

Wide scope indefinites in Russian

Luisa Martí and Tania Ionin

Queen Mary, University of London and
University of Illinois at Urbana-Champaign

luisa.marti@qmul.ac.uk
tionin@illinois.edu

Abstract This paper contributes to the cross-linguistic study of indefinites by reporting on two experimental studies on the scopal and functional properties of the two Russian indefinites *koe-wh* and *wh-to*. We show that *koe-wh* allows not only wide scope readings out of syntactic islands, but also functional readings, much like English *a certain*. *Wh-to*, on the other hand, allows all possible scopal readings and both functional and non-functional readings. We then discuss this state of affairs from the perspective of a number of prominent theories of indefinite scope.

Keywords: indefinites, scope, Russian

1 Introduction

There is a long, well-known tradition in the formal semantics literature focused on indefinite scope (see, among others, Abusch 1994, Brasoveanu and Farkas 2011, Breheny 2003, Charlow 2014, Endriss 2009, Farkas 2002, Fodor and Sag 1982, Kratzer 1998, Martí 2007, Matthewson 1999, Onea 2015, 2016, Portner 2002, Portner and Yabushita 1998, 2001, Reinhart 1997, Schwarz 2001, 2011, Schwarzschild 2002, Winter 1997. See Brasoveanu and Farkas 2016 for a recent overview). Particular attention has been devoted to exceptional wide scope indefinites, that is, to indefinites whose scope is (or, according to some, seems to be) outside of syntactic islands, which are known to constrain the scope of other quantifiers. (1) illustrates, for English, that indefinites may scope outside of relative clauses and give rise to both widest scope readings (WSRs from now on), as in (1)a, and intermediate scope readings (ISRs), as in (1)b (where the indefinite escapes an island but takes scope underneath a higher quantifier, *every* in this case). The scope of the indefinite in (1)c is narrowest (NSR):

- (1) Every student read every article that *a (certain)* professor recommended.
- a. There is a specific professor *x*, such that for every student *y*, *y* read every article that *x* recommended. [WSR]
 - b. For every student *y*, there is a (potentially different) professor *x*, such that *y* read every article that *x* recommended. [ISR]
 - c. For every student *y*, *y* read every article that was recommended by some professor or other. [NSR]

There is agreement in the literature that English *a certain* can give rise to WSRs and ISRs in environments such as (1), whereas English *a* can give rise to NSRs as well (Farkas 2002, Fodor and Sag 1982, Hintikka 1986, Ionin 2010, Kratzer 1998, Schwarz 2001, 2011,

among others).¹ In addition to exploring analytical possibilities and theoretical options, important work in this area has aimed at establishing a cross-linguistically valid typology of indefinite scope. Much work on bare plurals, starting with Carlson (1977), has shown that one natural class of indefinites is constituted by narrow scope indefinites. There are also at least three other cross-linguistically attested classes: dependent indefinites (of the type found in Hungarian or Romanian, as in Farkas 1997, 2002, 2007, Russian *wh-nibud'*, as in Geist 2008, Pereltsvaig 2008, Onea 2016, Onea and Geist 2011, and Yanovich 2005; see Brasoveanu and Farkas 2011 and Henderson 2014 for general remarks on this type), wide scope, functional indefinites (such as English *a certain*, as above, and German *gewiss*, as in Ebert, Ebert and Hinterwimmer 2013) and unmarked indefinites, which allow all possible readings (cf. English *a*, as above, though Schwarz 2001, 2011 shows that *a* does not allow functional readings, more on which below). This paper contributes to this typology by examining the Russian *koe-wh* and *wh-to* indefinites, and showing that, in terms of scope and functional readings, Russian *koe-wh* is in the same class as English *a certain*. In addition, we show that *wh-to* is a truly unmarked indefinite which allows all possible scopal readings and both functional and non-functional readings.

The two empirical studies we present here are, to our knowledge, the first experimental studies ever done on the scope of Russian indefinites, though indefinites in this language have indeed received attention in the theoretical literature (Eremina 2012, Dahl 1970, Geist 2008, Haspelmath 1997, Kagan 2011, Paducheva 1985, Onea 2016, Onea and Geist 2011, Pereltsvaig 2000, 2008, Yanovich 2005). Our experimental results complete and modify the received empirical picture in several ways. First, they confirm that both *koe-wh* and *to-wh* indefinites can take exceptional wide scope. Second, our findings establish the functional nature of *koe-wh*—interestingly, as long as they are functional, we found that even NSRs are possible for *koe-wh*. Third, we establish that *wh-to* indefinites give rise to a wider range of readings than *koe-wh* and than previously thought. Finally, we establish that ISRs are indeed possible for both indefinites, something which is also not clear in the existing literature. Our two studies include, in addition, a third Russian indefinite, the dependent indefinite *wh-nibud'*, which serves as a control for *koe-wh* and *wh-to*.

Once the scopal properties of *koe-wh* and *wh-to* are established, the question arises as to how to account for their behavior. We will not defend a particular analysis in this paper, but will offer brief comments on some prominent theories of indefinite scope, including Brasoveanu and Farkas (2011, 2016), Kratzer (1998, 2003), Onea (2015, 2016) and Schwarzchild (2002).

The organization of the paper is as follows. In section 2, we review what we know so far about the scopal and other properties of these two Russian indefinites. In section 3 we present our experiments and their results. Section 4 briefly discusses possible accounts of the data. Section 5 is the conclusion.

2 Previous literature on Russian indefinites

Most of what we know about the properties of Russian indefinites originates in the seminal work of Paducheva (1985), with additional developments and insights in

¹ We will speak of island contexts such as that in (1) as *long distance contexts* (as opposed to *local contexts*, where no island intervenes between the surface position of the indefinite and the position at which it seems to take scope). All the ISRs we consider are *long distance readings*. WSRs may be long distance readings or *local readings* (depending on whether an island intervenes or not). Indefinites which can take scope outside of syntactic islands are *long distance indefinites* or *exceptional wide scope indefinites*

Eremina (2012), Dahl (1970), Geist (2008), Haspelmath (1997), Kagan (2011), Onea (2016), Onea and Geist (2011), Pereltsvaig (2000, 2008) and Yanovich (2005). Russian has a number of indefinite series based on *wh*-words (see Haspelmath 1997: 273). Our focus here is on a subset of these, *wh-to* indefinites and *koe-wh* indefinites. A third type, *wh-nibud'* indefinites, is set apart from *koe-wh* and *wh-to* indefinites in that they must be licensed by an appropriate quantificational expression and are thus what is known as dependent indefinites in the literature, a type of indefinites attested in several languages (Farkas 1997, 2002, Henderson 2014, among others). Thus, where example (2) is grammatical with *koe-wh* or with *wh-to*, it is ungrammatical with *wh-nibud'* (Eremina 2012, Geist 2008, Pereltsvaig 2008, Yanovich 2005):²

- (2) Maša pročitala **koe-kakuju/kakuju-to/*kakuju-nibud' knigu.**
 Mary read koe-wh/wh-to/wh-nibud' book
 'Mary read a/some book.'

In intensional environments, *koe-wh* and *wh-to* indefinites give rise to *de re* readings, whereas *wh-nibud'* indefinites give rise only to *de dicto* readings. For example, in (3), *koe-wh* and *wh-to* give rise to a reading in which there is a specific book that Masha wants to read, whereas, in the case of *wh-nibud'*, which is licensed in this environment, Masha wants to read any book (Geist 2008, Pereltsvaig 2008):

- (3) Masha xochet pročitat' **koe-kakuju/kakuju-to/kakuju-nibud' knigu.**
 Mary wants read-Inf koe-wh/wh-to/wh-nibud' book
 'Mary wants to read some book'

Regarding their scope properties, the received view from the literature is that *koe-wh* and *wh-to* clearly allow WSRs and that NSRs are either unavailable or dispreferred for them (see Eremina 2012, Geist 2008, Onea 2016 and Onea and Geist 2011 for *koe-wh*, and Eremina 2012, Geist 2008, Onea and Geist 2011, Kagan 2007 and Yanovich 2005 for *wh-to*). *Wh-nibud'* indefinites clearly give rise to NSRs only (Geist 2008, Pereltsvaig 2008, Onea 2016, Onea and Geist 2011, Yanovich 2005). Consider first a local context, in (4):

- (4) Kazhdyj student pročital **koe-kakuju/kakuju-to/kakuju-nibud' knigu.**
 every student read-past koe-wh/wh-to/wh-nibud' book
 'Every student read some book.'

Koe-wh and *wh-to* only give rise to the WSR here ("there is a book such that every student read it"), while *wh-nibud'* gives rise only to a NSR ("every student read a (potentially different) book"). In long distance contexts, *koe-wh* (Eremina 2012, Onea 2016, Onea and Geist 2011) and *wh-to* (Onea and Geist 2011, Yanovich 2005) clearly give rise to WSRs, whereas *wh-nibud'* clearly does not (Eremina 2012, Onea 2016, Onea and Geist 2011, Yanovich 2005). (5) (cf. (1)) exemplifies with a relative clause island (indicated by brackets): according to the literature, (5) with *koe-wh* or *wh-to* should allow the WSR ((1)a), but only the NSR ((1)c) with *wh-nibud'*.

² All translations into English are approximate.

- (5) Kazhdyj student prochital kazhduju knigu, [kotoruju
 every student read every book which
 porekomendoval **koe-kakoj/kakoj-to/kakoj-nibud'** professor]
 recommended koe-wh/wh-to/wh-nibud' professor
 'Every student read every book that some professor recommended.'

In the literature, ISRs are available for *wh-to* and *wh-nibud* only, if available at all (Eremina 2012, Yanovich 2005). NSRs are only clearly available for *wh-nibud'*, but the situation for *wh-to* is unclear (cf. Yanovich 2005). NSRs are not available at all for *koe-wh* (Eremina 2012, Onea 2016, Onea and Geist 2011). Yanovich (2005) focuses on *if*-clause islands, whereas Eremina (2012) focuses on relative clauses. Overall, it is particularly unclear what the availability of ISRs is.

Finally, a feature of these indefinites that figures prominently in the literature is what is known as identifiability: whereas *koe-wh* indefinites require the speaker of a sentence like (6) to be able to identify the student that Masha talked with (as evidenced by the fact that the continuation that explicitly denies this knowledge is infelicitous, (6)a), *wh-to* indefinites require a certain degree of non-identifiability on the part of the speaker (as evidenced by the pattern of felicity in the continuations illustrated in (6)b). *Wh-nibud'* indefinites are not sensitive to this distinction (Geist 2008, Haspelmath 1997, Kagan 2011, Onea 2016, Onea and Geist 2011):

- (6) a. Masha pogovorila s **koe-kakim studentom**, i ja znaju, kto èto/
 Mary talked with koe-wh student and I know who this
 #ja ne znaju, kto èto.
 I not know who this
 'Mary talked with some student, and I know/don't know who it is.'
- b. Masha pogovorila s **kakim-to studentom**, #i ja znaju, kto èto/ja ne znaju, kto èto.
 'Mary talked with some student, and I know/don't know who it is.'

In other words, *koe-wh* indefinites are what is otherwise known as epistemically specific indefinites. *Wh-to* indefinites are ignorance, or epistemically non-specific, indefinites (Aloni and Port 2015, Alonso-Ovalle and Menéndez-Benito 2015 and references cited there, Jayez and Tovená 2006, Kratzer and Shimoyama 2002, among others). Additionally, as discussed in Kagan (2011), Onea (2016), and Onea and Geist (2011), *koe-wh* indefinites add a "secretive" component, such that the speaker of (6)a conveys not only that s/he knows who the student is, but also that s/he is not willing to reveal this knowledge.

In summary, *koe-wh* is considered to be an exceptional wide scope indefinite which disallows NSRs altogether. *Wh-to* is taken to allow both exceptional WSRs and NSRs, but to prefer WSRs. *Wh-nibud'* is a dependent indefinite. The availability of exceptional ISRs for any of them is unclear.

3 Russian wide scope indefinites: experimental studies

Our experimental studies were carried out in order to clarify the scopal properties of *koe-wh* and *wh-to* indefinites. We included *wh-nibud'* indefinites for comparison only: since these indefinites are well-known to allow NSRs and to disallow WSRs, they provide a baseline and help us ensure that our experimental studies worked as planned. For example, if *koe-wh* and *wh-to* indefinites were found to lack NSRs, we would not know

whether this is because they are derived by a mechanism that disallows NSRs, or because the contexts testing NSRs were poorly designed. But, if *wh-nibud'* is accepted with NSRs, and the other two indefinite types are not, then we know the issue is with the indefinite type, not with the design.

We conducted two separate studies on the properties of *koe-wh*, *wh-to*, and *wh-nibud'* indefinites. The two studies used somewhat different methodology, and tested a different (though overlapping) range of contexts. Convergent results from the two studies would thus provide the most convincing evidence for the (non-)existence of particular readings.

3.1. Experimental study 1

The first study is our first attempt at testing experimentally the range of possible scope readings available to *koe-wh*, *wh-to*, and *wh-nibud'* indefinites. The long distance scope configuration that we tested in this study was relative clauses headed by a universal quantificational expression, as in example (1).

3.1.1. Procedure and participants

We used a Sentence-pair Acceptability Judgment Task (AJT) in which participants rated the acceptability of the second sentence in each pair as a continuation to the first sentence, on a scale from 1 (unacceptable) to 4 (acceptable). The test contained 36 target items and 68 fillers. For all the target items, the first sentence contained an indefinite, and the second sentence established the target scope reading.³ The fillers tested a variety of other linguistic phenomena, including the scope of universal quantifiers relative to negation, cardinal vs. proportional readings of *many* quantifiers, and different readings of comparative expressions.

A between-subjects design was used to prevent participants from explicitly comparing the three types of Russian *wh* indefinites to one another. Thus, separate test versions were constructed for *koe-wh*, *wh-to*, and *wh-nibud'* indefinites: each participant saw only one test version, with only one indefinite type. Except for the type of indefinite tested, the three test versions were identical in terms of the content and ordering of test items; the fillers were the same in all three versions.

The participants were 83 adult native Russian speakers (26 native Russian speakers were tested on *koe-wh*, 28 on *wh-to*, and 29 on *wh-nibud'*)⁴. 52 of the participants took the test online (using a Google Docs link) whereas the remaining 29 took it on paper (in a linguistics class in St. Petersburg). To ensure that the testing context was not confounded with the test version, both internet-based and paper-based test participants were distributed evenly across the three test versions.

There were nine categories of target items (four tokens per category), corresponding to four separate experiments. We report on three of those experiments

³ As discussed in more detail below, in some cases the continuations were in principle compatible with more than one scope reading, due to entailment relations; the goal of the continuation was to make one of the readings more salient. Ultimately, our conclusions are based on comparisons among different conditions, rather than on performance within a single condition.

⁴ Three additional participants, all from the online version of the test, were excluded from analysis due to being 59 years of age or older, where all the other participants were below 50, and most were in their 20's and 30's. This was motivated by a concern regarding possible language change across generations, as well as the possibility that older adults had less familiarity with online test-taking.

here. The fourth experiment, not reported here, addressed availability of *de re* vs. *de dicto* readings, a topic not explored in the present paper.⁵

3.1.2. Data analysis

The rating data from each experiment were analyzed using a mixed effects model with fixed and random variables. The model was fit in the R software package (R Development Core Team 2014). The *lmer()* function of the *lme4* package (Bates, Maechler, Bolker and Walker 2015) was used; p-values were generated by means of the *afex* package (Singmann, Bolker, Westfall and Aust 2016). We introduced the following fixed effects: *indefinite* (*koe-* vs. *-to* vs. *-nibud'*) and scope (*WSR* vs. *NSR* for Experiments 1.1 and 1.2; *WSR* vs. *ISR* for Experiment 1.3). The fixed effect *indefinite * scope* was introduced as the interaction term. Participants (N=83) and items (N=4) were introduced as random effects in each experiment. Below, we report the *afex* output for each experiment.⁶ Significant interactions (below the alpha level of .05) were followed up by pairwise comparisons, implemented via the *lsmeans* function in R (Lenth 2016). The Tukey method of adjustment for multiple comparisons was automatically implemented in R.

3.1.3. Experiments and predictions

Experiment 1.1 tested scope readings in a local environment, while experiments 1.2 and 1.3 tested availability of long-distance readings out of relative clause islands. Below, we describe each of the three experiments in turn, presenting sample test items for each category as well as the results.

3.1.4. Experiment 1.1: local WSRs and NSRs

In experiment 1.1, we tested WSRs vs. NSRs in a local configuration. (7) is a sample experimental item (indefinite phrases are in bold, other quantifiers are underlined):

⁵ In that fourth experiment, we found that *wh-nibud'* allows only *de dicto* readings. As for *koe-wh* and *wh-to*, both *de re* and *de dicto* readings were allowed, with a preference for *de re* readings. While there are interesting interactions between theories of *de re/de dicto* readings and theories of exceptional indefinite wide scope, space constraints force us to leave the matter for future study.

⁶ The output of the linear mixed effects model is not provided for reasons of space, but is available upon request. The rcode used for the *lmer* function is given in (i), and the rcode for the *mixed* function from the *afex* package, used to generate p-values, is given in (ii). The *scale* function was used to correct for the potential bias of the Likert scale. The same code was used for each experiment reported below.

(i) `lmerInd=lmer(scale(rating) ~ indefinite * scope + (1|ID) + (1|item), data=indefinites)`
(ii) `mixed(lmerIND, indefinites)`

Finally, we note that in the paper-and-pencil version of the test, it was possible for participants to skip some test items. However, for the target items reported here, this was attested for only one participant, who skipped a single item in Experiment 1.1 and a single item in Experiment 1.2. The mixed models analysis, by considering performance on individual items rather than means, takes missing items into account.

- (7) Každyj sportsmen pogovoril s **koe-kakim/kakim-to/kakim-nibud'**
 every athlete talked with koe-wh/wh-to/wh-nibud'
psixologom.
 psychologist
- a. WSR/NSR
 Ètot psixolog ostalsja dovol'nym provedennymi besedami.
 this psychologist remained satisfied taken.place conversations
 'Every athlete talked with some psychologist. This psychologist was satisfied with the conversations.'
- b. NSR
 Èti psixologi ostalis' dovol'nymi provedennymi besedami.
 these psychologists remained satisfied taken.place conversations
 'Every athlete talked with some psychologist. These psychologists were satisfied with the conversations.'

In (7)a, the second sentence sets up a singleton continuation in which a single psychologist is imposed as the referent of the indefinite in the previous sentence. This continuation is logically compatible with both the WSR and the NSR of the indefinite, since in this syntactic configuration, the WSR entails the NSR (if there is one specific psychologist that every athlete talked to, then every athlete talked to at least one psychologist). The non-singleton continuation in (7)b is compatible only with the NSR, as only this reading allows for a plurality of psychologists to have been talked to by athletes⁷. A wide scope indefinite should be felicitous only in (7)a, whereas a narrow scope indefinite should be felicitous in (7)b and possibly also in (7)a (unless it has a non-singleton requirement). Note that no functional relationship is established between the athletes and the psychologists in the NSR in (7)b, which may make a potential functional indefinite less felicitous (if the indefinite requires the function to be explicit in some way, but also simply if speakers in our experiment fail to supply the function themselves).

The results for the first experiment are presented in Figure 11. There was a significant effect of indefinite ($F(2, 145.6) = 21.91, p < .0001$), a significant effect of scope ($F(1, 574) = 52.99, p < .0001$), and a significant interaction between the two ($F(2, 574.1) = 78.76, p < .0001$).

⁷ The possibility arises that the plural continuation is judged unacceptable simply because it is strange to use the plural after a singular indefinite. Our results show that this was not the case.

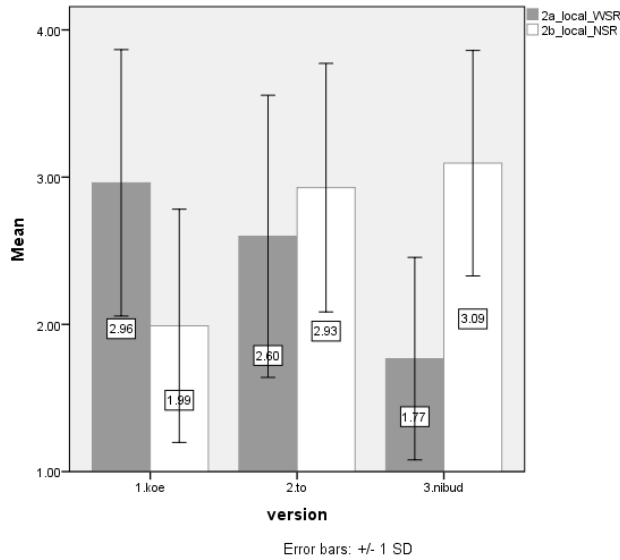


Figure 1. Results for experiment 1.1.

Follow-up comparisons via *lsmeans* revealed the following. First, the three indefinites showed three distinct patterns: *koe-wh* indefinites were rated significantly higher with the WSR/singleton continuation than with the NSR/non-singleton continuation, whereas the opposite was the case for *wh-nibud'* indefinites; for *wh-to* indefinites, the two categories did not significantly differ. Second, in the WSR category, *koe-wh* and *wh-to* indefinites were both rated significantly above *nibud'* indefinites, and no differently from one another, whereas in the NSR category, *wh-to* and *wh-nibud'* indefinites were rated significantly above *koe-wh* indefinites, and no differently from each other.

Thus, we see that *wh-nibud'* indefinites strongly resist the singleton continuation in (7)a, even though this continuation is logically compatible with the NSR as well as the WSR. This suggests that *wh-nibud'* indefinites are anti-singleton, requiring co-variation, as discussed in the literature (Geist 2008, Pereltsvaig 2008). The high acceptability of *wh-nibud'* indefinites in the NSR context furthermore shows that this context was quite felicitous, and that the lower acceptability of the other two indefinite types in this context must be due to the properties of these indefinites, not to problems with the context.

We further see that *koe-wh* indefinites resist the NSR, requiring a WSR/singleton reading, while *wh-to* indefinites are quite compatible with both types of readings.

3.1.5. Experiment 1.2: WSRs vs. NSRs in long-distance environments

In experiment 1.2, we tested the scope of indefinites inside relative clause islands. The two possible readings considered in this experiment were the long-distance WSR, as in (8)a, and the NSR, as in (8)b. As in experiment 1.1, we used singleton vs. non-singleton continuations to set up the WSR vs. NSR. Note that in this case, the entailment relation is the opposite of that in local configurations, with the NSR entailing the WSR rather than the other way around (if Anastasia solved every problem assigned by any instructor whatsoever, it follows that there is at least one specific instructor such that Anastasia solved all of this professor's assigned problems):⁸

⁸ Experiment 1.2 did not test for ISRs. If *Anastasia* were replaced with a universal phrase such as *every student*, then the sentence would in principle be three-way ambiguous between the WSR, ISR and NSR (cf. (1)). However, the format of our continuations did not allow us to tease apart ISRs from NSRs: the plural

(8) Anastasija rešila každuju zadaču, ktoruju predložil
 Anastasia solved every problem which assigned
koe-kakoj/kakoj-to/kakoj-nibud' **universitetskij** **prepodavatel'**.
koe-wh/wh-to/wh-nibud' university instructor

a. WSR:

Ètot prepodavatel' byl ochen' strogim.
 this instructor was very strict

'Anastasia solved every problem which some university instructor assigned. This instructor was very strict.'

b. NSR/WSR:

Èti prepodavateli byli ochen' strogimi.
 these instructors were very strict

'Anastasia solved every problem which some university instructor assigned. These instructors were very strict.'

The results are given in Figure 22. There was a significant effect of indefinite ($F(2, 121.83) = 20.9, p < .0001$), a significant effect of scope ($F(1, 574) = 311.61, p < .0001$), and a significant interaction between the two ($F(2, 574.06) = 239.56, p < .0001$).

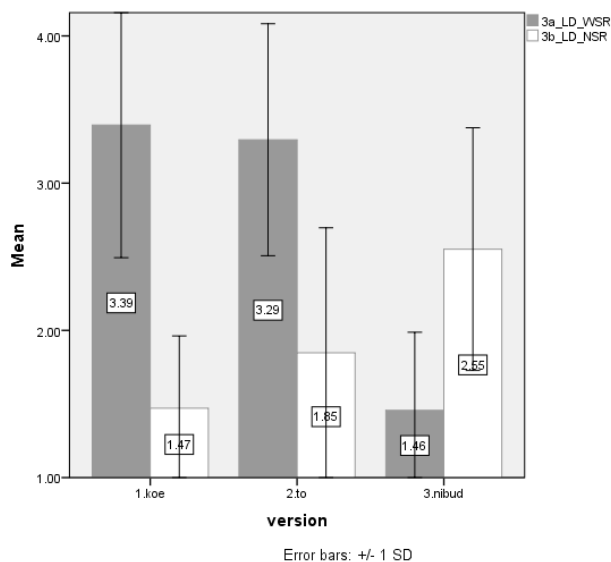


Figure 2. Results for experiment 1.2.

Follow-up pairwise comparisons revealed the following. First, both *koe-wh* and *wh-to* indefinites were rated significantly higher with the WSR than the NSR continuation, while the opposite was the case for *wh-nibud'* indefinites. Second, with the NSR continuation, *wh-nibud'* indefinites were rated significantly above the other two indefinite types, whereas the opposite was the case with the WSR continuation. The *koe-wh* and *wh-to* indefinite types did not differ from one another on either category.

Even though the NSR continuation in (8)b logically entails the WSR, both *koe-wh* and *wh-to* indefinites were rated very low in this category, indicating that they need a singleton reading. We note that the behavior of *wh-to* indefinites is quite different in

continuation with “these instructors” would be equally compatible with both. This is why tested ISRs differently, as in experiment 1.3.

experiment 1.1 (where they allow both NSRs and WSRs) than in experiment 1.2 (where they allow WSRs only).

The behavior of *wh-nibud'* indefinites is once again consistent with their requiring licensing and lacking wide-scope readings. Both *koe-wh* and *wh-to* indefinites seem to lack NSRs.

3.1.6. Experiment 1.3: long-distance WSR vs. ISR

Finally, in experiment 1.3, our goal was to test the availability of WSRs vs. ISRs in a long-distance context. In order to rule out the NSR, we set up a context where the NSR would be highly uninformative: e.g., in (9), the NSR would be paraphrased as “Every waiter served every guest whose last name began with a letter, any letter whatsoever”. However, since everyone’s last name begins with a letter, this is a pragmatically odd thing to say:

- (9) *Každyj oficiant* *obslužil* *každogo* *posetitelja,* *ch'ja* *familija*
 every waiter served every visitor whose surname
načinalas' *s* ***koe-kakoj/kakoj-to/kakoj-nibud'*** ***bukvy.***
 started with *koe-wh/wh-to/wh-nibud'* letter

a. WSR/ISR

A imenno, *s* *bukvy* *"A".*
 and namely with letter A

‘Every waiter served every guest whose last name started with some letter. Namely, the letter A.’

b. ISR/NSR

Familii ètih posetitelej *načinalis'* *s* *dvadcati raznyh* *bukv.*
 surnames these visitors started with twenty different letters

‘Every waiter served every guest whose last name started with some letter. The last names of these guests started with twenty different letters.’

The continuation in (9)a brings out the WSR, via a singleton continuation, exactly as in experiments 1.1 and 1.2. We note that logically, this continuation is also compatible with the ISR (if every waiter served every guest whose name begins with the letter ‘A’, then it follows that for every waiter, there is a letter—namely, ‘A’—such that the waiter served every guest whose name begins with that letter). In contrast, the continuation in (9)b is compatible with the ISR but not with the WSR, since the letters vary with the waiters. The continuation is also compatible with the NSR but, as noted above, the NSR is pragmatically odd. For *koe-wh* and *wh-to* indefinites, we have seen in experiment 1.2 that the WSR is fully available but the NSR is not; thus, if these two indefinites are accepted in the category in (9)b, this would indicate availability of the ISR. For *wh-nibud'* indefinites, which allow the NSR but not the WSR, acceptability of (9)b could in principle mean acceptance of the (pragmatically odd) NSR rather than acceptance of the ISR.

The results are in Figure 33. There was a significant effect of indefinite ($F(2, 134.4) = 13.89, p < .0001$), a significant effect of scope ($F(1, 575) = 43.54, p < .0001$), and a significant interaction between the two ($F(2, 575) = 69.89, p < .0001$).

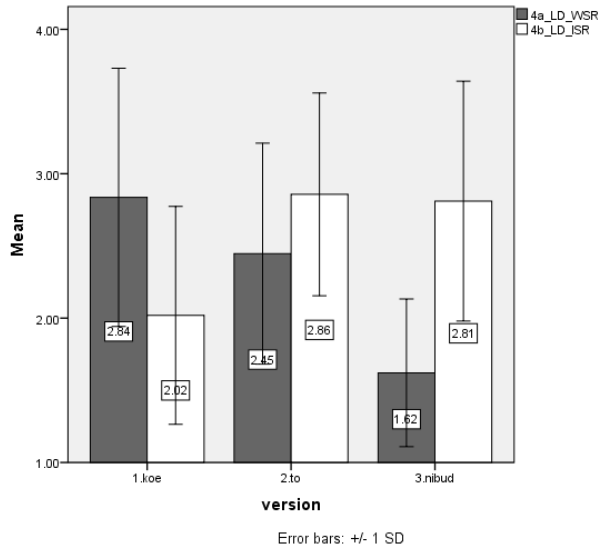


Figure 3. Results for experiment 1.3.

Results of follow-up pairwise comparisons revealed the following. First, *koe-wh* indefinites were rated significantly higher with the WSR than the ISR continuation, while the opposite was the case for both *wh-to* and *wh-nibud'* indefinites. Second, in the WSR category, *koe-wh* and *wh-to* indefinites were rated significantly above *wh-nibud'* indefinites, and no differently from each other, exactly as in experiment 1.2. In contrast, in the ISR category, *wh-to* and *wh-nibud'* indefinites were rated significantly above *koe-wh* indefinites and no differently from each other.

Thus, we see that *wh-nibud'* indefinites consistently disallow WSRs. The results of experiment 1.3 suggests that *wh-nibud'* indefinites allow ISRs; however, it could also be the case that the reading allowed for *wh-nibud'* indefinites in (9)b is actually the pragmatically odd NSR: if the 20 letters of the alphabet are the only ones under consideration (i.e., if there happened to be no clients whose names started with the remaining letters), then the NSR would be true. This means that we do not know whether it is the ISR or the NSR that is causing *wh-nibud'* indefinites to be so acceptable here.

We furthermore see that *koe-wh* indefinites have a strong preference for WSRs, not allowing ISRs (or NSRs, which is confirmed in experiment 1.2). In contrast, for *wh-to* indefinites, a comparison across experiments 1.2 and 1.3 indicates that they allow long-distance WSRs, and disallow NSRs inside an island; however, they do appear to allow ISRs, and indeed, prefer ISRs to WSRs in experiment 1.3.

3.1.7. Study 1: summary and limitations

The behavior of *koe-wh* indefinites is quite consistent across the three experiments: they allow WSRs, but not NSRs or ISRs. *Wh-to* indefinites clearly allow local NSRs (experiment 1.1) and ISRs (experiment 1.3) in the scope of a higher quantifier and appear to lack NSRs inside islands (experiment 1.2). The empirical picture that arises from study 1 is not too different from that in the existing literature, specially with respect to *koe-wh* indefinites.

One limitation of study 1 is that experiment 1.3 did not completely rule out NSRs in the ISR sentence type in (9)b, which means that we may not have succeeded at testing the availability of ISRs. Another limitation is that only one type of scope island was tested (relative clauses), and we do not know whether our findings would generalize to other types of scope islands. Finally, study 1 did not tease apart functional from non-functional readings, which may have resulted in an incomplete picture about the behavior of at least

koe-wh indefinites. These considerations led us to conduct our second experimental study.

3.2. Experimental study 2

Study 2 had three goals: (i) to address the availability of ISRs, teasing them apart from WSRs and NSRs to a greater extent than was done in study 1; (ii) to distinguish functional and non-functional readings to the extent possible; and, in addition, (iii) to test different types of scope islands, in order to determine whether the results generalize beyond one syntactic environment. Goal (i) was met by implementing a different experimental methodology, one in which each reading (WSR vs. ISR vs. NSR) was paraphrased, as will be shown below.

With regard to goal (iii), in addition to relative clause islands (which were already tested in study 1), study 2 tested *if*-clauses as well (cf. Yanovich 2005). As shown below, in Russian, just as in English, *if*-clauses are scope islands for non-indefinite (e.g., universal) quantifiers:

- (10) Dva mal'čika budut rady, esli každaja devočka pridet na večerinku.
two boys will happy if every girl comes on party
'Two boys will be happy if every girl comes to the party.'
two>every: There are two specific boys, such that these boys will be happy if all the girls come to the party.
*every>two: For every girl, if that girl comes to the party, then two (potentially different) boys will be happy.

Turning to goal (ii), we think that one reason why *koe-wh* indefinites might not have given rise to ISRs or NSRs in study 1 is that this study was not designed to tease apart functional from non-functional readings. This study did not provide support (in the form of a bound variable in the indefinite phrase, for example; cf. Kratzer 1998) for functional readings; if functional readings do in fact need this support, then it is possible that study 1 had the results it did not because ISRs or NSRs are absent for, e.g., *koe-wh* indefinites, but because functional readings were not properly supported. The question then is how to best test for functional readings.

We know at least since Kratzer (1998) that functional readings are particularly available when made explicit (e.g., by pronoun binding, or by mentioning the function in question). According to Kratzer, functional readings (more specifically, f-ISRs), are brought about (or brought about more easily) if the higher quantificational expression binds a pronoun in the indefinite, as in *Every student read every book that a professor of his recommended*. In a pilot study, we examined whether including a bound variable pronoun in the indefinite in such examples affected availability of functional readings in Russian, and found that it did not.

Another possible way to tease apart functional from non-functional readings can be found in Schwarz (2001, 2011). Schwarz shows that downward-entailing environments can help tease apart functional from non-functional readings, both NSRs and ISRs. Consider (12), which contrasts with (11):

- (11) [No boy]₁ talked with *a certain* female relative of his₁ about girls.
(12) [No boy]₁ talked with *a* female relative of his₁ about girls.

Both examples rule out narrow scope for *a female relative of his* with respect to *no boy*, given the binding relation between *his* and *no boy*. *A certain*, as in (11), only gives rise to functional readings in these contexts: the sentence is true when no boy talked with a particular kind of female relative—the one that stands in the mother-of relation with each of them, for example. The sentence in that case would be true if the boys talked with their sisters, grandmothers, etc., about girls, but no boy talked with his mother about girls. This is a functional narrow scope reading (f-NSR). (12), on the other hand, is true only when no boy talked with any female relatives of his about girls. Sentence (12) does not introduce a particular relation between boys and female relatives—it is thus a non-functional narrow scope reading (non-f-NSR). Study 2 thus included an experiment that tested for functional vs. non-functional NSRs in downward-entailing environments such as (11)/(12) (see experiment 2.2, section 3.2.5).

Schwarz shows that f-ISRs and non-f-ISRs can be teased apart in a similar way, as in (13) and (14). One complication that arises here is the complexity of the examples, which include a negative quantifier, pronoun binding, and an indefinite. This problem arises already in the case of examples such as (11)/(12) but it is more severe once ISRs come into the picture.

(13) [No boy]₁ tried every dish that *a certain* female relative of his₁ had made

(14) [No boy]₁ tried every dish that *a* female relative of his₁ had made

Example (13) allows for a f-ISR in which no boy tried every dish that, for example, his mother made—though each boy could have tried every dish that some other female relative of his made. Example (14) is false in this kind of scenario. Instead, that sentence seems to give rise to a non-f-ISR in which no boy tried every dish made by any of his female relatives. To the complications of examples such as (11)/(12), we now add embedding, an additional quantifier, and a syntactic island. Not surprisingly, the native Russian speakers we consulted for introspective judgments deemed the Russian equivalents of (13)/(14) very complex and hard to judge, and we therefore decided against including such sentence types in our experimental study.

Notice that Endriss' (2009) attempt at teasing apart these readings in the German (15)/(16) is problematic for other reasons (the example is meant to be read with stress on *ein* 'a'):

(15) Jeder deutsche Star hat schonmal der Bildzeitung
 Every German star has once the newspaper.Bild
 gedroht, sie zu verklagen, wenn EIN Photo von ihm
 threatened her to sue if some photo of him
 veröffentlicht werden sollte
 published will should
 'Every German star has threatened to sue the *Bild* newspaper if some photo of him is published.'

Endriss argues that the pair-list elaboration of (15) in (16) cannot have a function as its source, since there is no systematic relationship between the star and the photo that triggers his suing of the newspaper:

(16) For Wolfgang Petry it was a picture of him without his wristlets, for Stefanie Härtl it was a picture of her with her daughter...And I have no idea why they threatened to sue *Bild* because of these photos

The claim is that the ISR of (15) is a non-functional reading. This argument, however, is based on the assumption that a functional source for a reading can only be entertained by a speaker if she or he can name the function, if the function is ‘natural’ (in some sense of that word) or if, at the very least, the speaker knows its description—the speaker must know more about that function than the mere set of pairings (one can describe the pairings in (16) as provided by that function which has the output ‘picture of Wolfgang Petry without his wristlets’ for the input ‘Wolfgang Petry’; the output ‘picture of Stefanie Härtl with her daughter’ for the input ‘Stefanie Härtl’, etc.). The problem is that nothing rules out a functional source in a situation in which the function cannot be named, is not natural, or the speaker cannot do more than list a set of pairings.

Despite this, the following, weaker claim is likely, albeit not necessarily, true: if a function is in fact named, natural or the speaker otherwise knows more than just a mere set of pairings, then a functional reading is present. That is, nothing rules out a non-functional reading in a situation in which a function is named, natural, etc. That this would happen, however, seems very unlikely, given the general systematic use of the information made salient contextually in the interpretation of natural language sentences. Thus, in designing study 2, we assumed that supporting a function (by naming it, etc.) entails the presence of a functional reading. For the reasons discussed above, we didn’t assume that not supporting a functional reading means that the functional reading is unavailable (or that only the non-functional one is available).^{9, 10}

3.2.1. Procedure and participants

In study 2, we used an AJT in which each item consisted of a sentence followed three different paraphrases, all beginning with *Tochnee...* (‘More precisely/that is...’). The AJT consisted of 20 target items and 24 fillers. Participants rated the acceptability of each paraphrase of the original sentence, on a scale from 1 (unacceptable) to 4 (acceptable), as before. For the target items, the original sentence contained an indefinite, and the three paraphrases were intended to bring out one of the three readings: the WSR, the NSR, and a functional reading (either f-ISR or f-NSR, depending on the syntactic configuration).¹¹ We took a supported function in the paraphrase to be indicative that a functional reading is present, as explained above. The fillers tested other grammatical phenomena, as in study 1.

Also as in study 1, a between-subjects design was used, with separate test versions for *koe-wh*, *wh-to*, and *wh-nibud’*. Except for the type of indefinite tested, the three test versions were identical in terms of the content and ordering of test items; the fillers were the same in all three versions. The participants were 53 adult native Russian speakers (18 native Russian speakers were tested on *koe-wh*, 15 on *wh-to*, and 20 on *wh-nibud’*). All participants resided in the city of Oryol and completed a paper-version of the test.

⁹ Other attempts at teasing apart these readings can be found in Ebert, Endriss and Hinterwimmer (2007) and Ionin (2015), neither of which proved useful for our purposes.

¹⁰ The empirical picture that emerges regarding f-ISRs and non-f-ISRs from our consultation with speakers is that *koe-wh* indefinites allow only f-ISRs in examples such as (13) and (14), and that *wh-to* indefinites allow both f-ISRs and non-f-ISRs in such examples. These intuitions are compatible with the results for f-ISRs that we obtain in the experiments that follow.

¹¹ As in the case of Study 1, the paraphrases could not in all cases fully disambiguate the scope, since, as discussed below, some readings entail others. Therefore, our conclusions are based on comparisons among different conditions, which do allow us to determine which scope readings are (un)available.

The target items corresponded to five separate experiments (four tokens per experiment). Each experiment tested scope interpretation in a different syntactic configuration. We report on four of the five experiments here.¹²

3.2.2. *Data analysis*

As in Study 1, the rating data from each experiment were analyzed using a mixed effects model with fixed and random variables. The model was fit in the R software package, by means of the *lmer()* function of the *lme4* package, and with the *afex* package used to generate p-values. We introduced the following fixed effects: *indefinite* (*koe-* vs. *-to* vs. *-nibud'*) and scope (WSR vs. ISR (or another functional reading) vs. NSR). The fixed effect *indefinite * scope* was introduced as the interaction term. Participants (N=53) and items (N=4) were introduced as random effects in each experiment. Below, we report the *afex* output for each experiment.¹³ Significant interactions were followed up by pairwise comparisons, implemented via the *lsmeans* function in R, as in Study 1.

3.2.3. *Experiments and predictions*

In experiment 2.1, we tested a basic local scope configuration, with a universal quantifier in subject position. As discussed below, in this configuration, the functional NSR entails the non-functional NSR, which is why non-functional indefinites are predicted to allow the functional NSR. In contrast, experiment 2.2 tested a local scope configuration in the context of downward entailment (with a negative quantifier in subject position), which means that the functional NSR will be available only to truly functional indefinites. Finally, experiments 2.3 and 2.4 tested two types of scope islands, in which the ISR is set up as a functional reading, and the NSR as a non-functional one. In the island configuration, the WSR entails the ISR (functional or not), which is why the ISR is expected to be available to all types of indefinites which allow long-distance scope.

3.2.4. *Experiment 2.1: Local scope configuration*

In experiment 2.1, we tested the indefinites in a local scope configuration with a universal quantifier in subject position, as in experiment 1.1. There were three possible continuations. The first one was compatible with a WSR (and, by entailment, with a NSR, either functional or not), exemplified in (17)a. The second one explicitly supported a f-NSR (though it did not rule out a non-f-NSR) and is incompatible with a WSR, (17)b. The third one is in principle compatible with either a functional or a non-functional NSR, but did not explicitly support a functional interpretation, (17)c. Notice that this design, while

¹² The fifth experiment tested the scope of indefinites inside *because*-clauses. The results were largely similar to those of the other two experiments (2.3 and 2.4) which tested indefinites inside islands. We do not report on the *because*-clause experiment here, due to a reviewer's concern that the NSRs and ISRs are particularly difficult to tease apart in this configuration.

¹³ As in study 1, the output of the linear mixed effects model is not provided for reasons of space, but is available upon request. The rcode was the same as in study 1, see footnote 6. As in the case of study 1, we note that the paper-and-pencil format made it possible for participants to skip some test items. Four participants who consistently skipped items across whole pages of the test were excluded from analysis (these participants are not included in the counts reported in section 3.2.1). Of the participants retained for analysis, one participant failed to respond to a single item in Experiment 2.1, otherwise all responses to target items were complete.

not fully teasing apart functional from non-functional readings, has the potential to detect the importance of functional support for functional readings:

(17) *Každyj doktor osmotrel koe-kakogo/kakogo-to/kakogo-nibud' pacienta.*
 every doctor examined *koe-wh/wh-to/wh-nibud'* patient
 'Every doctor examined some patient'

a. WSR/NSR (no function supported):

Točnee, vse doktora osmotreli odnogo i togo že pacienta.
 more.precisely all doctors examined one and same PART patient
 'That is, all the doctors examined the same patient.'

b. f-NSR (function supported):

Točnee, každyj doktor osmotrel samogo bol'nogo pacienta v ego
 more.precisely every doctor examined most sick patient in his
 otdelenii.
 unit

'That is, every doctor examined the sickest patient in his unit.'

c. NSR (no function supported):

Točnee, vse doktora osmotreli raznyh pacientov.
 more.precisely all doctors examined different patients
 'That is, all the doctors examined different patients.'

The results of experiment 2.1 are given in Figure 44. There was no significant effect of indefinite ($F(2, 102.98) = 1.96, p=.15$), but there was a significant effect of scope ($F(2, 573) = 23.24, p<.0001$), as well as a significant interaction between the two variables ($F(4, 573.06) = 19.26, p<.0001$).

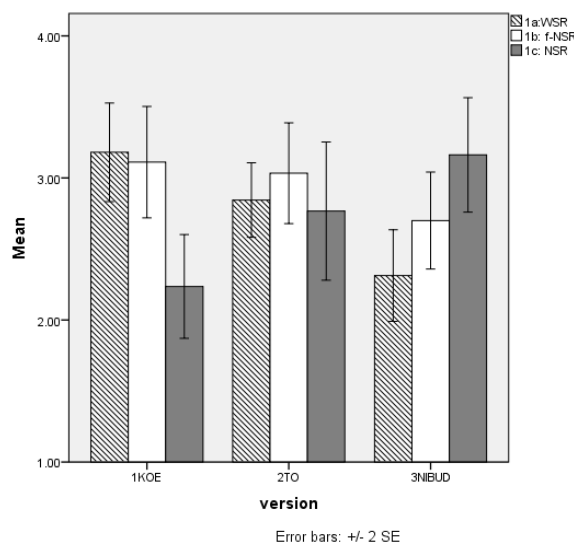


Figure 4. Results for experiment 2.1.

Follow-up comparisons via *lsmeans* revealed that for *koe-wh*, both the WSR and the f-NSR (with function support) were rated significantly above the NSR without function support, while for *wh-nibud'*, the opposite was the case: the non-functional NSR was rated significantly above both the WSR and the f-NSR. For *wh-to*, there were no differences in the ratings of the three interpretations. For both the WSR and the NSR without function

support, ratings for *koe-wh* and for *wh-nibud'* differed significantly (in the opposite direction), while there were no differences for the functionally-supported NSR.

The behavior of *koe-wh* indefinites suggests that *koe-wh* indefinites do give rise to f-NSRs when the function in question is explicitly supported. Their f-NSR is infelicitous when no such function is supported, and they do not give rise to non-f-NSRs. *Wh-to* indefinites allow NSRs in both circumstances, as well as WSRs. And finally, *wh-nibud'* indefinites appear to have a preference for non-functional NSRs (though note that their f-NSRs were rated about the same as the f-NSRs of the other indefinites).

3.2.5. Experiment 2.2: Local downward-entailing scope configuration

In experiment 2.2, the f-NSR is truth-conditionally distinct from both the WSR and the non-f-NSR. Only the WSR is true in (18)a, only the f-NSR is true in (18)b, and both the non-f-NSR and, by entailment, the WSR, are true in (18)c. Notice that the f-NSR of (18)b is properly supported by the explicit mention of a function. This experiment is crucial in that it allows us to tease apart functional from non-functional readings, as discussed above. One possible confound here is that it is very difficult to obtain a non-f-NSR for the sentence in (18)c, with any Russian *wh*-indefinite, because Russian is a negative concord language, and the NSR is best expressed by a negative indefinite, e.g., *ni odnogo prestupnika*, 'not a single criminal'. We did indeed find that (18)c was quite unacceptable for many speakers.

(18) *Ni odin policejskij ne arestoval koe-kakogo/kakog-to/kakogo-nibud'*

NEG one policeman NEG arrested *koe-wh/wh-to/wh-nibud'*

prestupnika.

criminal

'No policeman arrested some criminal.'

a. WSR:

Točnee, policejskie ne arestovali izvestnogo mafiozi, kotoryj podkupil
more.precisely policemen NEG arrested famous mafiosi which bribed
vsju policiju.

all police

'That is, the policemen did not arrest a famous mafiosi who had bribed the entire police department.'

b. f-NSR (function supported):

Točnee, ni odin policejskij ne arestoval togo prestupnika,
more.precisely NEG one policeman NEG arrested that criminal
kotoryj dal emu vzjatku.

which gave him bribe

'That is, no policeman arrested the criminal who gave him a bribe.'

c. non-f-NSR/WSR:

Točnee, policejskie voobščee ne arestovali nikakih prestupnikov.
more.precisely policemen at.all NEG arrested no.wh criminals

'That is, the policeman did not arrest any criminals at all.'

The results of experiment 2.2 are given in Figure 55. There was a significant effect of indefinite ($F(2, 126.49) = 5.24, p=.007$), a significant effect of scope ($F(2, 574) = 34.96, p<.0001$), and a significant interaction between the two ($F(4, 574) = 16.25, p<.0001$).

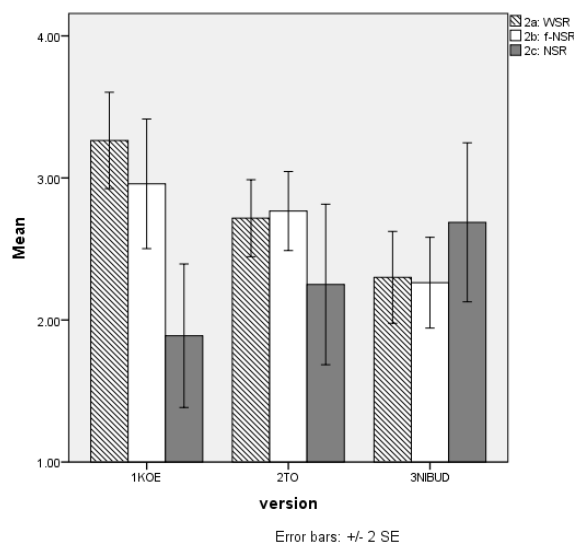


Figure 5. Results for experiment 2.2.

Follow-up comparisons found that for *koe-wh*, the non-f-NSR was rated significantly below the other two readings, which did not differ from each other. The three readings were not rated significantly differently for the other two indefinite types. Furthermore, *koe-wh* was rated significantly above *wh-nibud'* for the WSR, marginally above it for the f-NSR, and significantly below it for the NSR. There were no other significant differences.

Thus, for *koe-wh*, we see that both the WSR and the f-NSR are available, as in experiment 2.1. A similar pattern is exhibited by *wh-to*, but the difference with regular, non-f-NSR does not reach significance. For *wh-nibud'*, the regular NSR is numerically the most preferred reading, but again, this difference does not reach significance. The relative infelicity of the regular NSR expressed without negative concord is most likely lowering the ratings for the non-functional NSR even for indefinites (*wh-to* and *wh-nibud'*) for which it would otherwise be available (but note that the non-f-NSR did receive significantly higher ratings for *wh-nibud'* than for *koe-wh*). The fact that no reading is very acceptable for *wh-nibud'* can be explained if this indefinite only allows non-f-NSR, which in this context is pragmatically odd.

Comparing these results with those of experiment 2.1, the behavior of *koe-wh* indefinites in experiments 2.1 and 2.2 suggests that they do indeed give rise to f-NSRs, but also that such readings need proper function support in order to surface. The analysis of *wh-to* is not very clear, but the fairly high ratings of the f-NSR suggest that *wh-to* does give rise to functional readings.

3.2.6. Experiment 2.3: long-distance scope configuration, if-clause

In experiments 2.3 and 2.5, we tested the scope of the relevant indefinite in different long-distance scope configurations. Experiment 2.3 tests the configuration in which the indefinite is embedded in the antecedent of a conditional. We tested for function-supported ISRs in this category. Notice that (19)a is true on the WSR and, by entailment, on the ISR, and that (19)c is true on the NSR and, by entailment, on the WSR and the ISR. (19)b is true only on the ISR; given the function support provided in the paraphrase, we assume that (19)b tests for f-ISRs:

(19) *Každyj vos'miklassnik budet rad, esli koe-kakaja/kakaja-to/kakaja-nibud'*
 every eighth-grader will glad if *koe-wh/wh-to/wh-nibud'*
devochka pridet na vecherinku.
 girl comes on party

'Every eighth-grade boy will be happy if some girl comes to the party.'

a. WSR/ISR (no function supported):

Točnee, vse vos'miklassniki budut rady, esli samaja populjarnaja
 more.precisely all eight-graders will glad if most popular
 devochka v klasse pridet na vecherinku.
 girl in class comes on party

'That is, all the eight-grade boys will be happy if the most popular girl in the class comes to the party.'

b. f-ISR (function supported):

Točnee, každyj vos'miklassnik budet rad, esli ta devochka,
 more.precisely every eighth-grader will glad if that girl
 kotoraja emu osobenno nraivitsja, pridet na vecherinku.
 which him especially appeals comes on party

'That is, every eighth-grade boy will be happy if the girl that he particularly likes comes to the party.'

c. NSR/WSR/ISR (function not supported):

Točnee, každyj vos'miklassnik budet rad, esli xot' odna
 more.precisely every eighth-grader will glad if at.least one
 devochka, kakaja ugodno, pridet na vecherinku.
 girl which whatsoever comes on party

'That is, every eighth-grade boy will be happy if at least one girl, any one, comes to the party.'

The results of experiment 2.3 are given in Figure 66. There was a significant effect of indefinite ($F(2, 124.77) = 4.35, p=.01$), a significant effect of scope ($F(2, 574) = 61.62, p<.0001$), and a significant interaction between the two ($F(4, 574) = 29.68, p<.0001$).

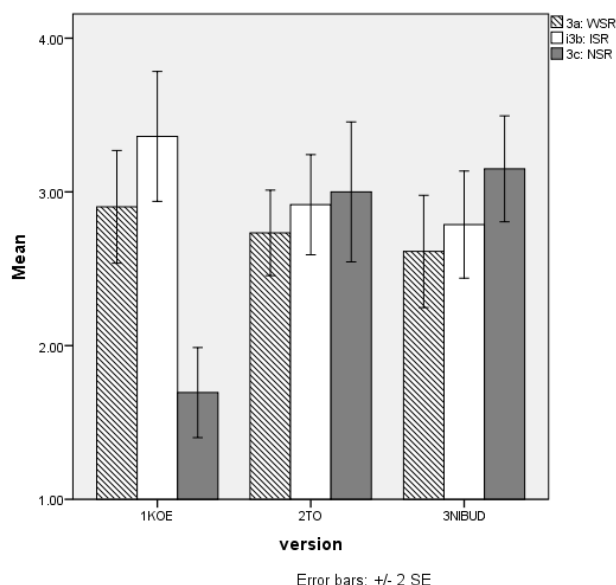


Figure 6. Results for experiment 2.3.

Follow-up comparisons found that for *koe-wh*, the functionally unsupported NSR (cf. (19)c) was rated significantly below the WSR and the f-ISR, while the WSR was rated marginally below the f-ISR. For *wh-nibud'*, the NSR was rated significantly above the WSR. For *wh-to*, there were no differences among the three readings. Finally, *koe-wh* was rated significantly below the other two indefinite types for the non-functionally supported NSR. There were no other significant differences.

Thus, we continue to see the same pattern as before for *koe-wh*, with functionally unsupported readings unavailable, but the WSR and the f-ISR available. As before, *wh-to* allows all scope readings and is not sensitive to function support. Unexpectedly, *wh-nibud'* received rather high ratings on the WSR, even though these are significantly lower than for the functionally unsupported NSR. We have seen in other experiments (1.2 and 1.3) that *wh-nibud'* indefinites disallow the WSR. Since *wh-nibud'* indefinites are not the focus of our investigation, we lay this issue aside, and focus on the other two indefinite types.

3.2.7. Experiment 2.4: long-distance scope configuration, relative clause

Finally, in experiment 2.4, we tested for the scope of an indefinite embedded in a relative clause (as we did in experiments 1.2 and 1.3). Once again, we tested WSRs, f-ISR, and functionally unsupported NSRs, as illustrated in (20):

- (20) Každyj pacient prinjal každoe lekarstvo, kotoroe propisal
 every patient took every medication which prescribed
koe-kakoj/kakoj-to/kakoj-nibud' doktor.
koe-wh/wh-to/wh-nibud' doctor
 'Every patient took every medication that some doctor prescribed.'

a. WSR/ISR (no function supported):

Točnee, vse pacienty prinjali vse lekarstva, propisannye glavnym
 more.preciselyall patients took all medications prescribed main
 kardiologom v bol'nice.
 cardiologist in hospital

'That is, all the patients took all the medications that the head cardiologist in the hospital prescribed.'

b. f-ISR (function supported):

Točnee, každýj pacient prinjal vse lekarstva, propisannye ego lečaščim
 more.preciselyevery patient took all medication prescribed his treating
 vračom.
 doctor

'That is, every patient took all the medications that his case doctor prescribed.'

c. NSR/WSR/ISR (function not supported):

Točnee, vse pacienty prinjali vse lekarstva, propisannye
 more.preciselyall patients took all medications prescribed
 kakimi by to ni bylo doktorami.
 some whatsoever doctor

'That is, all the patients took all the medications that any doctor prescribed'.

The results of experiment 2.4 are given in Figure 77. There was no significant effect of indefinite ($F(2, 118.74) = 2.20, p = .12$), but there was a significant effect of scope ($F(2, 574) = 26.86, p < .0001$) and a significant interaction between the two variables ($F(4, 574) = 19.83, p < .0001$).

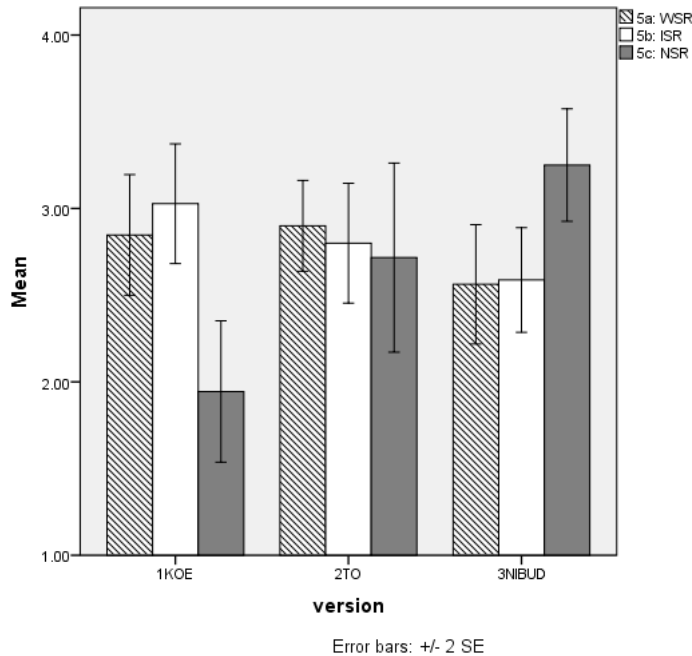


Figure 7. Results for experiment 2.4.

Follow-up comparisons found that for *koe-wh*, the functionally unsupported NSR was rated significantly below the WSR and the f-ISR; for *wh-nibud'*, both the WSR and the f-ISR were rated significantly below the NSR. For *wh-to*, there were no differences among the three readings. With the NSR, *koe-wh* was rated significantly lower than the other two indefinite types. There were no other significant differences.

Thus, we continue to see that the functionally unsupported NSR is the preferred reading for *wh-nibud'* and the unavailable reading for *koe-wh*, while all three readings are available to *wh-to*. We note that the results of exp. 2.4 for *wh-to* contradict those of exp. 1.2: even though both experiments tested the same configuration (relative clause islands), the NSR was found to be unavailable to *wh-to* in exp. 1.2, but fully available in exp. 2.4.

3.2.8. Summary of experimental results

We summarize here not only the results of study 2, in **Table 2**, but those of study 1 as well, in **Table 1**, for ease of comparison (the symbol '?' indicates marginal acceptability, approaching the midpoint of 2.5 on the 1-4 scale):

Table 1. Results for Study 1: readings found to be acceptable.

	experiment 1.1	experiment 1.2	experiment 1.3
	universal QP subject	RC island	RC island
<i>koe-wh</i>	WSR	WSR	WSR
<i>wh-to</i>	WSR, NSR	WSR	?WSR, ISR

Table 2. Results for Study 2: readings found to be acceptable.

	experiment 2.1	experiment 2.2	experiment 2.3	experiment 2.4
	universal QP subject	negative QP subject	<i>if</i> -clause island	RC island
<i>koe-wh</i>	WSR, f-NSR	WSR, f-NSR	WSR, f-ISR	WSR, f-ISR
<i>wh-to</i>	WSR, f-NSR, NSR/function unsupported reading	WSR, f-NSR, ?NSR/function unsupported reading	WSR, f-ISR, NSR/function unsupported reading	WSR, f-ISR, NSR/function unsupported reading

The behavior of *koe-wh* indefinites is quite consistent across all experiments in study 2: they consistently allow WSRs and functional readings (both f-NSRs, in experiments 2.1 and 2.2, and f-ISRs, in experiments 2.3 and 2.4), and disallow non-f-NSRs (see in particular experiment 2.2). Function-unsupported readings seem to be absent. The behavior of *wh-to* indefinites is not as straightforward. Across the four experiments in study 2, *wh-to* indefinites appear to allow all possible readings. This by itself could indicate a problem with the experimental design, where participants simply accept all continuations due to a yes-bias or fatigue with the test. However, a comparison between *wh-to* and the other two indefinite types shows that this cannot be the case: participants from the same population clearly distinguished between the different readings for *koe-wh* indefinites (lowered ratings for non-f-NSRs/function unsupported readings), as well as for *wh-nibud'* indefinites (lowered ratings for WSRs), yet allowed all the possible readings for *wh-to* indefinites. This suggests that *wh-to* indefinites do indeed have all the readings available to them.

The only reading which received quite low ratings for *wh-to* indefinites was the non-f-NSR in experiment 2.2. However, recall that this reading was somewhat infelicitous, since the non-f-NSR in the scope of a negative quantifier is best expressed by means of negative concord. Even *wh-nibud'* indefinites, which are well-established to have NSRs, received somewhat lowered ratings for the NSR in experiment 2.2 (relative to the NSRs in the other experiments). The only experiment which fully teased apart functional readings from non-functional ones was experiment 2.2; the results for the f-NSR category in this experiment indicate that the functional readings are indeed available to *wh-to*.

Taken together, the results of study 1 (where *koe-wh* indefinites were found to lack function unsupported ISRs and function unsupported NSRs, and allow only WSRs) and the results of study 2 (which showed WSRs, f-ISRs and f-NSRs to be available to this indefinite type) indicate that *koe-wh* indefinites allow not only exceptional wide scope readings, but functional readings as well.

The results indicate that *wh-to* indefinites do not need function support (experiments 1.1, 1.3, 2.1, 2.3, 2.4), which may be taken to mean that they can give rise to non-functional readings. At the same time, the results of experiments 1.2 and 2.2 indicate unavailability of function unsupported NSRs. Experiment 2.2 suggests availability of the f-NSR, experiments 2.3 and 2.4, availability of f-ISR. Experiments 1.2, 2.2, 2.3 and 2.4 suggest availability of WSRs. We do not know why *wh-to* behaves differently in some experiments than in others. However, we believe that the very existence of this variability speaks in favor of analyzing *wh-to* indefinites as indefinites which have both functional and non-functional readings available to them. Across experiments, the functional reading appears to be preferred to the non-functional: f-ISRs and f-NSRs, as well as the WSR, are always available, whereas we see variability in the availability of non-functional

readings (or readings where a function is not supported). A further question is whether *wh-to* indefinites have non-f-ISR. Our data clearly show that function unsupported NSRs are available (experiments 1.1, 2.1, 2.3, 2.4 and 2.5) (and, thus, possibly non-f-NSRs) as well as f-ISRs (experiments 2.3 and 2.4). But even though experiment 1.3 tested for ISRs, this experiment did not tease apart the ISR from the NSR; on the basis of this experiment alone, we do not have sufficient grounds to argue that *wh-to* indefinites have non-f-ISRs. Experiment 2 did not allow us to tease apart f-ISRs from non-f-ISRs, for the reasons discussed above. Given that *wh-to* indefinites do not seem to need function support, and that informal intuitions point to the availability of non-f-ISRs (see ft. 10), we think it likely that these indefinites do actually give rise to such readings, making them unmarked indefinites, that is, indefinites that allow all five possible readings.

The most important findings of our experimental studies with respect to the previous literature on Russian indefinites (see section 2) is that both ISRs and NSRs (in local or long-distance contexts) are available for *koe-wh* indefinites when they are functional readings. In addition, ISRs and NSRs readings are available for *wh-to* indefinites, and this is possibly the case for both functional and non-functional ISRs and NSRs.

4 Theories of indefinite scope

The previous literature on Russian indefinites makes use of contextually provided choice function variables in the analysis of *koe-wh* indefinites (Eremina 2012, Geist 2008, Onea and Geist 2011), much as in Kratzer's (1998, 2003) classical analysis (cf. Matthewson 1999, Schlenker 2006, Winter 1997, among others). Kratzer (1998) proposes that indefinite NPs may introduce choice function variables, of type $\langle et, e \rangle$, that stay free and receive a value according to what the speaker has in mind. Such indefinites will seem to take the widest possible scope—their contextual provision makes them effectively scopeless. This will be the case whether the indefinite is embedded in a syntactic scope island or not, and thus it will seem that they take scope outside of such islands. Kratzer choice functions may be Skolemized by adding an additional argument to them (making them of type $\langle e, \langle et, e \rangle \rangle$). With Skolemization, a higher c-commanding quantifier can bind that additional argument, and the argument can vary systematically with the values introduced by the higher quantifier—this is what we want for ISRs. Eremina and Geist do not consider the possibility of Skolemized choice function variables (that is, choice functions with added parameters) for *koe-wh*, but clearly that is needed in order to account for the f-ISRs and f-NSRs which these indefinites have been shown in this paper to give rise to. Eremina and Geist treat *wh-to* as introducing a contextually provided, possibly Skolemized choice function variable (Yanovich 2005 does not use Skolemization for *wh-to*). In addition, and in order to predict non-f-ISRs, this type of account has to be supplemented with the possibility of (suitably constrained)¹⁴ existential closure of choice function variables, as in Reinhart (1998) (something which doesn't seem desirable in principle, as suggested by Brasoveanu and Farkas 2016 and others).

The behavior of *koe-wh* indefinites is also consistent with the singleton indefinites analysis of Schwarzschild (2002), a possibility not considered in the literature on Russian indefinites with the exception of Onea and Geist (2011), discussed below. Schwarzschild

¹⁴ Suitably constrained because top-most existential closure must not be allowed, for reasons discussed Chierchia (2001) and Schwarz (2001, 2011), contra Matthewson (1999). Schwarz (2001, 2011) shows that intermediate existential closure of choice function variables, as in Reinhart (1997), gives rise to non-f-ISRs.

proposes that indefinites are always existential generalized quantifiers, even exceptional wide scope indefinites. They are not ambiguous, and they do not QR out of syntactic islands. As opposed to other generalized quantifiers like *every*, however, indefinites can have their domain reduced to a singleton set (cf. Portner 2002, Portner and Yabushita 1998, 2001). When the domain of an indefinite is a singleton set, WSRs and f-ISR arise (for f-ISRs, binding into the restriction by a c-commanding quantifier is assumed). If *koe-wh* indefinites are taken to obligatorily reduce their domain to a singleton, the constellation of readings uncovered here for these indefinites is predicted. As for *wh-to* indefinites, they are amenable to such a treatment as well, as long as the reduction of their domain to a singleton set is optional, and as long as non-f-ISRs can be accounted for.¹⁵

Onea and Geist (2011) propose that Schwarzschild's domain narrowing be implemented as referential anchoring to discourse items, an operation of pragmatic enrichment whereby Skolem functional dependencies may be introduced pragmatically into the restriction of the indefinite. Like Schwarzschild (2002), Onea and Geist assume that indefinites are existential quantifiers. Like Kratzer (1998), they assume pragmatically-triggered Skolem functions may operate on their domain. Functional and non-functional readings may be generated in this account (non-functional readings are treated as a special case of functional readings, which don't arise from natural or nameable functions). Referential anchoring may be conventionalized, and thus may become part of the lexical contribution of indefinites, such as Russian *wh-to* and *koe-wh*. In their account, *koe-wh* lexicalizes a constraint whereby referential anchoring is restricted to the speaker and what the speaker has in mind, giving rise to WSRs only. The referential anchoring of *to-wh* indefinites is not necessarily bound to the speaker, though it may be. If it is bound by a c-commanding quantifier, *wh-to* imposes the constraint that the function must be nameable—Onea and Geist argue that this generates WSRs and f-ISRs only for *wh-to*. This proposal falls short of the empirical picture we have uncovered in this study for *koe-wh*, since non-WSRs are possible for this indefinite as long as they are functional—their analysis for *wh-to* seems better suited for *koe-wh*. The mechanism that generates f-ISRs in fact also generates f-NSRs, contrary to Onea and Geist's claims, since nothing in their account blocks it from taking place when just two quantifiers are involved—so the properties of *koe-wh* would be account for indeed. If, as we have shown, *wh-to* gives rise to all scopal readings, this indefinite is better treated as an unconstrained indefinite in this account.

Brasoveanu and Farkas' (2011) account, implemented within an independence friendly first order logic, relies on the notion of variable independence and on the idea that indefinites are special because they are capable of choosing which variables they are (in)dependent of (an idea which is reminiscent of choice function approaches). It is part of the interpretation of an existential quantifier that that it must make a choice regarding its evaluation with respect to the variables introduced by c-commanding quantifiers. Wide scope is characterized as independence of the indefinite's choice from the variables provided by c-commanding quantifiers, while intermediate and narrow scope involve dependence on those variables. An indefinite may impose different constraints on this (in)dependence. Which particular variables from those thus made available is chosen is not a syntactic choice—thus, syntactic islands have no role to play here, correctly. Non-

¹⁵ As suggested by an anonymous reviewer, whom we thank for pointing out this possibility to us, this may be done with von Stechow's (1999, 2000) domain restriction via subset selection functions, which may be singleton and which may be optionally existentially closed off at intermediate levels.

indefinite quantifiers express relations between sets and do not allow variable choice—hence, their scope is constrained differently, also correctly. Wide, intermediate and narrow scope readings of an indefinite are three different ways of interpreting the relation between the index of evaluation of the indefinite and the variables introduced by higher quantifiers. If there are two such quantifiers Q_x and Q'_y , where Q_x c-commands Q'_y , on making a choice for its index of evaluation, the indefinite can choose no variables to be dependent on. This entails that it will be independent of both x and y , with the effect that, no matter what the value of x and y , the values of the indefinite are fixed—this gives rise to widest scope. The indefinite can instead make its choice of evaluation index dependent on x —this entails but it will be independent of y . In this case, the indefinite co-varies with x , but is fixed with respect to y , giving rise to an ISR. The third possibility is for the indefinite to choose its index of evaluation to be dependent on both x and y , in which case it will co-vary with both of the variables, giving rise to a NSR.

In this account, an indefinite like Russian *wh-to* is a clear case of an unmarked indefinite: it allows co-variation but imposes no constraints on its choice of evaluation index, allowing all readings. Functional interpretations for *wh-to* are not separate interpretations—a systematic relationship between the value of the indefinite and the variable(s) it co-varies, and hence, depends on, is possible, but not necessary, for *wh-to*, which is the correct empirical result. Brasoveanu and Farkas argue that the semantic contribution of dependent indefinites, such as *wh-nibud'* indefinites in Russian, is that they have to choose at least one variable to depend on, which ensures co-variation. They hypothesize that this additional pro-variation/anti-fixed-value constraint is precisely the contribution of the special dependent morphology we observe for dependent indefinites. This analysis predicts both the scopal behavior of *wh-nibud'* indefinites and their licensing requirement (if they must co-vary, then a c-commanding quantifier has to provide the variables with which they co-vary).¹⁶ For *koe-wh* indefinites, we can follow Brasoveanu and Farkas' (2016) account of English *a certain*: *koe-wh* adds a constraint to the effect that its index of evaluation chooses variables relative to a suitable function F ; as in Kratzer (1998), and for the reasons discussed in Schwarz (2001, 2011), F is free variable assigned a value by the context/speaker. Given a c-commanding quantifier Q_x , as in (21), *koe-wh* gives rise to an f-NSR with respect to Q_x when it chooses its index of evaluation to depend on x , which ensures that the value of the indefinite, let us call it y , co-varies with x :

(21) $Q_x \dots [\dots koe-wh^x y \dots]$

In addition, the values of y are constrained, as they have to be provided by a suitable function F : given any co-varying x and y , $F(x)=y$. A quantifier Q'_z c-commanded by Q_x need not change the relation between Q_x and *koe-wh*, and in such a case a f-ISR obtains:

(22) $Q_x \dots Q'_z \dots [\dots koe-wh^x y \dots]$

¹⁶ Contra Geist (2008) and Yanovich (2005), an account of *wh-nibud'* indefinites in terms of choice functions does not seem adequate. That is because a choice function account alone cannot ensure co-variation—the individual picked by the choice function can, but is not forced to, vary according to the higher quantifier that binds *wh-nibud'*.

Koe-wh gives rise to a WSR when it chooses to have no variables to depend on (indicated by the empty set symbol in (23)), and, in addition, it requires there to be a suitable function F such that it has y as its only value— F is just the individual y in this case:

$$(23) Q_x \dots (Q'_z) \dots [\dots koe-wh^{\emptyset}_y \dots]$$

In general, functional indefinites in this account constrain the choice of variable they depend on by means of a functional dependency.

Onea's (2015) account of indefinite scope can be seen as a modern version of the existential closure analysis of Reinhart (1997) combined with a modern version of Abusch's (1994) storage mechanism, designed to avoid the so-called *Donald Duck problem* and the problem discussed by Chierchia (2001) and Schwarz (2001, 2011) for Reinhart's freedom of existential closure. Onea proposes that assignment variables are at the core of the semantic interpretation process. It is these assignment variables that are existentially quantified over by a propositional-level existential operator, which will be ultimately responsible for the variable scope of indefinites. Denotations of expressions are functions from assignments to other functions or entities. The interpretation of a sentence like *Every professor sleeps* is as in (24), for h an assignment from indices to individuals:

$$(24) [[\text{Every}_1 \text{ professor sleeps}]] = \forall h \text{ professor}(h(1)) \rightarrow \text{sleep}(h(1))$$

That is, all assignments where the individual they pick for the index 1 is a professor are also assignments where that individual sleeps. This is equivalent to the standard first order logic rendition. Indefinites are partial functions from assignments to individuals, and not (existential) quantifiers. For example, the denotation of the indefinite *a professor* is as in (25), where material in square brackets imposes referential constraints and makes the expression a partial function. In the case at hand, the constraint is that the individual assigned to the index 1 be a man:

$$(25) [[a_1 \text{ professor}]] = \lambda g [\text{professor}(g(1))].g(1)$$

Referential constraints are passed up the tree via the interpretation function. To see how the scope of an indefinite over a quantifier is derived, consider (26) (square brackets in syntactic representations indicate structure), where the indefinite *a professor* is inside the restrictor of *every article*, and thus, inside of a relative clause island:

$$(26) \text{John read } [\text{every}_1 \text{ article } [\text{that } a_2 \text{ professor recommended}]]$$

The WSR of (26) in this account is as in (27):

$$(27) \exists h. \text{ professor}(h(2)) \ \& \ \forall h' \text{ article}(h'(1)) \ \& \ \text{recommend}(h(2), h'(1)) \rightarrow \text{read}(h'(1), \text{John})$$

This says that there is an assignment h such that the individual it picks for the index 2 is a professor, and for all assignments h' where the value they pick for the index 1 is an article and the professor picked by h recommended the article, John read the article. The existential quantification over assignments is what allows the indefinite to take scope outside of the relative clause. Referential constraints and their inheritance up the tree is

what allows the restriction of the indefinite not to remain *in situ* in the interpretation, thus avoiding the Donald Duck problem. Existential closure of the relevant assignment variable inside of the island gives rise to a NSR. In a configuration with a quantifier in subject position, as in (28) (cf. (1)), and ISR arises when the existential operator over assignments applies at the level of the embedded clause:

(28) Every₃ student read [every₁ article [that a₂ professor recommended]]

The reader is referred to Onea’s paper (see also Onea 2016) for the many details this very brief sketch puts aside. However, it is possible to see that the readings that *wh-to* indefinites give rise to can be derived in exactly the same way as just described—these will not be functional readings, but we don’t need to generate functional readings for *wh-to*, as the readings otherwise generated for it are compatible with there being a systematic relationship between, say, students and professors. Since Onea’s system is designed to generate all of WSRs, ISRs and NSRs, and since *wh-to* allows all of these readings, *wh-to* does not pose a challenge for this theory. Regarding both *koe-wh* and *wh-nibud’* indefinites, Onea (2016) argues for a treatment in which *koe-* and *-nibud’* are markers of special relationships between the sentence they find themselves in and potential questions in discourse, an idea implemented within a general theory of the role of potential questions in discourse. In this approach, *koe-wh* signals that the speaker is able but not willing to answer the question of the identity of the indefinite’s referent, which accounts the secretive component associated with this indefinite introduced in section 2, and from which WSRs are derived. On the other hand, *wh-nibud’* signals that no sensible potential question is raised, which, Onea argues, derives its narrow scope tendencies, its licensing requirement, and its epistemic component. One question that arises in this framework is whether the distribution of functional and non-functional readings for these indefinites can be predicted in a systematic fashion, an issue we leave for further research.¹⁷

As we can see, accounts, old and new, differ in the kind and number of additional assumptions they have to make in order to account for the behavior of *koe-wh* and *wh-to* indefinites that we described in section 3. We hope this section has helped to map out to some degree the theoretical commitments that an account of Russian indefinite scope is bound to need.

5 Conclusion

This paper has contributed to our understanding of the cross-linguistic typology of indefinites by showing that Russian *koe-wh* indefinites, contra much previous literature, allow functional readings in addition to exceptional wide scope readings, thus establishing the validity of the indefinite category represented by English *a certain* across languages. In particular, contrary to standard assumption, *koe-wh* indefinites do allow ISRs and NSRs when functional. Our data, collected experimentally, also shows that *wh-to* indefinites are truly unmarked with respect to scope and functional readings, allowing all possible readings—they are a clearer case of an unmarked indefinite than English *a*, which does not allow for functional readings. We also discussed how our data may be

¹⁷ We are aware of at least one other theory of exceptional indefinite scope that deserves discussion, that in Charlow (2014). However, the proper discussion of the assumptions and mechanisms that this theory uses to derive indefinite scope, and how they apply to the Russian data, require more space than we have here, so we leave its consideration for a future occasion.

accounted for in a number of different approaches, highlighting the additional assumptions these approaches have to introduce in order to account for the behavior of the two indefinites as we went along.

Acknowledgements

We are grateful to Tatiana Luchkina, Barbara Partee and Natalia Slioussar for their invaluable assistance with the data collection, to Tatiana Luchkina and Sea Hee Choi for the data entry, and to Svitlana Antonyuk, Edgar Onea, audiences at the London Semantics Day 2015, the 25th Colloquium in Generative Grammar in Bayonne, France, the XPrag 2015 in Chicago, USA, and three anonymous reviewers for extremely insightful comments, suggestions and questions. This study was funded by a Small Research Grant from the British Academy/Leverhulme Trust and by a University of Illinois Campus Research Board grant.

Competing interests

The authors have no competing interests to declare.

References

- Abusch, Dorit. 1994. The Scope of Indefinites. *Natural Language Semantics* 2, 83-136. <https://doi.org/10.1007/BF01250400>
- Aloni, Maria and Angelika Port. 2015. Epistemic Indefinites and Methods of Identification. In Luis Alonso-Ovalle and Paula Menéndez-Benito (2015), 117-140.
- Alonso-Ovalle, Luis and Paula Menéndez-Benito (2015) *Epistemic Indefinites. Exploring Modality Beyond the Verbal Domain*, Oxford University Press: Oxford.
- Bates, Douglas, Martin Mächler, Ben Bolker and Steve Walker. 2015. Fitting linear mixed-effects models using lme4. *Journal of Statistical Software* 67, 1-48. 10.18637/jss.v067.io1
- Brasoveanu, Adrian and Donka Farkas. 2011. How Indefinites Choose their Scope. *Linguistics and Philosophy*, 34, 1-55. <https://doi.org/10.1007/s10988-011-9092-7>
- Brasoveanu, Adrian and Donka Farkas. 2016. Indefinites. In Maria Aloni and Paul Dekker (eds.) *The Cambridge Handbook of Formal Semantics*, Cambridge University Press, 238-266
- Breheny, Richard. 2003. Exceptional Scope Indefinites and Domain Restriction. In Matthias Weisgerber (ed.), *Proceedings of Sinn und Bedeutung 7*, Arbeitspapier Nr. 114, FB Sprachwissenschaft, 38-52, Universität Konstanz.
- Carlson, Greg. 1977. Reference to kinds in English. PhD dissertation, University of Massachusetts, Amherst
- Charlow, Simon. 2014. *On the Semantics of Exceptional Scope*. PhD dissertation, New York University
- Chierchia, Gennaro. 2001. A Puzzle about Indefinites. In Carlo Cecchetto, Gennaro Chierchia, and Maria Teresa Guasti (eds.), *Semantic interfaces: Reference, anaphora, and aspect*. Stanford: CSLI.
- Dahl, Östen. 1970. Some Notes on Indefinites. *Language* 46, 33-41. 10.2307/412405
- Ebert, Christian, Cornelia Endriss and Stefan Hinterwimmer. 2007. Embedding Topic-Comment Structures Results in Intermediate Scope Readings. In Anisa Schardl, Martin Walkow and Muhammad Abdurrahman (eds.), *Proceedings of NELS 38*, vol. 1., 246-259, GLSA Publications

- Ebert, Christian, Cornelia Endriss and Stefan Hinterwimmer. 2013. The Interpretation of the German Specificity Markers *Bestimmt* and *Gewiss*. In Christian Ebert and Stefan Hinterwimmer (eds.) *Different Kinds of Specificity Across Languages*, Springer, 31-75.
- Endriss, Cornelia. 2009. *Quantificational Topics. A Scopal Treatment of Exceptional Wide Scope Phenomena*. Studies in Linguistics and Philosophy 86. Springer
- Eremina, Olga. 2012. *The Semantics of Russian Indefinite Pronouns: Scope, Domain Widening, Specificity and Proportionality and their Interaction*. PhD dissertation, Michigan State University
- Farkas, Donka. 1997. Dependent Indefinites. In Francis Corblin, Danièle Godard & Jean-Marie Marandin (eds.), *Empirical Issues in Syntax and Semantics*, 243–267. Bern: Peter Lang.
- Farkas, Donka. 2002. Extreme Non-Specificity in Romanian. In Claire Beyssade (ed.), *Romance languages and linguistic theory 2000*, 127–151. Amsterdam: John Benjamins.
- von Fintel. Kai. 1999. Quantifier Domain Selection and Pseudo-Scope. Talk presented at the Context Dependence Conference, Cornell University.
- von Fintel. Kai. 2000. Singleton Indefinites (re. Schwarzschild 2000), ms., MIT
- Fodor, Janet and Ivan Sag. 1982. Referential and Quantificational Indefinites. *Linguistics and Philosophy*, 5, 355-398. <https://doi.org/10.1007/BF00351459>
- Geist, Ljudmila. 2008. Specificity as Referential Anchoring: Evidence from Russian. In A. Grønn (ed.), *Proceedings of Sinn und Bedeutung 12*, 151-164. Oslo: ILOS
- Haspelmath, Martin. 1997. *Indefinite Pronouns*. Oxford: Oxford University Press.
- Henderson, Robert. (2014) Dependent Indefinites and their Post-Suppositions. *Semantics and Pragmatics*, 7, 1-58. <http://dx.doi.org/10.3765/sp.7.6>.
- Hintikka, Jaakko. 1986. The Semantics of *a certain*. *Linguistic Inquiry* 17, 331-336.
- Ionin, Tania. 2010. The Scope of Indefinites: an Experimental Investigation. *Natural Language Semantics*, 18, 295-350. <https://doi.org/10.1007/s11050-010-9057-3>
- Ionin, Tania. 2015. Certain Properties of Certain Indefinites: an Experimental Perspective. In Luis Alonso-Ovalle and Paula Menéndez-Benito (2015), 183-210.
- Jayez, Jacques and Lucia Tovenca. 2006. Epistemic Determiners. *Journal of Semantics*, 23, 217-250. <https://doi.org/10.1093/jos/ffl002>
- Kagan, Olga. 2011. On Speaker Identifiability. *Journal of Slavic Linguistics* 19, 47-84
- Kratzer, Angelika. 1998. Scope or Pseudo-scope: Are there Wide-scope Indefinites? In Susan Rothstein (ed.), *Events in Grammar*, 163-196. Dordrecht: Kluwer.
- Kratzer, Angelika. 2003. A Note on Choice Functions in Context, ms. University of Massachusetts Amherst
- Kratzer, Angelika and Junko Shimoyama. 2002. Indeterminate Pronouns: The View from Japanese. In Yukoi Otsu (ed.), *The Proceedings of the Third Tokyo Conference on Psycholinguistics*, 1-25. Tokyo: Hituzi Syobo.
- Lenth, Russell. 2016. Least-squares means: The R package lsmeans. *Journal of Statistical Software* 69, 1-33. 10.18637/jss.v069.i01
- Martí, Luisa. 2007. Restoring Indefinites to Normalcy. An Experimental Study on the Scope of Spanish ‘*algunos*’, *Journal of Semantics*, 24, 1-25. <https://doi.org/10.1093/jos/ffl010>
- Matthewson, Lisa. 1999. On the Interpretation of Wide-scope Indefinites. *Natural Language Semantics* 7, 79-134. <https://doi.org/10.1023/A:1008376601708>
- Onea, Edgar. 2015. Why Indefinites can Escape Scope Islands. *Linguistics and Philosophy* 38, 237-267. <https://doi.org/10.1007/s10988-015-9167-y>
- Onea, Edgar. 2016. Potential Questions at the Semantics-Pragmatics Interface. *Current Research in the Semantics/Pragmatics Interface* 33. Brill

- Onea, Edgar and Ljudmila Geist. 2011. Indefinite Determiners and the Pragmatics of Referential Anchoring. *International Review of Pragmatics* 3, 194-227. [10.1163/187731011X597514](https://doi.org/10.1163/187731011X597514)
- Paducheva, Elena. 1985. *Vyskazyvanie i ego sootnesennost' s dejstvitel'nost'ju. The statement and its correlation with reality*. Moscow: Science
- Pereltsvaig, Asya. 2000. Monotonicity-Based vs. Veridicality-Based Approaches to Negative Polarity: Evidence from Russian. *Formal Approaches to Slavic Linguistics* 8, 328-346
- Pereltsvaig, Asya. 2008. Russian *nibud'*-series as Markers of Co-Variation. In Natasha Abner and Jason Bishop (eds.), *Proceedings of the 27th West Coast Conference on Formal Linguistics*, 370-378, Somerville, MA: Cascadilla Proceedings Project.
- Portner, Paul. 2002. Topicality and (non)-Specificity in Mandarin. *Journal of Semantics* 19, 275-287. <https://doi.org/10.1093/jos/19.3.275>
- Portner, Paul and Katsuhiko Yabushita. 1998. The Semantics and Pragmatics of Topic Phrases. *Linguistics and Philosophy* 21, 117-157. <https://doi.org/10.1023/A:1005311504497>
- Portner, Paul and Katsuhiko Yabushita. 2001. Specific Indefinites and the Information Structure Theory of Topics. *Journal of Semantics* 18, 221-297. <https://doi.org/10.1093/jos/18.3.271>
- R Core Team. 2014. R: A language and environment for statistical computing. Vienna, Austria: R Foundation for Statistical Computing. <http://www.r-project.org/>
- Reinhart, Tania. 1997. Quantifier Scope: How Labor is Divided between QR and Choice Functions. *Linguistics and Philosophy* 20, 335-397. <https://doi.org/10.1023/A:1005349801431>
- Schlenker, Philippe. 2006. Scopal Independence: a Note on Branching and Wide Scope Readings of Indefinites and Disjunctions. *Journal of Semantics* 23: 281-314. <https://doi.org/10.1093/jos/ffl005>
- Schwarz, Bernhard. 2001. Two Kinds of Long Distance Indefinites. In Robert van Rooy and Martin Stokhof (eds.), *Proceedings of the Thirteenth Amsterdam Colloquium*, 192-197. Universiteit van Amsterdam: Institute for Logic, Language and Computation.
- Schwarz, Bernhard. 2011. Long Distance Indefinites and Choice Functions. *Language and Linguistics Compass* 5, 880-897. [10.1111/j.1749-818X.2011.00315.x](https://doi.org/10.1111/j.1749-818X.2011.00315.x)
- Schwarzschild, Roger. 2002. Singleton Indefinites. *Journal of Semantics* 19, 289-314. <https://doi.org/10.1093/jos/19.3.289>
- Singmann, Henrik, Ben Bolker, Jake Westfall and Frederik Aust. 2016. afex: Analysis of factorial experiments. R package version 0.16-1. <https://CRAN.R-project.org/package=afex>
- Winter, Yoad. 1997. Choice Functions and the Scopal Semantics of Indefinites. *Linguistics and Philosophy* 20, 399-467. <https://doi.org/10.1023/A:1005354323136>
- Yanovich, Igor. 2005. Choice-functional Series of Indefinites and Hamblin Semantics. In Efthymia Georgala and Jonathan Howell (eds.) *Proceedings of Semantics and Linguistic Theory* 15, 309-26. Cornell University, Ithaca, NY: CLC Publications.