

Indefinite determiners and referential anchoring¹

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1. Aims of this talk:

- ⇒ three theoretical points:
 - Clear distinction between functional and scopal readings
 - Functional readings can be pragmatic or semantically coded
 - Referential anchoring is a domain narrowing mechanism.
- ⇒ an empirical point:
 - We illustrate how referential anchoring can deal with three Russian indefinites, that are apparently unrelated, since one of them is *epistemically specific*, one of them is *scopally specific* and one of them is *non-specific* (in the sense of Farkas 2002). We analyze all of them with exactly the same formal means.

2. Functional readings and scopal readings

⇒ Some indefinites may have both functional and plain scopal readings.

- (1) Each husband had forgotten **some** date.
- a. ... his wife's birthday. FUNCTIONAL NARROW READING
 - b. ... John had forgotten Mary's birthday, Michael his wedding anniversary etc. PLAIN NARROW SCOPE READING.

⇒ Some indefinites only allow for functional readings.

- (2) Each husband had forgotten a **certain** date
- a. ... his wife's birthday. FUNCTIONAL NARROW READING.
 - b. ?? ... John had forgotten Mary's birthday, Michael his wedding anniversary etc. PLAIN NARROW SCOPE READING.

⇒ A functional reading is a distinct reading of indefinites. Depending on the logical environment functional readings either entails or entails the corresponding plain scopal reading.

- (3) a. Each husband had forgotten a certain date
ON THE FUNCTIONAL NARROW READING ENTAILS THE NARROW SCOPE READING OF:
Each husband had forgotten some date
- b. Not every husband had forgotten some date
ON THE NARROW SCOPE READING ENTAILS THE FUNCTIONAL NARROW READING OF:
Not every husband had forgotten a certain date

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⇒ Why aren't these readings clearly kept apart in the literature?

- because the distinction is not obvious in the case of wide readings.
- because – historically – people started showing that intermediate readings for indefinites over scope island exist by giving functional reading examples.
- because in the Skolemized form they really look alike.
However, the fact that functional readings always scope over negation and plain scopal readings may not, needs an explanation.

⇒ Why would it be useful to keep these readings clearly apart?

- Because it turns out to be quite difficult to come up with one single fully predictive formalism, that models functional and plain scopal readings at the same time both in upwards and downwards entailing contexts. Cf. Schwarz (2001).

(4) John read every book that every football player signed.

- a. Existing reading: John read every book that was signed by all football players.
- b. Non-existing reading: For every football player, John read every book he signed.

(5) Every girl read every book that some football player signed.

- a. Existing reading: Every girl read every book that was signed by any football player.
- b. Existing reading: There is a football player such that every girl read every book signed by him.

- Apparently, also *at least one, exactly one* etc. may also get exceptional wide scope. (Ionin 2010). This strongly suggests that exceptional wide scope is really true scope shifting, as suggested by Schwarz (2001).

⇒ We will only discuss functional readings in this paper.

- For explicitness we assume that plain scopal readings can be modeled as existential quantifiers, and we assume with Endriss (2009) that exceptional plain scope readings are topic-driven. Not much of the following hinges, however, on the precise mechanism, by which one derives exceptional plain scopal readings.
- We claim that the correct mechanism to model functional readings is referential anchoring (term from: von Heusinger 2002)

3. Referential anchoring and domain narrowing

⇒ Our proposal to model referential anchoring is widely equivalent with Kratzer's (1998) Skolemized Choice Functions. (For recent plain Skolem notations without choice functions see e.g. Steedman (2007), Dekker (2008), Endriss (2009))

⇒ Crucially, however, our analysis is a domain narrowing analysis in the sense of Schwarzschild (2002) and resemblance to Skolem- and Choice functional approaches is – in a sense – incidental.

- (6) a. $\llbracket \text{a certain date} \rrbracket = f(y)(\lambda x. \text{date}(x))$ Kratzer (1998) style
 b. $\llbracket \text{a certain date} \rrbracket = \lambda Q. \text{true iff } (\exists x) (\text{date}(x) \ \& \ x = f(y) \ \& \ Q(x))$ referential anchoring

⇒ There are some reasons why we propose such a slightly different notation:

- First, the use of choice functions doesn't seem to pay off. Since referential anchoring neutralizes scope, functional readings “out of scope islands” do not actually involve any island violation. The original motivation of Choice Functions, however, was to model island escape. We know from Schwarz (2001, 2004) that they fail on plain scopal readings. We know that for functional readings they are not needed. So they don't seem to have a clear empirical motivation.
- How can *her father in law* in (7) can identify a Skolemized Choice Function.
- We have better predictions with regard to presuppositions than Kratzer.
 - If functional readings are identified overtly, the identifying function must be a function that takes values belonging to the overt restrictor of the indefinite. E.g. in (7) *father in law* entails that the function will have men as a value. (10), in which this doesn't hold true, is indeed, very weird.
 - We can account for this, by adding a presupposition that the function takes the correct values, as in (9).
 - In Kratzer (1998) presuppositionality is accounted for by definedness conditions of choice functions, hence (10) is not ruled out.

(7) Not every woman ate all the cookies some man has brought, namely her father in law

(8) ?Not every woman ate all the cookies some man has brought, namely her favorite parent.

(9) $\llbracket \text{a certain man} \rrbracket = \lambda Q. \text{true iff } (\exists x) (M(x) \ \& \ x = f(y) \ \& \ Q(x)) \ \& \ \partial(\forall x) x \in D_c \rightarrow M(f(x))$

⇒ While Kratzer (1998) assumes ambiguity between a choice function and an existential quantifier for e.g. English *some*, we allow the introduction of the functional dependency to be pragmatic.

- This can happen through an pragmatic operator:.

(10) $\llbracket \text{OP} \rrbracket = \lambda\Phi \lambda P \lambda Q. \Phi (\lambda x. P(x) \ \& \ x = f(y)) (Q)$

- Note that this operator doesn't apply to other quantifiers for pragmatic reasons. e.g. why reduce the domain of quantification for a singleton, when using a universal quantifier?

⇒ We also differ from Skolem function approaches in that we assume that functional readings are in nature instances of domain narrowing (cf. Schwarzschild 2001).

- Our formalism makes this transparent and formally explicit.
- Domain narrowing is independently motivated.

(11) Each author_i in this room despises every publisher who would not publish a book he_i had written that was deemed pornographic.

$f = \lambda z. \lambda y. z \text{ had written } y \text{ and } y \text{ was deemed pornographic.}$

General claims:

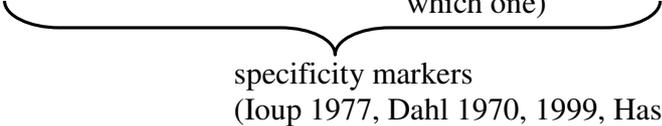
⇒ Indefinites may be plain existential quantifiers. If so they can receive functional readings via pragmatic enrichment.

- ⇒ Indefinites may also lexically code that they are anchored and also constraints on referential anchoring. This allows modeling much variation in the meaning of indefinite determiners.
- ⇒ Since referential anchoring neutralizes scope functional indefinites are completely irrelevant for the exceptional scope discussion.

4. Referential anchoring and Russian determiners

Russian: - no indefinite article, but

-indefinite pronouns/determiners: *koe-*, *-to* and *-nibud'*.

- | | | | |
|------|--|---|---|
| (12) | a. koe-kakaja studentka
KOE-which student
'a certain student
(speaker knows which one)' | b. kakaja-to studentka
which-TO student
'a certain student
(speaker doesn't know
which one)' | c. kakaja-nibud' studentka
which-NIBUD' student
'some student or another' |
| |  <p>specificity markers
(Ioup 1977, Dahl 1970, 1999, Haspelmath 1997)</p> | |  <p>non-specificity marker</p> |

In this paper: all three determiners encode functional dependencies

4.1 Indefinite pronouns with *koe-* and *-to*

- *-to* and *koe-* indefinites take wide scope
 - main difference: identifiability (Haspelmath 1997, Paducheva 1985)
- (13) Kazhdyj student voschischchaetsja **koe-kakim** professorom.
Every student Admires KOE-which professor
'Every student admires a certain professor, the speaker can identify.'
- (14) Kazhdyj student voschischchaetsja **kakim-to** professorom.
Every student Admires which-TO professor
'Every student admires a certain professor, the speaker cannot identify.'

- The core meaning of *-koe* vs. *-to*

Koe-: Inference: the speaker can identify the referent. This inference cannot be cancelled.

- (15) Zvonil **koe-kakoj** student. # No ja ne znaju, kto eto byl.
called KOE-which student. But I don't know who it was.
'A certain student called. But I don't know who it was.'

- a contrast between *-to* and *koe-* is possible:

- (16) A: **Kto-to** ukral knigu iz biblioteki.
 who-TO has stolen a book from the library
 ‘Somebody has stolen a book from the library.’
 B: Interesno, a **koe-kto** tozhe!
 actually, but KOE-who too.
 ‘Actually, somebody too.’
 Intended meaning: The person *x* has also stolen a book from the library, but the speaker doesn’t want to tell who it was

The inference of *koe-* “the speaker can identify the referent” = the referential anchor is invariably the speaker and the function is *intend to refer to x at t*. For it we assume this inference to belong to a conventional part of the meaning of *koe-*

-to: the inference “the referent is not identifiable by the speaker”

Kagan (2007): this inference is inherently encoded as a conventional implicature (Potts 2007) in the lexical entry of *-to*.

Geist & Onea (2007) suggest that this inference can be derived as a conversational implicature.

- this conversational implicature can be cancelled

- (17) Igor vstretil **kakuju-to** zhenshchinu, ^{ok} a imenno Ninu. (50% of informants ok)
 Igor met which-TO woman namely Nina.
 ‘Igor met a certain woman, namely Nina.’
- (18) Igor vstretil **koe-kakuju** zhenshchinu, # a imenno Ninu. (25% of informants ok)
 Igor met KOE-which woman namely Nina.
 ‘Igor met a certain woman, namely Nina.’

- this conversational implicature can be reinforced

- (19) Igor vstretil **kakuju-to** zhenshchinu ^{ok} Ja dejstvitel’no ne znaju kto eto byl.
 Igor met which-TO woman I really don’t know who it was.
 ‘Igor met some woman. I really don’t know who it was.’

- An additional meaning component of *koe-*:

“The speaker doesn’t intend to disclose the referent of the indefinite in discourse” (Kagan 2007). This component distinguishes *koe-* from indefinite *this* in English (Ionin 2010) and *pe* in Romanian von Heusinger & Chiriacescu (2010), which signal that the speaker intends to say more about its referent.

- (20) $\llbracket \text{koe} \rrbracket = \lambda P \lambda Q$. true iff $(\exists x) (P(x) \ \& \ x = \mathbf{ty} \ \text{speaker intends to refer to } y \ \text{at } t \ \& \ Q(x))$
 CI: The speaker doesn’t want to disclose the identity of *x*.
- (21) $\llbracket \text{to} \rrbracket = \lambda P \lambda Q$. true iff $(\exists x) (P(x) \ \& \ x = \mathbf{f}(y) \ \& \ Q(x))$ (preliminary entry)
 where *f* and *y* are contextually determined

- Possible anchors for *-to*: - the subject of the matrix clause (22),
- piece of evidence (22), (23).

- (22) Igor videl, chto **kakoj-to** student shpargalil na ekzamene.
Igor saw, that which-TO student cheated on exam
'Igor saw that some student cheated on the exam. (The speaker cannot tell which one but Igor can.)'
- (23) **Kakoj-to** student shpargalil na ekzamene.
which-TO student cheated on exam
'Some student cheated on the exam.' (The speaker cannot tell which student.)

- The scope of *-to* indefinites

Predictions: while *koe-* indefinites must have constantly functional widest readings, *to*-items should be more flexible.

- (24) a. Kazhdyj student voschischchaetsja **koe-kakim** professorom.
Every student admires KOE-which professor
'Every student admires a certain professor.'
- b. $(\forall x)$ (student(x) \rightarrow $(\exists y)$ (professor(y) & $x = y$. *speaker intends to refer to y at t* & admires(x, y))
- (25) a. Kazhdyj student voschischchaetsja **kakim-to** professorom.
Every student admires which-TO professor
'Every student admires a certain professor.'
- b. $(\forall x)$ (student(x) \rightarrow $(\exists y)$ (professor(y) & $y = f(c)$ & admires(x, y))
where c is a contextually bound variable
- c. $(\forall x)$ (student(x) \rightarrow $(\exists y)$ (professor(y) & $y = f(x)$ & admires(x, y))

Crucially: *-to* cannot get a 'narrow scope' reading under an opaque operator, i.e., the anchor cannot be of type w or s .

- (26) Igor' hochet zhenit'sja na **kakoj-to** studentke.
Igor wants marry at wh-TO student
'Igor wants to marry a certain student.'

4.2 Russian indefinite pronouns *-to* vs. *-nibud'*

- Indefinites with *-nibud'* have always narrowest possible scope.

- (27) a. Kazhdyj student objazatel'no voschischchaetsja **kakim-nibud'** professorom.
Every student necessary admires which-NIBUD' professor
'As a rule, every student admires a professor.'
- b. * 'the same professor for all students' \rightarrow wide scope
- c. ^{OK} 'different professors' \rightarrow narrow scope

What is the difference between *-nibud'* and *-to*, apart from the fact that *-to* can also take wider readings?

- Corpus data

(28) Ochevidno kazhdoe chislo oboznachaet **kakuju-to** bukvu. [RNC1]
probably every number indicates which-TO letter.
'Probably every number stands for a certain letter.'

Intuition: the speaker calls the hearer's attention to the existence of some code which systematically assigns numbers to particular letters.

(29) Dlja kazhdogo teatra u babushki byl **kakoj-nibud'**
For every theater at grandmother was which-NIBUD'
objazatelnyj fetish: dlja Bol'shogo - broshka dlja malogo- busiki... [RNC2]
obligatory fetish for Bolshoj a brooch for Malyj a necklace
'For each theatre the grandmother had a very special obligatory piece of jewelry:
for Bolshoj theatre a brooch, for Malyj theatre a necklace...'

Intuition: pieces of jewelry are arbitrarily assigned to theatres. Of course, even in this case, there is a function which assigns jewelry to theatres, but such a function must be unsystematic at least as far as the speaker is concerned.

Conclusion: not any function will do to satisfy the meaning of (29): the systematic ones are ruled out. This is a clear sign for us, that *-nibud* does place constraints on possible functions, and, hence, signals some kind of referential anchoring.

(30) *Hypothesis:*
In contexts with quantifiers
-to indicates a systematic functional dependency, if its anchor is bound by a quantifier;
-nibud' indicates that the function is non-systematic.

(31) *Predictions:*
A. In contexts providing a systematic dependency *-to* indefinites are preferred.
B. In contexts providing no systematic dependency *-nibud'* is preferred.

Web-experiment

- a context-based forced choice task
- 8 stories: 4 stories providing a systematic dependency and 4 stories with an unsystematic dependency
- between subject design

(32) The story provides a systematic function
John's grandmother likes to go to the theatre. She is a very systematic woman, she used to work as an accountant in a factory. She now carefully developed a system, which cloths and jewelry to wear for each theater. For every theater, she wears the piece of jewelry which best matches the color of the seats.

- a) Johns grandmother wears for every theater KAKOJ-TO piece of jewelry.
 - b) Johns grandmother wears for every theater KAKOJ-NIBUD' piece of jewelry
 - c) Both a) and b) are inappropriate in this situation.
- (33) The story provides a non-systematic function
 John's grandmother is a very weird woman. For some totally unintelligible reason she wears some special clothes and jewelry for each theater she visits. When she goes to the Bolshoi theater she wears her red brooch, when she goes to the Pushkin theater, she wears a huge golden ring and so on. She is very funny but also crazy.
- a) Johns grandmother wears for every theater KAKOJ-TO piece of jewelry.
 - b) Johns grandmother wears for every theater KAKOJ-NIBUD' piece of jewelry
 - c) Both a) and b) are inappropriate in this situation.

86 native speakers have participated in the study. The main results are represented in **Table 1**.

indefinite	+ systematic	- systematic	Total
-to	48% (22)	26% (11)	33
-nibud'	31% (14)	53% (22)	36
neither nor	20% (9)	19 (8)	17
Total	100% (45)	100% (41)	86

Table 1 Results of the experiment

The results are consistent with our predictions.

Statistical relevance of our results: $\chi^2=5,324074$, $df=1$, $p<0.025$. Thus, our hypothesis is confirmed.

- Systematicity of the function involved in -to:
 - for narrow or intermediate functional readings: the anchor is a quantifier, the function must be systematic,
 - for wide functional reading: the anchor is a constant (is fixed), the function is trivially systematic.

- (34) $\llbracket to \rrbracket = \lambda P \lambda Q. \text{true iff } (\exists x) (P(x) \ \& \ x = f(y) \ \& \ Q(x))$
 it is presupposed that f is a systematic contextually determined function

Prediction of (34): -to will not enter functional dependencies with world or situation variables quantified in opaque contexts. This is because functions from worlds to individuals are non-systematic.

More on -nibud'

- In simple declarative sentences like (35) -nibud' is excluded. An insertion of a modal operator in (36) improves the sentence, cf. (36).
- (35) *Petja pogovoril s kakim-nibud' juristom.
 Petja spoke with which-NIBUD' lawyer
 'Petja spoke with some lawyer.'

- (36) Petja hochet pogovorit' **s kakim-nibud'** juristom.
 Petja wants to-speak with which-NIBUD' lawyer
 'Petja wants to speak with some lawyer.'

Other licensors of *-nibud'*: quantificational DPs referring to sets of individuals (Yanovich 2005, Pereltsvaig 2008)

- (37) Kazhdyj mal'chik nes **kakuju-nibud'** tjazhest'
 Every boy carried which-NIBUD' load
 'Every boy carried some load.'

Thus, *-nibud'* seems unrestricted with regard to the possible anchor variables: individuals as in (37) and possible worlds as in the modal context (36) can serve as appropriate anchors. We capture all of these possible anchor types under the label of *situations* in the sense of Kratzer (1989).

Motivation: -nibud' is allowed not in all contexts with quantificational DPs such as *every boy*. We assume, however, that the appropriate restrictions can be formulated in situation semantics. ,

- (38) *Kazhdyj mal'chik vchera poceloval *kakuju-nibud'* odnoklassnicu.
 Every boy yesterday kissed which-NIBUD' classmate
 'Yesterday, every boy kissed some classmate.'

- (39) $\llbracket \text{nibud}' \rrbracket = \lambda P \lambda Q. \text{true iff } (\exists x) (P(x) \ \& \ x = f(s) \ \& \ Q(x))$
 it is presupposed that $\neg s \leq_p w_0$

To sum up, we have shown that the distributional properties of *-to*, *-koe* and *-nibud'* can be captured by the assumption that these items lexicalize constraints on referential anchoring. In particular: *koe-* is the most specified item. It requires the anchor to be the speaker and the function to be interpreted as '*to intend to refer to y at t*'; *-to* lexicalizes the constraint that the referential anchoring function must be systematic; *-nibud'* lexicalizes the constraint that the anchor must be a situation that has some not further specified modal flavor, the specification of which we leave for further research.

Sources

[RNC] Russian National Corpus:
 [RNC 1]: Tim Sobakin. Shifry. 1990
 [RNC2]: Inka 2004

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