Lecture 8. Quantification and Interactions with Negation; Monotonicity, and Negative Polarity Items

0. NPIs in the context of Typology of Indefinites, Russian indefinites

1. Negative polarity items. (“NPI’s”).

0.  NPIs in the context of Typology of Indefinites, Russian indefinites

1. Negative polarity items. (“NPI’s”).

2. Pereltsvaig 2000 on Russian NPI’s.

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Appendix 1. Recursive definition of "c" on semantic types that "end with a t".

Appendix 2: Pereltsvaig’s suggested list of Russian idiomatic NPI’s.

Appendix 3: Charts and environments for testing NPIs – handed out separately.

References.

Suggested readings: (full references in References section at the end)

(selections from Paducaheva 1974, selections from Paducaheva 1985)


(Larson 1995) (handed out in Week 1)

(Pereltsvaig 2000) (handed out today and on your CD)

(Tatevosov 2002) (on your CD; most relevant for NPI’s – 131-143 and 156-163)

(Parate and Borschev 2002) (available online: http://people.umass.edu/partee/docs/ParateBorschevFASL10.pdf)

(Werle 2001, Werle to appear) (both Werle papers are on the class CD, also online:

(Werle 2004, Werle to appear)

http://www.pereltsvaig.com/professional/publications/publications.html

(Ladusaw 1980) (classic; on your CD)

0. NPIs in the context of Typology of Indefinites, Russian indefinites.

Today we will introduce the notion of “negative polarity items”, expressions that can only occur in “negative contexts.” And we will put it into the broader context of different kinds of indefinites and the puzzles of their semantics and their distribution: Russian is particularly rich in the distinctions it makes among, for instance, niko, kto-libo, kto-nibud'; kto-to, koe-kto, kto by to ni bylo. In Lecture 4 and Lecture 6 (which went on for two weeks) we discussed some typological perspectives on this broader range of items, building especially on work of Haspelmath (1997) and Tatevosov (2002), with special attention to Russian.

You have access to Haspelmath’s book and Tatevosov’s book online. You can find a good summary of the central ideas of Haspelmath’s book in Tatevosov’s book, especially pages 134-144.

1. Negative polarity items. ("NPI’s").

In English there are negative polarity items (NPI’s) which are restricted to occurring in certain contexts, of which “negative contexts” are typical “licensing” contexts, but not the only contexts. The linguistic problem is to characterize the nature of the contexts in which NPI’s can and cannot occur (and to characterize the NPI’s, but we will not try to do that here.)

Examples: any, anyone, anything, anywhere, ever, at all; give a damn, lift a finger, move a muscle, pay the slightest attention. Question: what are some Russian NPI’s? (See Section 3 and homework exercises. There is some discussion of NPI’s in Slavic languages in (Brown 1999), (Pereltsvaig 2000, 2004), (1994, 2000, Progovac 1998, 1991, 1993), (Tatevosov 2002); see also Pereltsvaig’s list in Appendix I, and materials online from preliminary answers to some of these questions from the class at RGGU in 2004:

1. Classification of Pereltsvaig’s list of Russian idiomatic NPI’s: Reflecting judgments of colleagues and students, some are frozen idioms, some require clause-negation, some occur in broad NPI environments, some were judged not to be NPIs at all.


2. Minimal Unit Idioms, Quantifying Superlatives, and their Contexts: Notes on discussion in class April 22 and comments received afterwards. Findings: kapla and kopejka occur in the full range of NPI contexts; they also occur with a positive interpretation 'just a little' in non-specific irrealis contexts. Quantifying superlatives appear to have pretty much the same ranges. Examples collected by students. A few notes on the contributions of the scalar focus particles i and xo'.

http://people.umass.edu/partee/RGGU_2004/Notes%20from%20April%2022%20RGGU%20on%20%20Negative%20Polarity%20and%20other%20Indefinite%85.pdf

Notes on Semantics Homework #4 about NPIs and other Indefinites. Thanks to Diana Forker, Ivan Zakaryaschev, Julia Morozova, Lena Ospenkovskaya, Marina Khoruzhenko, Yura Lander, Elena Rudinskaya, Igor Yanovich, Elena Paducheva, Vladimir Borschev, Yakov Testelets. Notes about licensing by bez ‘without’, notes about the focus particle xo’ and its role, notes about possible prototype-like behavior of some kinds of indefinites and some of their contexts; notes about multiple licensing and scope issues.

http://people.umass.edu/partee/RGGU_2004/Notes%20on%20Semantics%20Homework%20about%20%20NPIs%20and%20other%20Indefinite%85.pdf

Examples:

(1) I did not see any lions.

(2) I saw any lions.

(3) If you have any questions, you can call me.

(4) Noone has ever found a unicorn.

(5) Someone has ever found a unicorn.

(6) No student who knows anything about phonology would ever say that.

(7) *Some student who knows anything about phonology would ever say that.

(8) Every student who knows anything about phonology will know the answer.

(9) *Every student who knows phonology would ever say that.

The semantic generalization discovered by (Ladusaw 1979) is that NPI’s occur inside the argument of “monotone decreasing functions”. This notion is much more general than the notion of negation, and covers all of the above examples and many others; and it is an intrinsically model-theoretic concept — a real semantic property of the interpretation of the expressions, not a “formal” property of “representations” in some sort of “logical form”.

MGU058.doc 1

MGU058.doc 2
The distribution of polarity items in the CNP part and the VP part of the sentences (4-9) above, and others like them, is accounted for by the monotonicity properties of the determiners in them. This account reinforces the analysis of determiners as functions which take a CNP as first argument, and the resulting NP interpretation (a generalized quantifier) as a function which takes the VP as its argument.


### 2. Pereltsvaig 2000 on Russian NPI’s.

#### 2.1. Introduction

Pereltsvaig (2000) has two main goals: (i) to describe the distribution of some PSI’s (“Polarity sensitive items”, a larger class including NPIs) in Russian, in particular ni-words, -libo-words, and –nibud’ words; (ii) to compare the monotonicity-based approach of Ladusaw with the veridicality-based approach of Zwarts (1995) and Giannakidou (1998, 1997). She concludes that the monotonicity-based approach works better for the Russian words she examines. (But she agrees that the veridicality-based approaches can be useful for relating NPIs, “free choice indefinites”, and the selection of mood. Veridicality is closely related to the notions of realis, irrealis.)

#### 2.2. Data

(I include an abbreviated list in the handout, because you have the article.)

<table>
<thead>
<tr>
<th>ni-series</th>
<th>libo-series</th>
<th>nibud’-series</th>
</tr>
</thead>
<tbody>
<tr>
<td>никто</td>
<td>кто-либо</td>
<td>кто-нибудь</td>
</tr>
<tr>
<td>некуда</td>
<td>куда-либо</td>
<td>куда-нибудь</td>
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<tr>
<td>никогда</td>
<td>когда-либо</td>
<td>когда-нибудь</td>
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<tr>
<td>никакой</td>
<td>какой-либо</td>
<td>какой-нибудь</td>
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Preliminary classification: Strong NPIs, Weak NPIs, Narrow scope non-specific PSI’s

English any-NPIs are sometimes translated by Russian ni-words and sometimes by Russian –libo-words. English negative quantifiers (n-words like no one, nothing, never) are translated by Russian ni-words but those must be accompanied by clausal sentential negation neg.

What are Russian ni-words? Are they like English n-words? No; (a) they never occur without ne, and (b) two Russian ni-words never “make a positive”, which English n-words do, at least sometimes1. (There’s an advertisement that plays with this fact: “Nobody doesn’t like Sara Lee” (a kind of cake).) But they also aren’t like English any-words, because their distribution is much more restricted: they require clausal sentential negation.

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1 There are colloquial varieties of English in which n-words behave more nearly like Russian ni-words, and like the negative words in Spanish, Italian, and many other languages. Black English is one such variety, but by no means the only one.
(1) a. CLAUSEMATE SENTENTIAL NEGATION. (These are all from Pereltsvaig 2000)

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k. PHRASAL COMPARATIVE.

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l. INTERROGATIVES.

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All the contexts above are “downward entailing” (monotone decreasing). It takes a considerable amount of work to show why, formally, but you can test all of them by trying out subset-superset pairs in the place of the ni- or –libo word. For example:

(2) Testing the context “in the scope of only”:

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Note: we have to assume that the presuppositions of both sentences are satisfied when we do the test. That means we have to accept the presupposition that Adam arrived before 14:15. And in that case, the entailment is valid, and it shows that only creates a downward-entailing context (in its second argument).

There are some other contexts that license English any that are not downward-entailing, but which involve some sort of “irrealis” context. These do not license –libo-words. (Pereltsvaig, p. 333). These contexts do license –nibud’ words.

(3) a. IMPERATIVE.

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b. FUTURE.

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c. MODAL – POSSIBILITY.

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d. MODAL – NECESSITY.

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Summary of distribution.

<table>
<thead>
<tr>
<th>CONTEXT</th>
<th>ni-series</th>
<th>-libo-series</th>
<th>nibud’-series</th>
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<tbody>
<tr>
<td>Clausemate sentential negation</td>
<td>OK</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Weak negative contexts (1b-l)</td>
<td>*</td>
<td>OK</td>
<td>? (variation)</td>
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<tr>
<td>Irreals non-specific contexts (3)</td>
<td>*</td>
<td>*</td>
<td>OK</td>
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</table>
2.3 Comparison of the Theories.

2.3.1. The Monotonicity-based approach.

Pereltsvaig gives definitions that are consistent with the ones given earlier in this handout. She gives additional mention to some related stronger properties than monotonicity, principally “antimorphic”, which requires that \( f(X \cap Y) = f(X) \cup f(Y) \) and \( f(X \cup Y) = f(X) \cap f(Y) \). Contexts which are antimorphic include clausemate sentential negation, as well as subject NPs like not John.

2.3.2. The Veridicality-based approach.

The veridicality-based approach comes from the work of Zwarts (1995) and Giannakidou (1998, 1997). Its goal is to consider a broader class of PSIs, and to relate NPs, “free choice indefinites”, and the selection of mood (primarily subjunctive vs. indicative). Veridicality is closely related to the notions of realis, irreals.

Here is an example (this is not in Pereltsvaig, but is discussed in some of the work she refers to) of a phenomenon that is not an NPI phenomenon but that may relate to veridicality: In Spanish, there are two ways to say “John is looking for a professor who speaks Catalan”, depending on whether the description a professor who speaks Catalan is understood as referring to a specific professor (the de re) reading, or as an attributive description not tied to any particular referent (the de dicto reading). In the first case the verb in the relative clause is in the indicative mood; in the second case it is subjunctive.

(4) a. Juan busca a un profesor que habla catalán.
   Juan seeks a professor that speaks-INDIC Catalan
   Juan is looking for a (specific) professor who speaks Catalan.
 b. Juan busca a un profesor que hable catalán.
   Juan seeks a professor that speaks-SUB/JUNC Catalan
   Juan is looking for a (any) professor who speaks Catalan.

Pereltsvaig gives the following definition of (non)veridicality, from Giannakidou (1998).

(12) Let \( Op \) be a monadic propositional operator. Then:

(i) \( Op \) is veridical just in case \( Op p \rightarrow p \) is logically valid. Otherwise \( Op \) is nonveridical.

(ii) A nonveridical operator \( Op \) is antiveridical just in case \( Op p \rightarrow \neg p \) is logically valid.

As illustrated in (13), yesterday is a veridical operator, perhaps is nonveridical, and not is antiveridical. (Compare our earlier classification of adjectives – veridical corresponds to subjective, antiveridical corresponds to subjective-antiveridical, and nonveridical corresponds to ‘no meaning postulate’: plain non-subjective.)

(13) a. Dharma kissed Greg yesterday \( \rightarrow \) Dharma kissed Greg.
 b. Perhaps Dharma kissed Greg \( \rightarrow\rightarrow \) Dharma kissed Greg.
 c. Dharma did not kiss Greg \( \rightarrow \) It is not the case that Dharma kissed Greg.

According to the Veridicality-based approach, different PSI’s may be licensed or “anti-licensed” (i.e. prohibited from occurring) by veridicality, non-veridicality, or antiveridicality. English any, which occurs not only in downward-entailing environments but also (so-called “free-choice” any) in some modal contexts, is claimed to be anti-licensed by veridicality. That doesn’t mean that it’s licensed in all non-veridical contexts, but that it’s definitely bad in veridical contexts. (More must be said, of course.)

2.3.3. Russian PSIs: Monotonicity or Veridicality?

First consider the ni-words. They require clausemate sentential negation. But that cannot be defined simply in terms of either the MBA (monotonicity-based approach) or the VBA (veridicality-based approach).

Can we use the stronger property of antimorphic? Clausemate sentential negation is indeed an antimorphic context, but so are “not John” and complements of without, and they don’t admit ni-words. So the MBA doesn’t work. What about VBA? No: clausemate negation is antiveridical, but so are many other contexts, including those same two, plus comparatives and antecedents of counterfactual conditionals. So in any case something more must be said.

Pereltsvaig’s own proposal: ni-items require a licensor which is semantically antimorphic and which is syntactically in a specific position (in a “Polarity Phrase” near the top of the syntactic tree), at the level of “LF”.

Next she considers –libo words. As summarized in her Table 3 (not reproduced here), –libo items are ungrammatical with clausemate sentential negation, and in imperative, future, and modal constructions, as well as in affirmative contexts that do not contain a downward monotone operator. Thus –libo words have a clear and simple analysis in terms of monotonicity, with just one exception. The licensing of –libo items: –libo items are licensed by a downward monotonic operator. In the context of clausemate sentential negation, they are in competition with ni-items, which are licensed more narrowly. Because the ni-items have more specific lexical entries, they have priority. The VBA cannot account for the distribution of –libo items. They can occur in some antiveridical contexts but not all (not clausemate sentential negation), and they can occur in some contexts that are monotone decreasing but not antiveridical: antecedents of non-counterfactual conditionals, too-constructions, and complements of negative predicates like doubt.

We can’t claim that they are licensed by nonveridicality, because they are bad in some contexts that are nonveridical but not monotone decreasing: imperatives, future, modals.

Finally, what about –nibud’ items? They are polarity-sensitive in that they also cannot occur in simple past-tense affirmative sentences:

(13) a. Dharma kissed Greg yesterday \( \rightarrow \) Dharma kissed Greg.
   Dharma did not kiss Greg
   Perhaps Dharma kissed Greg
   Dharma did not kiss Greg

Two possible analyses: (i) nibud’ items are anti-licensed by upward monotonicity.
   (ii) nibud’ items are not polarity-sensitive items at all, but are sensitive to the presence of an operator with respect to which they can take narrow scope. Pereltsvaig favors this second approach, but agrees that much more work is needed on nibud’ items.

2.4 Pereltsvaig’s Conclusion.

Pereltsvaig has argued that neither monotonicity nor veridicality alone can account for the distribution of Russian ni and libo items. But she has argued that a combination of the monotonicity
approach with (a) syntactic constraints on the licensing of *ni*-words and (b) morphological blocking principles to capture the competition between *ni*-words and *libo*-words can indeed capture the distribution of those items. More work is needed on the –*nibud*’ words.

3. From Haspelmath 1997 on Typology of Indefinites

From (Haspelmath 1997). We discussed some of Haspelmath earlier, and you have his book on your CD.

p.36: We have already seen in the preceding section that direct negation and indirect negation are two functions that must be distinguished. In addition to indefinites that can only be used in the scope of (direct or indirect) negation, there are also indefinites that are used in the other negative polarity contexts but cannot be used in the contexts of direct negation. Such a case is the Russian –*libo* series:

(55) Ja ne videla ‘kogo-*libo* / nikogo.
    I not saw whom-INDEF / INDEF- whom
    ’I didn’t see anyone.’

(56) (a) Znajut li oni čto-*libo* ob ozonnoj dyre?
    know Q they what-INDEF about ozone hole
    ‘Do they know anything about the ozone hole?’

(b) Esli ty skazeš konu-*libo*, my tebja nakažem.
    if you tell whom-INDEF we you punish
    ‘If you tell anyone, we’ll punish you.’

(c) Malo kto pokazyvaet kakoj-*libo* interes v ètom.
    few who shows which-INDEF interest in this
    ‘Few people show any interest in it.’

p. 44-45: As we shall see in Chapter 4, there are quite a few languages in which the same indefinite pronoun is used both in irrealis non-specific contexts (e.g. imperatives, future, modality, ’want’, etc.) and in negative polarity environments. …

   When an indefinite phrase is in the scope of negation, it is necessarily non-specific. Some languages use their usual non-specific indefinites in negative contexts as well, e.g. Greek.

(95) Modern Greek

(a) Direct negation
   Dhen ídha kanéna.
   not I: saw anyone
   ‘I didn’t see anybody.’

(b) Implicit negation
   Xoris na dho kanéna ...
   without sbjv I see anyone
   ‘Without seeing anybody …’

(c) Superordinate negation
   Dhen pistévo pos kanénas irthe.
   not I: believe that anyone came
   ‘I don’t think that anyone came.’

However, many other languages use special indefinites in negative contexts, either special negative pronouns (§ 3.2.1), or other specialized indefinites. Thus Russian –*nibud*’-indefinites cannot be used in sentences like (95a-c), and Lithuanian *nors*-indefinites cannot be used for direct negation as in (95a).

…

We can now summarize the contexts where specific and non-specific indefinite phrases are allowed, as in Fig 3.1. In one type of contexts, only specific indefinites are possible, in another type both are possible but there is a meaning difference, and in a third type, only non-specific indefinite phrases are allowed. Negative polarity overlaps only partially with this third type, because imperatives are not negative polarity contexts. On the basis of these semantic distinctions, we can already identify one important parameter of cross-linguistic variation: in some languages, different indefinite series distinguish between negative polarity and no negative polarity (e.g. English, Catalan, §3.2.2.), in other languages different indefinite series distinguish between specificity and non-specificity (e.g. Russian, Modern Greek, Kannada).

Summary chart page 45, Fig 3.1. Contexts for (non-)specific phrases and negative polarity

<table>
<thead>
<tr>
<th>perfective past, ongoing present</th>
<th>‘want’, future, distributive</th>
<th>imperative</th>
<th>question, conditional</th>
<th>in the scope of negation</th>
</tr>
</thead>
<tbody>
<tr>
<td>specific possible</td>
<td>specific impossible</td>
<td>(non-specific impossible)</td>
<td>non-specific possible</td>
<td>negative polarity</td>
</tr>
<tr>
<td>no negative polarity</td>
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pp. 64-65: Implicational map and map of Russian

p. 64, Fig 4.4: An implicational map for functions of indefiniteness pronoun series

<table>
<thead>
<tr>
<th>special, specific irrealis known</th>
<th>specific, unknown non-specific</th>
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<tbody>
<tr>
<td>(4)</td>
<td>(6)</td>
</tr>
<tr>
<td>question</td>
<td>indirect negation</td>
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<tr>
<td>(1)</td>
<td>(2)</td>
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<td>specific</td>
<td>specific</td>
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<tr>
<td>conditional</td>
<td>comparative</td>
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<td>(8)</td>
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<td>conditional</td>
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<td>(7)</td>
<td>(9)</td>
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<td>direct negation</td>
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p.65, Haspelmath’s map for Russian, as modified by Teselets and Bylinina, FASL 13 handout:
(with SBIs added to Haspelmath 1997:65–6; 272–3; Tatevosov 2002:141–2)

(45) to-series nibud’-series libo-series ni-series

SPECIFIC KNOWN SPECIFIC UNKNOWN INDIRECT QUESTION CONDITIONAL COMPARATIVE FREE-CHOICE

DIRECT NEGATION INREALIS NON-SPECIFIC

INREALIS NON SPECIFIC INDIRECT NEGATION

 koş-series SBIs-1 by to ni byo-series ljuboj, -ugodno series

4. From Tatevosov 2002

(Tatevosov 2002)


Существуют отрицательно-полярные единицы, которые допустимы во всех четырех типах контекстов, соответствующих функции INDIR NEG. Таково, например, английское any в примерах (6.21 a-d).

(6.21) a. I do not think that anybody will succeed in it.
b. Any hesitations have disappeared.
c. He did it without any help.
d. Few people have any objections.

Выясняется однако, что далеко не все частно-языковые кванторные слова ведут себя аналогично any. Во-первых, довольно многие отрицательно-полярные единицы могут связываться лексическим отрицанием, размещающимся в той же предикации (случай имплицитно-отрицательных глаголов и предлогов), но не могут употребляться в зависимом предложении при наличии отрицания в главном. Например, будучи приземляющим в имплицитно-отрицательных контекстах (примеры (6.22a-b)), немецкое jeder невозможно в (6.23) под отрицанием в главном предложении (‘Я не думаю’):

(6.22) a. Mit der Bestätigung des Urteils im März 1920 verhinderte Noske jede weitere Aufklärung der Tat.
С утверждением приговора в марте 1920 Носке запретил всякое дальнейшее расследование этого дела.
b. ohne jede Hilfe
без всякой помощи

(6.23) * Ich glaube nicht, dass jeder ihm helfen kann.
Я не думаю, что кто-либо может помочь ему.

Похожую дистрибуцию имеет и русское УКС всякий, которое возможно в имплицитно-отрицательных контекстах в предложениях (6.24a-b), но невозможно в предложениях (6.25), зависящим от я не думаю:

(6.24) a. без всяких затруднений
b. Отсутствуют всякие причины ненавидеть его.
(6.25) *Я не думаю, что всякий знал об этом.

Точно так же, всякий запрещено и в контексте кванторных слов типа мало (*Мало кто из присутствующих имеет всякое возражения).

…. (omitting some interesting things on pp. 138-39 about differences among different ‘implicit-negative’ verbs etc. and influence of semantic class of noun – concrete vs. abstract, etc.)

Варьирование наблюдается не только в контекстах непрямого отрицания, но и в случае с функцией DIRECT NEGATION, для которой оказывается релевантной синтаксическая позиция ИГ (подлежащее vs. неподлежащее):

(6.29) a. Nobody came. (*Didn’t come.)
b. I saw nothing. || I didn’t see anything.

(6.30) a. Никто || *кто-либо || *кто бы то не было не приходил.
b. Я не вижу никаких || каких-либо || каких бы то не было причин не ходить туда.

4. From Tatevosov 2002

(Tatevosov 2002)


Существуют отрицательно-полярные единицы, которые допустимы во всех четырех типах контекстов, соответствующих функции INDIR NEG. Таково, например, английское any в примерах (6.21 a-d).

(6.21) a. I do not think that anybody will succeed in it.
b. Any hesitations have disappeared.
c. He did it without any help.
d. Few people have any objections.

Выясняется однако, что далеко не все частно-языковые кванторные слова ведут себя аналогично any. Во-первых, довольно многие отрицательно-полярные единицы могут связываться лексическим отрицанием, размещающимся в той же предикации (случай имплицитно-отрицательных глаголов и предлогов), но не могут употребляться в зависимом предложении при наличии отрицания в главном. Например, будучи приземляющим в имплицитно-отрицательных контекстах (примеры (6.22a-b)), немецкое jeder невозможно в (6.23) под отрицанием в главном предложении (‘Я не думаю’):

(6.22) a. Mit der Bestätigung des Urteils im März 1920 verhinderte Noske jede weitere Aufklärung der Tat.
С утверждением приговора в марте 1920 Носке запретил всякое дальнейшее расследование этого дела.
b. ohne jede Hilfe
без всякой помощи

(6.23) * Ich glaube nicht, dass jeder ihm helfen kann.
Я не думаю, что кто-либо может помочь ему.

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p. 140, Table 6.1: Дистрибуция КС в DIR и INDIR NEG контекстах.

<table>
<thead>
<tr>
<th></th>
<th>прямое отрицание (DIR NEG)</th>
<th>непрямое отрицание (INDIR NEG)</th>
</tr>
</thead>
<tbody>
<tr>
<td>подлежащее</td>
<td>прямое дополнение</td>
<td>отрицание в матричном глаголе</td>
</tr>
<tr>
<td></td>
<td>имплицитно-отрицательный предик</td>
<td>имплицитно-отрицательный глагол</td>
</tr>
<tr>
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<td>-</td>
<td>+</td>
</tr>
<tr>
<td>инс?</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>либо</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>бы то ни было</td>
<td>-</td>
<td>+</td>
</tr>
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<td>no</td>
<td>+</td>
<td>-</td>
</tr>
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<td>personne</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>quiconque</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>-que ce soit</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>tout</td>
<td>-</td>
<td>+</td>
</tr>
</tbody>
</table>

5. Miscellaneous possible polarity items

Other items that may be NPIs or some other kind of PSIs to consider, from discussions or miscellaneous sources.

1. i + NP , where NP denotes some “minimal unit” (i kapli, for instance)
2. ni odin, etc.
3. хот’
3. Review Pereltsvaig’s, Haspelmath’s, Tatevosov’s, and Paducheva’s claims about the distribution of “–libo” and “–nibud’” items, and make your own comments about the contexts in which those can occur. You can use the first chart in appendix 3 to fill in your own judgments, and list some examples to support your judgments of possibly disputed cases.

4. Consider some of the items in Section 5 above (also listed in Appendix 3), which may or may not be NPIs, and fill in relevant parts of the second chart in Appendix 3, and discuss, with examples. Look at results and comments from 2004 (online) and make your own contributions to the discussion.

Appendix 1. Recursive definition of “≤” on semantic types that “end with a t”.

Relevant background – (Partee and Rooth 1983), (Ladusaw 1980). (The first of these doesn’t mention monotonicity, but it defines conjunction recursively on the same family of semantic types. There are considerable formal parallels in the two recursive definitions.)

Semantic types: from the extensional part of Montague’s intensional logic

Basic types: e, t (entities, truth values)
Recursively defined functional types: If a, b are types, then <a,b> is a type. <a,b> is the type of expressions which denote functions from a-type things to b-type things.

Negation as a sentence operator is of type <t,t>. One-place predicates (nouns, some adjectives, maybe intransitive verbs) are of type <e,t>. Generalized quantifiers are of type <<e,t>,t>.

Semantic domains.
Start with a set D of entities and the set of two truth values {0,1}. Then recursively define the domain of possible denotations Da for expressions of any type a.

D0, the domain of possible denotations for expressions of type t, is {0,1}.

De, the domain of possible denotations for expressions of type e, is D.

D<e,b>, the domain of possible denotations for expressions of type <a,b>, is the set of all functions from D<e> to D0.

Now we’re ready to start the definition of “less than” that will be used in the definition of “monotone” across semantic types. First we need to define the set of “types that end with a t”.

Recursive definition of “types that end with a t”:
1. Type t “ends with a t”.
2. If x is any type at all, and y is a type that “ends with a t”, then <x,y> is a type that “ends with a t.”

(The result is in fact the set of all types that have t as their last ‘letter’ symbol, with any number (0 or more) of right brackets (>>> ...> ) following that last t. Every type ends with either an e or a t.)

Recursive definition of “≤”:
Now we can define ≤ on the set of all types that end in a t.

1. 0 ≤ 0, 0≤1, 1≤1. [In fact, we can divide ≤ into < and = in the natural way here.]
2. For any functional type <a,b>, and any f, g in D<e,b>, f ≤ g iff:
   For all x in D<e>, f(x) ≤ g(x).

That’s it. Let’s see how it applies to types t, <e,t> and <<e,t>,t>.
First, type $t$. This is the type of truth values, the extensions of sentences. Using $[a]$ to represent the semantic value of $a$, we can observe that for the case of sentences, $[a] \leq [b]$ is equivalent to "a implies b" (material implication, defined by the usual truth table), because it's true when a and b are both true ($\theta \geq 1$), when they are both false ($\theta \leq 0$), or when a is false and b is true ($\theta \leq 1$). The only case where it's false is where a is true and b is false (NOT: $\theta = 0$).

(Note: $\leq$ is not defined on type $e$, nor on any type that "ends with an $e$".)

Then type $<e,t>$, the type of characteristic functions of sets of entities, the semantic values of one-place predicate expressions (nouns, simple adjectives, maybe intransitive verbs, some prepositional phrases, etc.) Let $A$, $B$ be two expressions of type $<e,t>$, e.g. two common noun phrases. $[A] \leq [B]$ is true iff for all $d$ in $D$, $[A](d) \leq [B](d)$. But since $\leq$ on sentences means "implies", this is another way of saying that $A$ is a subset of $B$.

So we've derived the fact that less-than on predicates means "subset of" from the fact that less-than on propositions means "implies".

Now type $<<e,t>,t>$: Let me go straight to model-theoretic terms, bypassing the expressions. For all $P$, $P'$ in $D_{<e,t>,t}$, $P \leq P'$ iff for all $Q$ in $D_{<e,t>,t}$, $P(Q) \subseteq P'(Q)$. Since the possible denotations of type $<<e,t>,t>$ are sets of sets, this again turns out to the be subset relation, though this time it's the subset relation among sets of sets rather than among sets of entities.

Monotonicity:

Having defined $\leq$ across all the types that end with a $t$, we can define monotonicity for all functional types that end with a $t$ which have arguments that also end with a $t$:

For any type $<a,b>$ such that both $a$ and $<a,b>$ "end with a $t$", and any function $f$ of type $<a,b>$, $f$ is monotone increasing iff for all $x,y$ in $D_a$, $x \leq y$ then $f(x) \leq f(y)$.

Appendix 2: Pereltstraig’s suggested list of Russian idiomatic NPI’s.

Suggested list from Asya Pereltstraig (slightly shortened):

"Here’s a list of Russian idiomatic NPI’s. They are of different degree of idiomaticity, though. Even though some sources give affirmative variants as well, I cannot use any of these in affirmative (in the idiomatic sense, that is). Note that most expressions contain objects which are obligatorily in the Genitive of negation. I include negation to make it sound good..."

1. ne morgnut’ glazom - not to-blink eye:INSTR - not to be affected (usually by something bad)
2. ne davat’ proksoda komu-nibud’ - not to-give passage:GEN to smb. - to harass somebody
3. ne udarit’ palec (pal’cem) o palec - not to-strike finger:ACC (finger:INSTR) on finger:LOC - not to do anything to help
4. ni aza ne smyslit’/ponimat’/znat’ - NI az:GEN (first letter of the Old Russian alphabet) not to-understand/understand/know - not to understand/know anything
5. ne pokladaja ruk - not putting:GERUND hands:GEN - without resting (e.g., work hard)
6. dushi ne chajat’ v kom-to - soul:GEN not to-hope(?) - adore somebody
7. nog / zemli ne chujat’ pod soboj - legs:GEN / earth:GEN not to-feel underneath self –
8. uma ne prilozhu - mind:GEN not put-to-it:1:sg:FUT - I have no idea
9. ne spuskaja / svodja glaz - not letting-down:GERUND eyes:GEN - without taking eyes off somebody
10. ne znat’ usta - not-to-know tiredness:GEN - not getting tired
11. ne podavat’ / pokazyvat’ vida - not-to-give / show look:GEN - not to let know (about how one feels, etc.)

References.


