for the by-item mean ratings). Although the reasons for this divergence are not fully clear, I suggest that it does not invalidate the results of the experiment but instead can be attributed to item-specific effects. Consider the filler in (19), which received an unexpectedly low rating (raw: 3.22; z-score: -0.51), largely accounting for the lowering of the average rating of the relevant condition.

- (16) *Ona ne moŽet najti magazin, [v kotorom]_i on prosit, čtoby ona kupila ovošči ___i.*
 ‘She cannot find the shop where he asks her to buy vegetables.’

It is plausible that this filler may have induced a “garden path” effect despite the fact that it was constructed in such a way as to favor the embedded interpretation. That is, participants may have originally attached the PP to the matrix verb but later backtracked to the intended interpretation (or perhaps stuck with this implausible interpretation), which would be reflected in the decreased rating. Assuming that plausibility considerations in constructing the materials were unable to fully eliminate the possibility of matrix attachment and further assuming that such possibility was modulated by some unknown property P of the items, it is possible that P has obscured the expected contrast between *čto*- and *čtoby*-clauses. The same concern of course arises for the experimental sentences. However, because there were more items per condition (i.e., 8 instead of 2), it becomes less likely that P was disproportionately present with factives or nonfactives (assuming that P is independent of factivity), suggesting that it should not have distorted the results.

3.4.2. Experimental sentences

The results for the experimental sentences are given in *Table 5* and *Figure 2*.

Table 5. Mean raw and z-score rating by predicate class, sentence type and complement type (Experiment 2)

predicate class	sentence type	complement type	mean raw rating (SE)	mean z-score rating (SE)
nonfactive	no extraction	bare	6.49 (0.05)	0.98 (0.07)
		nominalized	6.53 (0.05)	1.01 (0.05)
	extraction	bare	3.98 (0.11)	-0.17 (0.09)
		nominalized	3.92 (0.11)	-0.16 (0.08)
factive	no extraction	bare	5.95 (0.08)	0.73 (0.07)
		nominalized	6.23 (0.06)	0.87 (0.06)
	extraction	bare	2.35 (0.11)	-0.91 (0.07)
		nominalized	2.32 (0.12)	-0.93 (0.07)

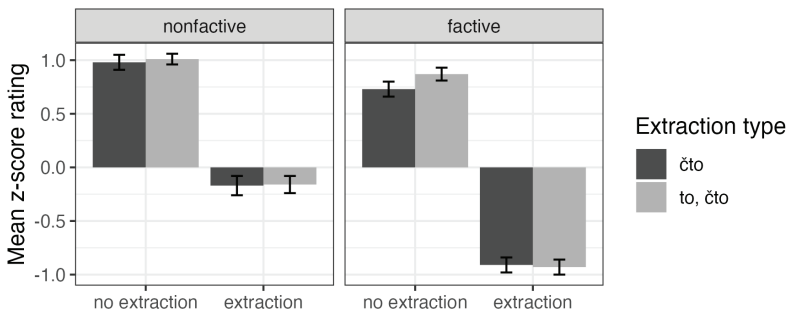


Figure 2. Mean raw and z-score rating by condition (Experiment 2)

We can immediately see that there is no contrast between extraction from bare and nominalized clauses, irrespective of factivity. At the same time, there is a strong contrast between extraction from factive and nonfactive clauses, such that the latter are close to the midpoint (-0.17 and -0.16, for bare and nominalized clauses respectively), whereas the former are clearly unacceptable (-0.91; -0.93).

This result is supported by the statistical analysis. The model showed a significant effect of extraction ($\beta = -1.14$, $SE = 0.15$, $p < 0.001$), as expected.

It also showed a significant effect of factivity such that in the baseline condition (bare) factive clauses were rated as slightly less acceptable compared to nonfactive clauses ($\beta = -0.24$, $SE = 0.09$, $p = 0.009$). The latter effect mostly likely arises due to somewhat lower ratings for certain experimental items (cf. the by-verb results in *Table 6* below) and is not particularly meaningful, especially given that it was not observed in Experiment 1¹⁷.

Crucially, there was an interaction between factivity and extraction such that extraction from (bare) factive clauses was rated lower compared to nonfactive clauses ($\beta = -0.50$, $SE = 0.21$, $p = 0.03$). Note that this interaction takes into account the difference between the baseline conditions, i.e., it shows that the contrast in extraction was driven by the extraction conditions. The interaction between nominalization and extraction ($\beta = -0.05$, $SE = 0.09$, $p = 0.70$) was not significant. And neither was the interaction between factivity, nominalization and extraction ($\beta = -0.10$, $SE = 0.19$, $p = 0.60$). The lack of the three-way interaction suggests that the interaction between factivity and extraction was observed for both bare and nominalized clauses, which was confirmed by the latter interaction in a simpler model for nominalized clauses ($\beta = -0.60$, $SE = 0.22$, $p = 0.02$). It also suggests that nominalization did not interact with extraction for factive clauses, which was confirmed by the lack of interaction in a simpler model for factive clauses ($\beta = -0.15$, $SE = 0.13$, $p = 0.27$).

3.4.3. Results for the individual predicates

The results broken down by the predicate are shown in *Table 6* (p. 387).

The by-predicate results largely conform to the general pattern. Thus, extraction from nominalized clauses does not show clear degradation

¹⁷ Specifically, the effect was presumably driven by items 9 (with *žalet* ‘regret’) and 14 (with *udivljat’sja* ‘be surprised’), which received ratings of 5.17 (z-score: 0.39) and 5.08 (0.46) in the baseline condition (see the Appendix). Why these particular sentences were rated relatively lower is unclear. The text suggestion that the effect is accidental is supported by the fact that once the relevant sentences are removed, the effect loses statistical significance ($\beta = -0.13$, $SE = 0.1$, $p = 0.20$). I thank the reviewer for drawing my attention to this effect.

Table 6. Mean z-score rating by predicate, sentence type and complement type (Experiment 2)

predicate class	Predicate	no extraction		extraction	
		<i>čto</i>	<i>to, čto</i>	<i>čto</i>	<i>to, čto</i>
nonfactive	<i>nadejat'sja</i> 'hope'	1.04	1.11	0.03	-0.01
	<i>uveren</i> 'certain'	0.98	1.07	-0.07	-0.22
	<i>rasčityvat</i> 'count on'	0.88	0.99	-0.27	-0.21
	<i>namekat</i> 'hint'	1.01	0.89	-0.34	-0.19
factive	<i>žalet</i> 'regret'	0.62	0.82	-0.61	-0.43
	<i>rad</i> 'glad'	0.80	0.82	-0.96	-1.02
	<i>udivljat'sja</i> 'be surprised'	0.67	0.98	-1.26	-1.19
	<i>gordit'sja</i> 'be glad'	0.88	0.84	-0.83	-1.07

relative to bare clauses, with the possible exception of *gordit'sja* 'be glad' and to a lesser extent *uveren* 'certain' (cf. Experiment 1 in *Table 4*). As for the contrast between predicate classes, extraction from bare clauses with all 4 factive predicates was clearly lower compared to nonfactive predicates.

3.5. Discussion

The experiment replicated the contrast between extraction from factive and nonfactive clauses with respect to adjunct extraction that was observed with argument extraction in Experiment 1. As in Experiment 1, the contrast was replicated for both bare and nominalized clauses. The main difference from Experiment 1 is that there was no contrast between extraction from bare and nominalized clauses, for both predicate classes. In view of the logic of the experimental test (see *Section 3.1*), this may give the impression of supporting the notion that adjunct extraction is less acceptable than argument extraction, which would result in the leveling of the difference between bare and nominalized clauses with respect to extraction. However, this interpretation is not supported by the data.

Adjunct extraction from nonfactive clauses was rated slightly below the midpoint of the scale (bare/nominalized: $-0.17 / -0.16$), suggesting that such extraction is at best only mildly degraded, which would be unexpected if adjunct extraction were qualitatively worse compared to argument extraction. In fact, if we compare this with the results of Experiment 1 adjunct extraction was rated **higher** than argument extraction ($-0.40 / -0.71$). This suggests that the levelling of the contrast between adjunct extraction from bare and nominalized clauses was due to **amelioration** for adjunct extraction from nominalized clauses rather than a disadvantage of adjunct extraction from bare clauses (I develop this idea below). Note that the higher rating for adjunct compared to argument extraction (with nonfactive) cannot be simply dismissed as the result of an unintended parse whereby the adjunct is attached to the matrix clause as that would leave unexplained why adjunct extraction from factive clauses was strongly degraded (under the natural view that the possibility of a matrix parse should not depend on factivity)¹⁸.

As for factive clauses, although the results in principle do not exclude the possibility that adjunct extraction is worse compared to argument extraction the difference for the bare conditions was rather weak (-0.91 vs. -0.82) and may well be driven by the slight dispreference for bare factive clauses in the baseline condition (see *Figure 2*), whereas in the nominalized conditions adjunct extraction was, again, rated higher, rather than lower, compared to argument extraction (-0.93 vs. -1.06).

The reviewer raises an important question whether it is appropriate to compare the results of the two experiments given that they had different sets of participants, as well as nonidentical, albeit structurally and lexically similar, fillers (except for 6 fillers with selectional violations and 2 practice

¹⁸ This is not to say that the possibility of matrix attachment does not play a role. Instead, I conjecture that comprehenders always or nearly always entertain such a parse initially but later backtrack from it in favor of the embedded attachment, provided the complement allows it (to some extent). (See also the discussion at the end of *Section 3.4.1*). These issues no doubt require further study.

items)¹⁹. I believe this is not a serious concern and the comparison is justified. First, the participants were drawn from the same population of speakers using the same criteria (workers of Toloka based in Russia, etc.), with a rather small interval between the two experiments (2.5 months). Second, the overall procedure of the two experiments (including presentation of the items, instructions, etc.) was the same. Third, and most importantly, we see a very high correlation between the ratings of the fillers across the two experiments ($r(18) = 0.92$, $p < 0.001$), which is not surprising given the overall similarity between the fillers across the two experiments (see *Section 3.2*). This suggests that the fillers were perceived in roughly the same way across the experiments and thus should not have influenced the results (e.g., by causing participants to systematically shift their ratings of the experimental items towards the upper or lower end of the scale).

To make the comparison between argument and adjunct extraction more obvious, I present the results of the two experiments side by side, as in *Figure 3* (p. 390). As we can see, there is no clear disadvantage for adjunct extraction in any of the four conditions. Instead, we see a surprising advantage with nominalized nonfactive clauses and, to a lesser extent, with bare nonfactive condition, whereas factive clauses do not show a clear advantage for either type of extraction.

To further examine the difference between the two experiments, I analyzed the pooled data, separately for each predicate class. The pooled model involved an additional factor (experiment/extraction type, with argument extraction as baseline), besides complement type (bare vs. nominalized) and sentence type (no extraction vs. extraction).

The model for nonfactive clauses showed an effect of (argument) extraction ($\beta = -1.33$, $SE = 0.09$, $p < 0.001$) and also an interaction between nominalization and (argument) extraction ($\beta = -0.36$, $SE = 0.12$, $p = 0.002$), which simply replicates what we observed in the analysis of Experiment 1²⁰. What is more important is that there was a marginally

¹⁹ Specifically, the nonidentical fillers had the same combination of the matrix predicate and complement type, as well as partially overlapping lexical content (see *Section 3.2*).

²⁰ This model had item, subject, by-item slopes for experiment type and complement type, as well as by-subject slope for sentence type as random effects.

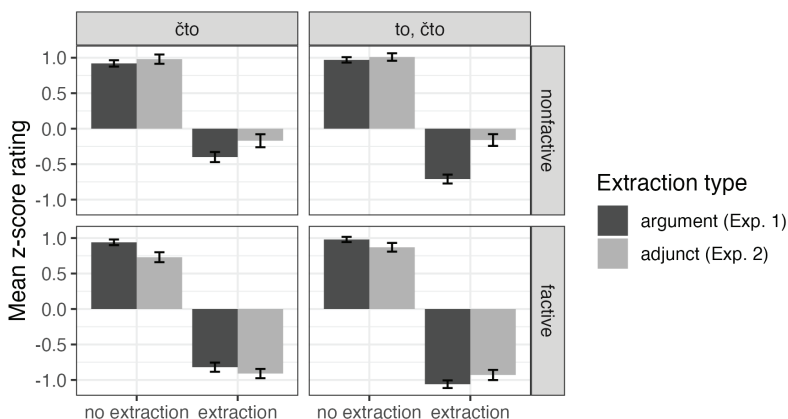


Figure 3. The condition means (and standard errors) from Experiments 1 and 2 together

significant interaction between experiment type, nominalization and extraction ($\beta = 0.31$, $SE = 0.17$, $p = 0.07$), suggesting that the effect of nominalization (observed in the argument extraction condition) was largely cancelled in the adjunct extraction condition, presumably due to the amelioration effect mentioned above (note the positive coefficient for the interaction term)²¹. This interaction is visually reflected in the fact that while the downward-looking dark bar on the left is lower than the one on the right in the upper panels of *Figure 3*, the contrast is not observed for the corresponding light bars. Interestingly, the same model did not show an interaction between experiment type and extraction ($\beta = 0.19$, $SE = 0.14$, $p = 0.17$), suggesting that while adjunct extraction from bare clauses was numerically more acceptable compared to argument extraction (cf. the dark downward-looking bar being slightly lower than the corresponding

²¹ A simpler model for extraction (from nonfactive clauses) showed a similar effect of nominalization ($\beta = -0.31$, $SE = 0.12$, $p = 0.02$) and a marginally significant interaction between adjunct extraction and nominalization ($\beta = 0.30$, $SE = 0.17$, $p = 0.09$). The effect of adjunct extraction (from bare clauses) was not significant ($\beta = 0.24$, $SE = 0.20$, $p = 0.24$).

light one in the left upper panel of *Figure 3*), this difference was not statistically significant²².

The model for factive clauses showed an effect of (argument) extraction ($\beta = -1.76$, $SE = 0.08$, $p < 0.001$) and an interaction between nominalization and (argument) extraction ($\beta = -0.27$, $SE = 0.11$, $p = 0.01$), which replicates the analysis of Experiment 1²³. There was also a marginally significant effect of experiment type ($\beta = -0.20$, $SE = 0.11$, $p = 0.06$) such that baseline sentences with bare clauses in the adjunct extraction experiment were rated lower compared to the argument extraction experiment. The effect is difficult to interpret and may be an artefact or reflect specific features of the experimental items (see *Section 3.2*). More importantly, just like with nonfactive clauses, there was no interaction between experiment type and extraction ($\beta = 0.11$, $SE = 0.12$, $p = 0.36$), suggesting that adjunct extraction (from bare clauses) was rated similarly to argument extraction, in fact, there was a numerical trend in the opposite direction, as shown by the positive coefficient. (This trend arises because of the larger contrast in the baseline condition since in the extraction conditions adjuncts show slightly lower acceptability, as can be seen from left lower panel of *Figure 3*.) The interaction between experiment type, nominalization and extraction was not significant ($\beta = -0.14$, $SE = 0.16$, $p = 0.38$). This might look as if nominalization interacted with extraction similarly for both adjunct and argument extraction. However, as we know from the analysis of Experiment 2 (see *Section 3.4.2*), nominalization did not modulate adjunct extraction, which indicates that the combined model simply failed to find a true difference.

How can we interpret the results of Experiment 2 in light of the results of the pooled analysis? The most important conclusion is that there was no evidence of adjunct extraction leading to a more severe violation. If anything, there was an opposite trend for adjunct extraction to be more acceptable compared to argument extraction. Interestingly, a similar advantage for adjunct over argument extraction was observed by [Demina 2021]

²² Other effects and interactions were not significant.

²³ The model had item, subject, by-item slope for complement type as well as by-subject slope for sentence type as random effects.

in experiments testing extraction from *wh*-questions, which are also usually considered weak islands²⁴.

The trend towards advantage for adjunct extraction was most pronounced with nominalized nonfactive clauses, as we saw in the (marginally significant) positive coefficient of the three-way interaction in the model above, which had the effect of cancelling the aggravating effect of nominalization with adjuncts. It is further reflected in a significant interaction between experiment type and extraction in a separate model for nominalized nonfactive clauses ($\beta = 0.50$, $SE = 0.11$, $p < 0.001$). We can see this clearly in the large contrast between the dark and the light downward-looking bars in the upper left panel of *Figure 3*. The same numerical trend is observed in the other three conditions (cf. the positive, though not significant, coefficient of the interaction between experiment type and extraction in the models for nonfactive and factive clauses above; and a similar, and even larger, trend in a separate model for nominalized factive clauses: $\beta = 0.25$, $SE = 0.18$, $p = 0.19$). Although this trend did not reach significance in these three conditions, in view of its significance for nominalized nonfactive clauses, as well as its consistency across all the conditions, I interpret it as non-accidental and tentatively attribute the non-significant results to independent factors, as will be explained below.

What is the nature of this trend towards higher acceptability of adjunct, compared to argument, extraction, and why was it more pronounced with nominalized nonfactive clauses? I would like to suggest the following processing explanation (see also [Demina 2021] for a sketch of a syntactic explanation). It is well-known (e.g. [Cinque 1990; Rizzi 1990]) that extraction is more acceptable for complex *wh*-phrases (sometimes called D-linked) such as *which student* as opposed to bare *wh*-phrases such as *who*. This effect is often thought of as ameliorating specifically weak island violations (e.g., by way of adding some discourse-related feature

²⁴ Interestingly, [Demina 2021] did not observe the adjunct over argument advantage with extraction from (bare nonfactive) *čto*-clauses. Note, however, that it is difficult to directly compare the present results with those of Demina as she tested *wh*-interrogative, as opposed to relative clause dependencies, and also used only prototypical nonfactive predicates *sčitat* ‘believe’ and *dumat* ‘think’ in the respective condition.

to the filler and thereby avoiding intervention for Relativized Minimality; see below). However, there is also experimental evidence that it facilitates processing of filler-gap dependencies in general, including extraction from non-islands [Hofmeister, Sag 2010; Goodall 2015], the idea being that by virtue of having richer content more complex fillers lead to more activation in memory and are thereby easier to retrieve at the gap position.

What I wish to suggest is that PPs with locative, temporal, comitative and other adverbial meanings that were used in Experiment 2, e.g., *na kotoroj* ‘on which (FEM.SG)’, also have richer semantic content (for the purposes of maintaining the filler-gap dependency) compared to accusative-marked relative pronouns such as *kotoruju* ‘which_{ACC} (FEM.SG)’ used in Experiment 1. As a consequence, they should be easier to process, which would account for the facilitation effect for adjunct extraction.

The fact that this facilitation effect was stronger in the presence of nominalization also makes sense from processing considerations. It has been noted in the literature that referential processing (i.e., processing of referents that are specific) inside filler-gap dependencies may create additional difficulty for comprehenders, the reason being that identification of such referents in working memory (e.g., *the girl*) may diminish the activation of the filler [Kluender 1992; Hofmeister, Sag 2010]. This idea has been used to explain, e.g., why definiteness reduces acceptability of extraction from picture-NPs, as in (17a), cf. (17b), and also from complex NPs, as in (18a), cf. (18b).

- (17) a. *Who_i did you see [pictures of ___i]? >*
 b. *Who_i did you see [**the pictures** of ___i]? >*

- (18) a. *This is the paper_i that we really need to find [someone [who understands ___i]]. >*
 b. *This is the paper_i that we really need to find [**the linguist** [who understands ___i]].*

[Kluender 1992: 238]

Given that processing of filler-gap dependencies across referential expressions has an extra cost (above and beyond the cost of referential processing as such), in statistical terms leading to the interaction between

the presence of such expressions and extraction, this implies that weakening of one of the factors (i.e., the cost of maintaining/retrieving the filler) by amount x should result in an overall effect greater than x [Goodall 2015: 3]. This, the facilitating effect of semantic complexity will be stronger in the presence of an intervening referential structure.

Now, assuming that Russian *to*, *čto*-clauses are, at least in some of their uses, (familiar) definite expressions referring to a proposition given in the discourse we expect that they should also cause additional processing difficulty and thus, given the logic above, will lead to a larger amelioration effect from nominalized clauses compared to bare clauses. (Note that this is independent of whether *to*, *čto*-clauses are associated with a separate island constraint, although it would be in the spirit of this account not to posit such a constraint; see *Section 4*.)

To account for why the amelioration effect was weaker with factive clauses, we may assume that amelioration is diminished when the difficulty of constructing the dependency becomes too high [Phillips 2013: 71–72]. As we saw, argument extraction from factive clauses is considerably degraded and while in absolute terms extraction from bare factive clauses does not differ from argument extraction from nominalized nonfactive clauses, the latter sentences may have an extra benefit provided by the fact that they are synonymous with sentences with extraction from bare nonfactive clauses, which is only mildly degraded. To the extent that this should render extraction from nominalized nonfactive clauses more comprehensible and thereby facilitate processing (see, e.g., [Beltrama, Xiang 2016]), we should expect nonfactive clauses to show a stronger amelioration effect compared to factive clauses.

To summarize, the adjunct effect was strongest for nominalized nonfactive clauses where it was able to cancel the effect of nominalization and led to a visible advantage of adjunct over argument extraction. In the two bare conditions, especially with factive clauses, adjunct advantage was not sufficiently strong to lead to a significant effect. In the nominalized factive condition the effect was also not strong enough to lead to a significant adjunct advantage. However, importantly, it may have been sufficient to eliminate the effect of nominalization. Indeed, on the basis of argument extraction we can estimate the effect of nominalization

for factive clauses as -0.25 , whereas the observed nominalization effect for adjunct extraction was -0.15 (see *Section 3.4.2*). Now, given that adjunct advantage for nominalized factive clauses was $+0.25$ and so the acceptability of extraction from nominalized factive clauses was increased by that amount, by reasoning counterfactually, we can conclude that if adjunct advantage had not been present, then the acceptability of the latter condition would be decreased by -0.25 , rendering the effect of nominalization -0.40 ($= -0.15 + (-0.25)$), which should have been sufficient for a significant interaction between nominalization and extraction.

To conclude this section, the experiments showed that factive clauses are less transparent for extraction compared to nonfactive clauses, replicating the results of Experiment 1. At the same time, there was no evidence of adjunct extraction being less acceptable compared to argument extraction, which is characteristic of weak islands. Instead, the results of the pooled analysis showed a numerical (and in the case of nominalized nonfactive clauses significant) advantage for adjunct over argument extraction, partially replicating previous findings [Demina 2021]. It was hypothesized that this advantage may have completely eliminated the aggravating effect of nominalization (which was observed with argument extraction) in the case of adjunct extraction, accounting for an otherwise puzzling difference between the two experiments.

4. General discussion and conclusion

The main question this study addressed was whether factive clauses behave as islands in Russian, as distinct from nonfactive clauses. It also tested the dominant view that factive islands are weak islands in the sense of disallowing some types of extractions but allowing others (or perhaps disallowing them to a lesser extent), with reference to the argument/adjunct distinction. The latter question was also investigated with respect to nonfactive *čto*-clauses, which are sometimes described as weak islands in Russian [Bailyn 2020]. Finally, it tested whether nominalized clauses in Russian are indeed strong islands, as standardly assumed, and whether

the strength of the violation incurred by them depends on factivity and on the extracted element being an adjunct (in case factive or nonfactive bare clauses are independently weak islands).

The main positive result of the experiments is a systematic effect of factivity such that factive clauses on average lead to less acceptable extractions. The effect was found with both bare and nominalized clauses, as well as with both argument and adjunct extractions. In this sense, the study supports the existence of the factive island in Russian. It is important to emphasize, however, that this effect of factivity is rather a strong tendency as we saw some variation among predicates²⁵.

The second positive result is that there was an effect of nominalization reducing the acceptability of extraction, both with nonfactive and factive clauses alike. We saw it directly with argument extraction in Experiment 1. I also hypothesized that nominalization similarly affects adjunct extraction despite the fact we cannot directly observe this. To reiterate, the argument was as follows: if there had been no advantage for adjunct, compared to argument, extraction with nominalized clauses (especially with nonfactive clauses), we would have observed the effect of nominalization with adjunct extraction, just like in the case of argument extraction.

I will not attempt here to provide an explanation for the aggravating effect of clausal nominalization on extraction in Russian. It may be due to definite DPs being islands in general, whether strong or weak [Pereltsvaig 2007; Lyutikova 2010; Kastner 2005]. Alternatively, it could be due to some general principle such as Anti-Locality banning extraction specifically from DP-CP structures [Bondarenko 2022]. It could also be a processing effect [Kluender 1992; Hofmeister, Sag 2010], as was alluded to above.

The two positive results above are best captured, in a rather descriptive fashion, by two gradient (soft) constraints (a.o., [Sorace, Keller 2005]) interacting cumulatively, given in (19)²⁶.

²⁵ For more on some problematic aspects of factive predicates as a uniform class with respect to presuppositionality-related diagnostics see [Degen, Tonhauser 2022].

²⁶ There are also “hard” constraints such as violations of subject-verb agreement and perhaps selectional violations, each of which is supposed to be sufficient to lead to full unacceptability [Sorace, Keller 2005].

- (19) a. *FACT-EXTR: Extraction from factive clauses is disallowed.
b. *NOM-EXTR: Extraction from nominalized clauses is disallowed.

This implies that each constraint reduces the acceptability of the sentence by some measure (depending on the strength of the constraint) and also that the cost of violations additively combines to yield the observed acceptability. As a consequence of this view, the simplistic characterization of nominalized clauses as “strong” islands in the sense of categorically blocking extraction should be rejected in favor of a more nuanced view where extraction from nominalized clauses can be modulated by factivity (and potentially other factors).

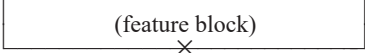
The most important negative result is that there was no evidence for argument/adjunct asymmetry, which is a traditional diagnostic for weak islandhood, neither for factive nor nonfactive clauses. Instead, there was an advantage for adjunct extraction, especially with nominalized nonfactive clauses, which, as I have argued, is a processing facilitation effect. Because this effect played an important role, I formulate it separately in (20).

(20) **Adjunct extraction advantage**

PP adjunct fillers are easier to process compared to (accusative) argument fillers due to their richer semantic content.

The question arises: in view of the lack of argument/adjunct asymmetry, can the weak island analysis of factive clauses be upheld for Russian and what theories of weak islands are compatible with it? I will not provide a comprehensive discussion of theories of weak islands in this paper. Instead, I will limit myself to a brief overview of one prominent syntactic approach (and especially relevant as it is used by [Bailyn 2020] in his discussion of *čto*-clauses), namely featural Relativized Minimality, and make only passing remarks about formal semantic approaches, as well as “functionalist” approaches (discourse- and frequency-based).

Under featural Relativized Minimality (fRM) [Rizzi 2004; Villata et al. 2016], the paradigm case of a weak island is a *wh*-island created by an indirect question, as schematically represented in (21).

- (21) $C_{[+Q(wh)]} [YP_{[+Q(wh)]} [\dots XP_{[+Q(wh)]} \dots]]$ [Bailyn 2020: 651]


The crucial property of wh-islands (YP) is that they carry the [+wh] feature. The island violation arises as an intervention effect due to the fact that the [+wh] feature on the wh-island disrupts the wh-dependency between the C-head attracting the wh-phrase from its gap position to [Spec,CP]. More precisely, the intervention is caused by the fact that the relevant [+wh] feature belongs to the class of quantificational features [+Q]. (This explains why non-wh elements like focus, measure phrases, etc., which may be viewed as quantificational also cause intervention effects; see [Rizzi 2004, Abels 2012] for details.)

This general idea was extended to factive islands in English in [Haegeman, Ürögdi 2010], who argue that factive clauses also carry quantificational features by virtue of having the null event operator in the embedded [Spec,CP], as shown in (22), the idea being that such clauses involve relativization of the event variable corresponding to the operator (Op) and located in some functional projection (FP) above the TP.

- (22) $[_{CP} Op_i C \dots [_{FP} t_i [_{TP} \dots]]]$ [Haegeman, Ürögdi 2010:115]

This explains why factive clauses normally disallow wh-interrogative extraction, as we saw in (1b). To explain “exceptional” extraction with argumental wh-phrases (1c) and especially with complex argumental wh-phrases as in (23), Haegeman and Ürögdi capitalize on the idea that argumental phrases carry an additional discourse-related feature (δ) (or at least are more easily construed as carrying this feature), which renders intervention partial, as represented in (24) (see [Cinque 1990; Rizzi 1990] for the role of referentiality/D(iscourse)-linking in facilitating extraction from weak islands)²⁷.

²⁷ In other accounts, e.g., [Villata et al. 2016], the special status of complex wh-phrases such as *which student* has to do with an additional [+N] feature (due to the presence of a nominal restriction).

- (27) [*the book*]_i *which the journalist doesn't remember who wrote* ____i
[Bailyn 2020: 657]
- (28) ... *no te devuški, kotoryx ja ljublju, vse pogolovno v takoj kolossal'noj bede, [iz kotorj]_i, ja ne znaju, kto mozet ix vytaščit'* ____i.
'... but the girls I love are all in such colossal trouble that I don't know who can get them out of it'
[Ljutikova 2019: 25]

Both Haegeman and Ürögdi's and Bailyn's approaches predict no argument/adjunct asymmetry for relative extraction, as was indeed observed in the experiments. At the same time, Haegeman and Ürögdi's approach may fit the results of the experiments better. This is because Bailyn's approach does not predict any additional degradation for relative (or interrogative) extraction from factive compared to nonfactive clauses, which was in fact observed, whereas Haegeman and Ürögdi **does** potentially predict this difference for relative extraction, if combined with the view that **partial** intervention (caused by the match between the extracted element and the potential intervener in the feature [+Q(wh)]; see (24)) translates into (partially) reduced acceptability [Villata et al. 2016]²⁹.

At the same time, Haegeman and Ürögdi do not predict any degradation for extraction from nonfactive clauses in Russian as compared to English (unlike Bailyn, who predicts it at least for wh-interrogative extraction). However, whether fRM-based accounts of the factive island succeed ultimately depends on the existence of **positive** evidence from argument/adjunct asymmetry (i.e., argument over adjunct advantage), as supposedly found in wh-interrogative extraction (but see [Demina 2021],

²⁹ It is not clear to me whether the system in [Bailyn 2020] is compatible with partial intervention (in the sense above) for relative extraction with other potential weak islands, e.g., wh-islands, given his feature geometry (see [Abels 2012; Ljutikova 2019] for further discussion). Note also that, unlike [Villata et al. 2016], neither of the fRM-based accounts cited above, including [Haegeman, Ürögdi 2010], make a theoretical distinction between cases where the features of the extracted element *properly include* the features of the potential intervener (i.e., cases of partial intervention for [Villata et al. 2016]) and cases where the relevant features are *disjoint* and no intervention is caused.

which did not find such evidence). Because the present experiments did not test *wh*-interrogative extraction, the results are at best compatible with such accounts but do not provide supporting evidence for them.

I cannot discuss semantic approaches to weak islands here (e.g., [Abrusán 2014]; see also [Szabolcsi, Lohndal 2017] for an overview), the main problem with such approaches is that they are usually designed to capture the ban on extraction for very specific types of adjuncts such as manner *wh*-words like *how* or degree expressions like *how many*, building on their special semantic properties, more precisely, the logical structure of the corresponding domains in which they denote (i.e., the domain of manners, degrees, etc.), as opposed to more usual individual-denoting *wh*-phrases such as *what* or *who*³⁰. Thus, it is not immediately clear how such approaches can account for the degradation of extraction with the latter kind of phrases, which we observed in the experimental results³¹. More recent semantic approaches to factive islands such as [Schwarz, Simonenko 2018] may be more promising as they link the semantic anomaly arising with extraction from factive islands to the uniqueness/non-iterability of the extracted element, regardless of whether it denotes in the domain of individuals or some other domain. While discussion of this and related approaches is beyond the scope of this paper, it must be pointed out that they are focused on *wh*-interrogative extraction and therefore it remains to be seen whether they carry over to relative extraction.

In recent years, there have also been a number of discourse-based [Ambridge, Goldberg 2008] (see also [Goldberg 2013]) and frequency-based

³⁰ For example, according to [Abrusán 2014: 41–43], extraction of *how* from factive clauses like *Mary regrets that John fixed the car* is semantically anomalous because factive clauses presuppose that for every manner the attitude holder believes that the embedded proposition holds of that manner. Crucially, since the domain of manners always includes contraries (e.g., ‘fast’ and ‘slowly’), such extraction presupposes a contradictory set of beliefs. The problem does not arise with extraction of *what* (or *who*) because one can presuppose that Mary believes of every individual *x* in the given domain that John fixed *x*.

³¹ Incidentally, a similar criticism also applies to syntactic approaches, as noted by the reviewer.

[Liu et al. 2022] approaches to factive islands that set themselves in opposition to syntactic approaches. They are especially relevant in the present context as they use experimental evidence to support their claims. Discourse-based approaches explain the degradation of extraction from factive clauses by a special discourse function of factive verbs (i.e., backgrounding), which clashes with the discourse function of the *wh*-construction as a whole. Usage- or frequency-based approaches explain factive islands by the additive effect of (i) the tendency of factive predicates and their associated clauses to have lower (baseline) frequency and hence naturalness (in comparison to nonfactive clauses) and (ii) the lower frequency of the *wh*-construction. An important feature of both types of approaches is that they take lexical variation among predicates seriously, trying to predict the degree of acceptability of extraction with each individual predicate based on its degree of backgrounding or frequency.

While this is not a place to discuss these approaches, the fact that the experimental results showed a rather consistent effect of factivity seems to fit better with discourse-based approaches because they stress the inherent connection between factivity and backgrounding, as opposed to a mere accidental correlation between factivity and lower frequency, as in frequency-based approaches; see also [Richter, Chaves 2020] for a criticism of frequency-based approaches). At the same time, a potential problem with approaches such as [Goldberg 2013] is that they are built around the idea that backgroundedness clashes with the focus function of the “extracted” *wh*-word in questions. However, it is not clear whether the “extracted” relative pronoun in relative clauses has the same function. In fact, some discourse-based approaches [Abeillé et al. 2020] have proposed that relative pronouns have a **different** function, thus predicting no degradation for relative extraction, at least for the subject island. Note also that the above approaches mainly discuss argument extraction, so it is not clear what their predictions would be for adjunct extraction.

To conclude the paper, I have presented experimental evidence that factivity plays a role in extraction from complement clauses in Russian. Contra established views, I have shown that this effect is not limited to adjunct extraction and is just as reliable, if not more so, with argument extraction, at least for relative clause dependencies. The study

also confirmed the island status of nominalized clauses. However, unlike in other approaches, it was shown that nominalization is not an absolute barrier for extraction but instead should be viewed as a gradient constraint which may additively combine with factivity, thus supporting a theory of grammar with gradient grammaticality and cumulative constraint violation [Keller, Sorace 2005; Haegeman et al. 2014; Villata et al. 2016]³².

The main limitation of the present study is arguably that it looked at relative (as opposed to *wh*-interrogative) extractions, which are known to be less sensitive to weak/selective islands (see, e.g., [Abels 2012]), although testing the selectivity of extraction, i.e., argument/adjunct asymmetry, was not the only or primary aim of this study, which had an emphasis on nonfactive/factive asymmetry (see *Section 1.3*). Thus, the logical next step would be to compare extraction from factive and nonfactive clauses in questions but also other *wh*-constructions, e.g., scrambling, topicalization, etc. The other important limitation is that argument and adjunct extractions were compared **across** experiments. As suggested by the reviewer, it would be desirable to compare them **within** the same experiment, and further, by comparing not only DP arguments but also PP arguments with PP adjuncts. In future work, a wider range of predicates should also be tested with more attention to lexical variation. Finally, the adjunct advantage effect proposed to explain the results of Experiment 2 should be further investigated.

Appendix

Here is a link to the folder with the experimental materials: <https://osf.io/nxjdu/>.

³² The reviewer suggests that the graded islandhood of nominalized clauses may have to do with the emergence of the “new complementizer” *to čto* in colloquial varieties of Russian [Korotaev 2016], which is accompanied by the reanalysis of *to* as part of the C-layer, the assumption supported by the possible “doubling” of *to*.

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