Lecture 12. Semantic Typology and Theories of NPIs and Negative Indefinites

May Schedule: ***No class May 13, no class May 20!***

May 6: Lecture 12. Semantic Typology and Theories of NPIs and Negative Indefinites. We will continue discussion of the topics in Lectures 8 -11, starting with an expanded version of the second half of the Lecture 11 handout, emphasizing the issues barely mentioned in this handout's Section 4, and extending the discussion to include open questions about the relation between the distribution of Accusative or Nominative vs. Genitive in Russian under negation ("Genitive of Negation), and possible connections between the Gen Neg construction and NPI phenomena.

Readings for May 6: (i) Haspelmath, Chapters 5 and 8, (ii) Adam Werle (2002) A typology of negative indefinites. *CLS 38 Parasession on Negation and Polarity*. (iii) Adam Werle (2001) (Both Werle papers are available on the course website.)

May 27: Last class. Topic: a joint presentation with Vladimir Borschev of the work on Genitive of Negation that we will present at the conference "Semantics and Linguistic Theory" (SALT 14) at Northwestern University, Evanston, Illinois, May 14-16.

All kursovye raboty due, all late assignments due. Bring zachetky or whatever papers are needed in order for me to give you a grade or a zachet or some certificate of participation if you want one. (MGU students: find or invent something I can sign.)

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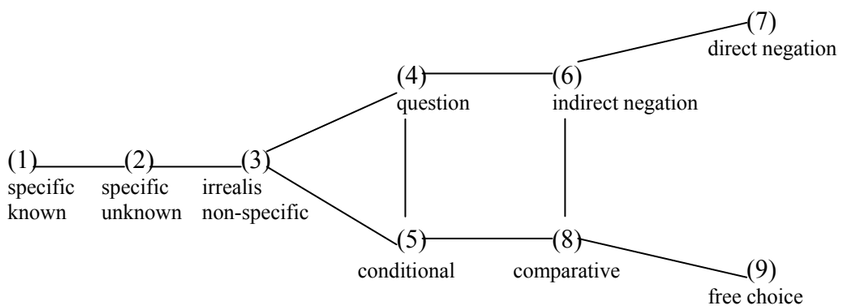
0. Introduction

Recall from Lectures 9 - 11 and your reading, Haspelmath's proposed semantic map of the different kinds of indefinites:

p. 4, Fig 1.1: *An implicational map for functions of indefiniteness pronoun series*



Preview of today's lecture:
In Lecture 11, we concentrated on "specific" indefinites and a bit on "non-specific" indefinites. There is much more to say about them (and see the extra handout with notes from Igor Yanovich in response to last week's handout.) We can come back to them in "seminar" if you wish, but in today's lecture the main focus will be on free choice indefinites, polarity sensitive indefinites, scalar implicatures, negation, and the Genitive of Negation. (There will be more about Genitive of Negation in the very last class on May 27.)

1. The nature of "free choice" indefinites and polarity sensitive indefinites.
a. The ∃/∀ debate about English *any*: one *any* (∃) or two (∃/∀)?
b. Scalar implicatures as a common feature of free choice indefinites. The connection to "quantifying superlatives" (Fauconnier 1975, Haspelmath 1997). Werle's analysis.
c. (Kratzer and Shimoyama 2002): "Free choice" is not a separate class of indefinites, but a pragmatic implicature that may arise in a variety of ways.
d. (Paducheva 1989) on "free choice" universals and 'potential' domains.

2. Regions that neighbor Haspelmath's semantic map.
Specific definites and their neighbors the definites; free-choice indefinites and their neighbors the universals; negative indefinites and their neighbors the negative quantifiers.

1. The nature of "free choice" indefinites and polarity sensitive indefinites.

1.1. The ∀/∃ debate about English any*: one* any *or two?*

There have been long debates in decades of literature about English *any*, including debate about whether all of its uses can be generalized into a single lexeme, and about whether in its seeming different uses it is existential or universal, or sometimes one and sometimes the other.

(1) Any cat hunts mice. – seems "universal". ('generic'.)

(2) Any doctor will recommend StopSneeze. – seems universal, but suggests "choose one".

(3) John didn't read any book. – could be wide scope universal or narrow scope existential, i.e. the whole sentence could be analyzed either as (i) or as (ii).

(i) $\forall x\,(book(x) \rightarrow \neg\ read(J, x))$

(ii) $\neg\ \exists x\,(book(x)\ \&\ read(J, x))$

What the analysis of NPI *any* should be depends in part on which way we look at those sentences.

The "negative quantifier" *no* is not considered ambiguous, but it also is subject to competing ∀/∃ analyses, since there are two logically equivalent ways in which it could be represented, as shown below. Since *no* is often analyzed as "Neg + *any*", debates about *any* and debates about *no* are related.

(4) Possible representations of *no* (from Werle 1991)

a. $[[no]] = \lambda Q\lambda P[\neg\exists x.Q(x)\&P(x)]$
semantic formula: $[[\text{ no } [_Q \text{ robot}] [_P \text{ came}]]] = \neg\exists x.[robot(x)\ \&\ came(x)]$
paraphrase: There is no *x* such that *x* is a robot and *x* came.

b. $[[no]] = \lambda Q\lambda P[\forall x.Q(x)\rightarrow\neg P(x)]$
semantic formula: $[[\text{ no } [_Q \text{ robot}] [_P \text{ came}]]] = \forall x.[robot(x) \rightarrow \neg came(x)]$
paraphrase: For all *x*, if *x* is a robot, then *x* didn't come.

Apparent differences between free choice and NPI *any*:

"Free choice" *any* can be modified by *almost,* NPI *any* cannot.

(5) Almost any doctor will recommend StopSneeze.

(6) *John didn't read almost any book.

Argument in favor of unifying: the superlatives show similar range of uses, as free choice items and as NPI's, paraphrasable by *any* in its 'two senses', and since superlatives are an open class, they should have a uniform treatment. And if they do, then presumably *any* can have a uniform treatment too.

Haspelmath's typological caveat: Don't try TOO hard to unify them, because many languages (e.g. Russian) use different expressions for those two functions.

1.2. Scalar implicatures, quantifying superlatives, and free choice indefinites.

Here we will discuss the ideas of Fauconnier 1975 (and later), their connection to our study of negative polarity and downward monotonic functions as formalized by (Ladusaw 1979, Ladusaw 1996), and the very good discussion in Chapter 5 of Haspelmath's book. Here I will repeat some definitions and comments from (Werle 2001); see also (Werle to appear); both are on the course website.

First of all, the similarity in the two kinds of *any* can be seen when they are represented as universal quantifiers, showing an implicit "if-clause" (the "restrictor" of the quantification); the following is from Werle (1991).

(7) The negative polarity reading -- ∃ and ∀ representations.

a. Oscar does**N'T** like **anyone**. (under verbal negation)

b. logical formula: $\neg\exists x.[person(x) \,\&\, Oscar\text{-}likes(x)]$ (existential quantification)
paraphrase: There is no *x* such that *x* is a person and Oscar likes *x*.

c. logical formula: $\forall x.[person(x) \rightarrow \neg Oscar\text{-}likes(x)]$ (universal quantification)
paraphrase: For all *x*, if *x* is a person, then Oscar doesn't like *x*.

However, polarity items often have available an additional reading, traditionally called the free choice reading. The free choice reading is schematized with the logical formula $\forall x.[Q(x) \rightarrow P(x)]$.

(8) The free choice reading

a. **Any** owl hunts mice.
logical formula: $\forall x.[owl(x) \rightarrow hunts\text{-}mice(x)]$
paraphrase: For every *x*, if *x* is a kind of owl, then *x* hunts mice.

b. Polk would use **any** trick.

logical formula: $\forall x.[trick(x) \rightarrow Polk\text{-}would\text{-}use(x)]$
paraphrase: For every *x*, if *x* is a trick, then Polk would use *x*.

Although the ∃ analysis is more widely adopted for the NPI reading, the scalar implicature approach suggests that it is easier to unify NPIs and free choice readings by focusing on their ∀ readings. But this does not mean that we have to assume that *any* itself "means" ∀. Here is where the notion of scalar implicature is important, and the examples with the minimizing superlatives provide strong arguments.

Quoting Werle 1991: (See Werle's paper or Haspelmath's book for references mentioned.)
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Fauconnier's 1975a proposal that *any* gets its universal force by entailment along a pragmatic scale is supported by independent evidence that scales are necessary to derive universally entailing readings for superlatives and other expressions interpretable as scalar endpoints (Horn 1972). Such expressions include morphological and logical superlatives like *the strongest man*, *the weakest cow*, *his own brother*, and *even a kid*. I briefly review here evidence that entailing superlatives evince the same behavior as polarity items, supporting the scalar indefinite analysis.

Each of the superlatives in sentences (a) through (c) below can get a universally entailing reading because the superlative and the property represented by the rest of the sentence allow the construction of a pragmatic scale whose members are ordered according that property, and of which the superlative is one endpoint, such that predicating the property of that endpoint entails that the property holds of the rest of the scale. In the case of *Iocaine kills the strongest man*, the scale is an ordering of men with the one least likely to be killed by poison — the strongest man — at the bottom. Under the entailing reading, the sentence is understood as meaning that iocaine kills everyone, because if it kills the strongest man, it must kill everyone else on the scale too. The polarity item *anyone*, which also denotes a scalar endpoint, gets a similarly entailing reading in the same context.

(9) Entailing superlatives and *even*

a. Iocaine kills **the strongest man** / **anyone**. ⊃ $\forall x.[man(x) \rightarrow iocaine\text{-}kills(x)]$
b. **The weakest cow** / **any cow** could swim this river. ⊃ $\forall x.[cow(x) \rightarrow could\text{-}swim\text{-}this\text{-}river(x)]$
c. Iago would betray **his own brother** / **anyone**. ⊃ $\forall x.[person(x) \rightarrow Iago\text{-}would\text{-}betray(x)]$
d. **Even a kid** / **anyone** can be courteous. ⊃ $\forall x.[person(x) \rightarrow can\text{-}be\text{-}courteous(x)]$

Other scalar analyses of PSIs include Krifka 1990, 1994, 1995, Lahiri 1995, and Lee 1997, all of which analyze polarity sensitive items as introducing alternatives into the discourse. Krifka 1995, Ladusaw 1996, and Israel 1996 provide comprehensive summaries and comparisons of different approaches to polarity sensitive items.

… (continuing with more Werle:)

The general idea of the scalar indefinite analysis, introduced in the last section, is that a polarity item denotes an endpoint of a pragmatic scale, and induces universal quantification by means of entailment along that scale. Adapting the formal analysis of the scalar adverb *even* proposed in Lee & Horn 1994, I posit a denotation of *any* with three parts: a presupposition, an assertion, and an entailment. The presupposition is that there exists some pragmatic scale with an entailing endpoint *m*. The assertion is just that the relevant property holds of *m*. The entailment is that the property therefore holds of every other member of the scale.

This denotation is represented as a semantic formula and a paraphrase. In the following example, the denotation of *any* consists of a lambda expression followed by a presupposition and an assertion (both in brackets). The pragmatic entailment of *any*, however, is not part of its semantic denotation, but follows from it.

(10) Denotation of *any*

a. [[any]] = λQλP: [[∃!S. S is a pragmatic scale, S on Q] & [∃!m∈S.∀x∈S.P(m)⊃P(x)]]. [P(m)].

b. paraphrase: the denotation of a natural language expression [P [*any* [$_{NP}$ Q]]], where P is a property and the noun phrase [$_{NP}$ Q] is the focus of *any*, is [[any]](Q)(P), which includes the following presupposition (i) and assertion (ii). In addition, the presupposition and assertion produce the pragmatic entailment in (iii).

(i) presupposition: there is (one and only one) pragmatic scale S on the members of Q, and there is (one and only one) element *m* in S such that for all *x* in S, if the property P holds of *m*, then P holds of *x*;

(ii) assertion: the property P holds of the entity *m*;

(iii) entailment: for all *x* in S, the property P holds of *x*.

Both the presupposition and entailment of *any* depend on the following formal definition of a pragmatic scale.

(11) Definition of pragmatic scale

a. pragmatic scale: a set S ordered according to some property P such that (i) ∀x,y∈S, if x>y then P(x) is more likely than P(y), and (ii) S has a top a∈S and/or a bottom z∈S, such that ∀x∈S.a≥x≥z.

b. paraphrase: a pragmatic scale is a set whose elements — whether entities, kinds, or quantities — are ordered according to the likelihood that some property applies to them. The top and bottom ends of the scale are differentiated such that the top is the element for which the relevant property is most likely to hold, while the bottom is the element for which the property is least likely to hold.

…

(12) a. We don't hear **any** noise. (nonexistence interpretation)

S = the scale of quantities of noises ordered according to how likely we are to hear them
m = top / the most likely quantity of noise for us to hear
then [We don't hear *m*] entails [For all *x*, if *x* is a quantity of noise, then we don't hear *x*]

b. **Any** owl hunts mice. (free choice interpretation)

S = the scale of kinds of owls ordered according to how likely they are to hunt mice
m = bottom / the least likely owl to hunt mice
then [*m* hunts mice] entails [For all *x*, if *x* is an owl, then *x* hunts mice]

To see that only one end of a scale is entailing, compare the results in the next example of trying to yield a nonexistence interpretation with the bottom end of a scale (a), or a free choice interpretation with the top (b).

(13) a. *m* = bottom / the least likely quantity of noise for us to hear
then [We don't hear *m*] does *not* entail [For all *x*, if *x* is a quantity of noise, then we don't hear *x*]

b. *m* = top / the most likely owl to hunt mice
then [*m* hunts mice] does *not* entail [For all *x*, if *x* is an owl, then *x* hunts mice]

Formal Semantics, Lecture 12
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As shown by these examples, the relevant pragmatic scale for a given context is sometimes a scale of quantities (a), sometimes a scale of kinds (b), and sometimes a scale of entities (e.g. *We didn't see anyone*). Lee & Horn 1994 propose that nonexistence interpretations always involve quantity scales, while free choice interpretations involve kind scales, but I suggest that it is sufficient to assume that the pragmatics will determine the appropriate scale.

…

In general terms then, we can say that a context that licenses e.g. *anything*, under either its negative polarity or free choice reading, is also the property P with which *anything* semantically composes in each case. A couple of generalizations follow from this about what contexts are polarity item licensing. First, felicitous licensors for polarity items are those that can yield an appropriately entailing scale. Second, polarity items actually have scope over their licensors, since their licensors are their arguments

These generalizations are illustrated by the following example. The sentence *I doubt that John understands anything* has available both a negative polarity reading (b) and a free choice reading (c), but these readings have slightly different scopal properties because their licensor/sisters are different constituents. The denotation for each reading shows which constituent represents the predicate P with which the polarity item *anything* must compose.

(14) a. I doubt that John understands **anything**.

b. Negative polarity reading

paraphrase: I doubt that there is anything that John understands (i.e. he understands nothing).
truth conditions: [∀x.[$_P$ I doubt that John understands *x*].
denotation: [[anything]][$_P$ λx.*I-doubt-that-John-understands*(x)]
m = top / the most likely thing for me to doubt that John understands: P(m) ⊃ ∀x.P(x)

c. Free choice reading

paraphrase: I doubt that it's that case that John understands everything (i.e. he understands some things).
truth conditions: I doubt that [∀x.[$_P$ John understands *x*].
denotation: [λp∈D⟨t⟩.*I-doubt-that*(p)] ([[anything]][$_P$ λx.*John-understands*(x)])
m = bottom / the least likely thing for John to understand: P(m) ⊃ ∀x.P(x)

My claim that *m* must denote the bottom of a scale under the above free choice reading may seem odd because of the difficulty of perceiving the free choice reading. But *m* must be the bottom in the free choice interpretation, because the felicitousness of the context as a free-choice-licensing context is evaluated before *I doubt that* composes with the rest of the semantic calculation. For the embedded proposition *John understands anything* to yield a universal entailment, *anything* must denote the least likely thing for John to understand. If John understands this thing, then he must understand anything. Only then do we compose this proposition with *I doubt that*, discovering that in fact, I doubt the proposition that John understands everything.

The generalizations made above over the scope and licensing of polarity items are stated more explicitly here as the *polarity item scope and licensing generalization*.

(15) Polarity item scope and licensing generalization: a polarity item gets scope immediately over its licensor, which is an expression meeting the following criteria:

(i) it is a constituent with which the item can semantically compose, (ii) it is a sister to the item at LF, (iii) it enables the construction of a felicitously entailing pragmatic scale.

…
(To explain languages with different lexical items for free choice and NPI indefinites:) Building on proposals by Fauconnier 1975a, Lee & Horn 1994, Israel 1996, and Haspelmath 1997, I will propose a minor extension of the analysis, claiming that negative polarity items and free choice items have an additional semantic specification in their denotations that they denote the tops and bottoms of pragmatic scales, respectively. This extended analysis will be shown to explain both the complementary distribution and different interpretations of these items.
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1.3. Theoretical approaches to free choice indefinites.

The Kratzer and Shimoyama approach to free choice via pragmatic implicatures that can arise in a variety of ways. Their approach offers some hope of unifying a number of competing approaches that can be found in the literature. Free choice and "alternatives" (see also Paducheva 1989). Free choice and "domain widening" (Kadmon and Landman 1993). Free choice and modality (Dayal 1995, Dayal 1998).

Part of the main idea of Kratzer and Shimoyama's approach: free choice indefinites introduce sets of alternatives into the interpretation ("Hamblin sets"), which compositionally work their way up the tree to produce alternative sets for the larger expressions that contain them, and they continue to work there way up until they encounter an operator which is defined to operate on alternative sets and do something with them.

Such operators include:

- question operator (which was Hamblin's original motivation for introducing "alternative sets" into the semantics): speaker asks hearer to identify which of the alternatives is true. (For embedded questions, different question-embedding predicates have meanings that operate in various ways on sets of alternatives – *know, ask, wonder, decide, depend on*)
- various modal operators: these may quantify over alternatives in various ways. See the Kratzer and Shimoyama paper. Some are more like existential quantifiers over possible worlds (possibility modals), some more like universal quantifiers (necessity modals).
- imperative. Note that 'commands' are similar to necessity modals and 'offers' or 'permissions' are similar to possibility modals, so imperatives are likely to have (at least) two semantico-pragmatic different kinds of behavior.
- negation.

The "widening" effect. Kadmon and Landman (Kadmon and Landman 1993) noted that free-choice *any* normally has the effect of widening the domain of quantification beyond what it would be with a simple indefinite. They suggest that *any* lexically carries a double requirement: that it widen its domain, and that the result be a strengthened proposition. In other words, if there is no 'work' for *any* to do by widening its domain, *any* will not be permitted: this is how they get the constraint against the occurrence of *any* in contexts with no licensing elements.

Kratzer and Shimoyama, who treat the free choice items introducing alternatives, agree with K&L that the 'widening' effect should always have a motivation, but it isn't always strengthening: it could be weakening, or it could be avoiding falsehood, for instance. They agree with Horn and Kato, Krifka, Werle, and others, that the meaning of *any* has an *even* part and an indefinite part; and the meaning contribution of the *even* part essentially relies on alternatives. They note that a question like that below, from a teacher to a student, could be either friendly (widening to encourage a yes answer) or unfriendly (widening to increase the strength of the implied accusation):

(16) Have you read anything at all?

2. The neighbors at the extremes of the semantic map

In order to put Haspelmath's semantic map in a wider context, it would be good to see what the "neighbors" are at various points.

2.1. Specific indefinites vs. definites

'Semi-definites' like a certain use of *this guy*: definite or indefinite? Criteria? Intermediate points on that scale as well. Try to integrate Padučeva's work on referential status.

2.2. Free-choice indefinites vs. universal quantifiers

This is one of the neighborhoods that Tatevosov expands.

2.3. Negative indefinites vs. negative quantifiers

And more generally, indefinites vs. quantifiers at various points on the map.

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