Two *many* modifiers

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Workshop on modification (with and without modifiers)

Centro de Ciencias Humanas y Sociales, Madrid, Dec 15-16, 2011

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Introduction

'Many' and 'few' are known to have proportional ("strong") and cardinal ("weak") readings, Partee (1989). The following examples are from Gawron (undated).

(1) Proportional: proportionately there were few
  a. Many fleas were tested. Few fleas survived.
  b. 89 out of 1000 tested fleas survived: true
  c. 89 out of 100 tested fleas survived: false

(2) Cardinal: some number counts as few in context
  a. The house seemed clean -- Lee found few fleas.
  b. 89: false
  c. 8: true

In Russian, 'many' and 'few' each have two distinct translations with different semantics.

mnogie ('many') and *nemnogie* ('few') always have proportional readings:

(3) Proportional context
  a. V eksperimente islolzovali mnogo blox. Nemnogie bloxi uceleli.
  in experiment they_used mnogo fleas. neg_mnogie fleas survived
  'Many fleas were tested. Few fleas survived.'
  b. V eksperimente ispolsovali 100 blox. Mnogie bloxi uceleli.
  in experiment they_used 100 fleas. mnogie bloxi survived
  '100 fleas were tested. Many fleas survived.'

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mnogo ('many') and *malo* ('few') are used to render cardinal readings:

(4) Cardinal context
  a. Dom kazalsja chistym i Lee nashol malo blox.
  house seemed clean and Lee found malo fleas
  'The house seemed clean and Lee found few fleas.'
  b. Dom kazalsja svinarnikom i Lee nashol mnogo blox.
  house seemed pigsty and Lee found mnogo fleas
  'The house looked like a pigsty and Lee found many flees.'

English 'many' and 'few' can head both indefinite ('weak') and quantificational ('strong') DPs (Milsark 1974):

Only indefinite DPs can occur in existential *there*-sentences:

(5) There were ok sm/ok three/ok many/*most/*all cyclists along the creek.

Only quantificational DPs can occur as subjects of individual-level predicates:

(6) *Sm/*three/ok many/ok most/ok all people are democrats.

The same tests applied to Russian show that (proportional) *mnogie* heads strong DPs and (cardinal) *mnogo* heads weak DPs (Babko-Malaya 1998):

(7) a. Mnogie ljudi – demokraty.
  mnogie people democrats
  b. *Mnogo ljudej – demokraty.
  mnogo people democrats

(8) a. Vdol' ruch'ja bylo mnogo velosepedistov.
  along creek was mnogo cyclists
  b. *Vdol' ruch'ja byli mnogie velosepedisty.
  along creek were mnogie cyclists

Weak determiners pattern syntactically like adjectives (*the three chairs / the black chairs; every three chairs / every black chair*). It is commonly assumed that they have the same type as intersective adjectives, namely <et> (e.g. Verkuyl 1981, Krifka 1999).

So we would expect that weak/indefinite *mnogo* is adjective-like, while strong/quantificational *mnogie* is more like unambiguously quantificational determiners. This is what Partee (1989) assumes for English *many*.

Surprisingly, we find a very different pattern!

It is the strong form *mnogie* that patterns with adjectives:

(9) a. mnogie/nemnogie studenty
many/few student.pl.Nom
'many/few students'
b. vysokie studenty
tall student.pl.Nom
'tall students'

And the weak form patterns with something else altogether -- measure phrases:

(10) a. mnogo/malo studentov
many/few student.pl.Gen
'many/few students'
b. dve tonny bobov
two tons bean.pl.Gen
'two tons of beans'

Form	Semantics	Milsark test	Expected syntax	Actual syntax
mnogie	proportional	strong (quantificational)	determiner-like	adjective-like
mnogo	cardinal	weak (indefinite)	adjective-like	MeasureP-like

In this talk we consider the question: Why is the adjectival *mnogie* not weak and the MP-like *mnogo* not strong?

1. New Data: Focus sensitivity of 'mnogie' and 'mnogo'

It has been known since Herburger (1997) that English cardinal 'many' and 'few' are focus-sensitive. The following examples are from Babko-Malaya (1998).

(11) a. Many GIRLS are taking semantics this semester.
b. Many girls are taking SEMANTICS this semester.
c. Many girls are taking semantics THIS semester.

All these sentences have quite distinct truth conditions.

This is also the case for *mnogo*. Note: In Russian, focused constituents tend to be sentence-final.

(12) V etom semestre semantiku vybralo mnogo STUDENTOK.
in this semester semantics chose mnogo students.fem

(13) V etom semestre mnogo studentok vybralo SEMANTIKU.
in this semester mnogo students.fem chose semantics

(14) Mnogo studentok vybralo semantiku v ETOM semestre.
mnogo students.fem chose semantics in this semester

These sentences mean the same as their English counterparts.

However, 'mnogie' is not focus sensitive:

(15) Semantiku v etom semestre vybrali mnogie STUDENTKI.
semantics in this semester chose mnogie students.fem

(16) V etom semestre mnogie studentki vybrali SEMANTIKU.
in this semester mnogie students.fem chose semantics

(17) Mnogie studentki vybrali semantiku v ETOM semestre.
mnogie students.fem chose semantics in this semester

In these examples, focus does not affect the proportional interpretation of 'Mnogie studentki' is invariably interpreted as "a large proportion of female students." At best, focus leads to a contrastive interpretation.

2. Idea, informally

The meaning of *many* can be described as "large in number with respect to a comparison class." Put in these terms, the task is to explain why *mnogie* and *mnogo* restrict their comparison classes in the ways they do.

mnogie is like other gradable attributive adjectives. In most cases this means that its comparison class is determined by the nominal it combines with.

(18) a. #Bill is a tall basketball player, but he's not tall for a basketball player.
b. #Bil vysokij basketbolist, no on ne vysokij dlja basketbolista.

For simplicity we assume that this behavior is hard-wired into the lexical entries of 'mnogie' and of gradable attributive adjectives in general.

(We ignore exceptions to this rule: "Here comes a big tank", or "Look at the little butterfly." See e.g. Higginbotham (1985). We expect 'mnogie' to behave the same as gradable attributive adjectives. We haven't found any analogous cases with 'mnogie' and leave this as an open problem.)

As for ⟦mnogo⟧, since it is a focus-sensitive item, its comparison class is determined by the focus value of the clause it contains. The idea that cardinal readings are focus-sensitive readings is already present in Babko-Malaya for English 'many'. We extend this idea to Russian *mnogo* since it is focus-sensitive.

Informally: *mnogo* QRs like *only* in Rooth's focus semantics.

(19) Mnogo λd. [d-many girls are taking SEMANTICS]
= the number of ⟦girls (who) are taking semantics⟧ is significantly above the average of the focus alternatives to ⟦girls who are taking SEMANTICS⟧
= more girls take semantics than the average number of girls in a course

(20) Mnogo λd. [d-GIRLS are taking semantics]
= the number of ⟦girls (who) are taking semantics⟧ is significantly above the average of the focus alternatives to ⟦GIRLS who are taking semantics⟧
= more girls take semantics than the average of semantics-taking girls and semantics-taking boys

3. Implementation

3.1. 'Mnogie'

⟦mnogie⟧ combines with a nominal of type <et> and makes use of the cardinality measure function.

Preliminary entries:

(21) ⟦mnogie⟧ = λN. λx. |x| ≥ standard(N) & N(x)

(22) ⟦mnogie studenty⟧ = λx. |x| ≥ standard(students) & students(x)

We take from Barker (2002) (ultimately from Lewis (1970)) the idea that the adjective comes with its own delineation function (which we write "standard" -- informally, it returns the average of a given set). By keeping this function inside the adjective, we make sure that the standard is always computed based on the first argument that the adjective combines with.

This needs to be a bit more complicated since ⟦mnogie⟧ and other gradable adjectives like ⟦vysokie⟧ ("tall") pick out different standards.

Preliminary entries:

(23) a. ⟦mnogie studenty⟧ = λN. λx. |x| ≥ standard(N) & N(x)
b. ⟦vysokie studenty⟧ = λN. λx. height(x) ≥ standard(N) & N(x)

For example, standard(students) in (21a) might be any number; standard(students) in (21b) would typically be a height degree like 1.60m.

So we give "standard" a bit more information:

(24) a. ⟦mnogie⟧ = λN. λx. |x| ≥ standard(λx: N(x). λd. |x| ≥ d) & N(x)
b. ⟦tall/vysokie⟧ = λN. λx. height(x) ≥ standard(λx: N(x). λd. height(x) ≥ d) & N(x)

This may be different from world to world. So strictly speaking, "standard" takes more arguments, e.g. it takes an adjective and a world, but we ignore this.

3.2. 'Mnogo'

First let's account for the focus sensitivity of 'mnogo'. We write ⟦X⟧-ordinary for the ordinary (conventional) semantic value of X; ⟦X⟧-focus stands for its focus value, see Rooth (1992).

Preliminary entry:

(25) ⟦mnogo⟧ = λD. max(⟦D⟧-ordinary) ≥ standard(⟦D⟧-focus)

Again we want to give the standard function some more information:

(26) ⟦mnogo⟧ = λD. max(⟦D⟧-ordinary) ≥ standard(λx. λd : d ∈ ∪⟦D⟧-focus. |x| ≥ d)

We have seen earlier that 'mnogo' is focus sensitive. So like standard treatments of 'only', we assume that it QRs so it can see the entire clause.

Standard implementation: ⟦mnogo⟧ combines with something that expects an argument of type <d>, and undergoes QR due to type mismatch.

How is this possible given that we can say "mnogie studenty" as well as "mnogo studentov"?

Answer: 'mnogie studenty' is exactly what it looks like, with no silent elements. But *mnogo* is focus sensitive, so it needs to move to a position where it can access the focus value of the entire sentence. This leaves the question of what type its trace has. Here we see that *mnogo* has the same distribution as measure phrases:

(27) a. mnogo studentov
mnogo student.pl.Gen
b. dve tonny bobov
two tons bean.pl.Gen

(28) a. mnogie studenty
mnogie student.pl.Nom
b. *dve tonny boby
two tons bean.pl.Nom

Everybody agrees that the type of measure phrases is not <e>. We assume that its type is either <d> or something related to <d>. So the trace of 'mnogo' is of

type <d>. For it to combine with the noun, we need a type shifter μ. Following Schwarzschild (2006), we assume that μ is of type <et>, <d,<et>> .

(29) $[\![\mu_f]\!] = \lambda N.\ \lambda d.\ \lambda x.\ N(x) \ \&\ f(x) \geq d$, where f is a measure function of type <ed>

(30) $[\![\text{dve tonny } \mu_{\text{weight}} \text{ bobov}]\!] = \lambda x.\ \text{beans}(x) \ \&\ \text{weight}(x) \geq 2.\text{tons}$

(31) $[\![\text{d } \mu_{\text{card}} \text{ studentov}]\!] = \lambda x.\ \text{students}(x) \ \&\ \text{card}(x) \geq d$

(32) $[\![\text{d } \mu_{\text{card}} \text{ students came}]\!] = \lambda x.\ \text{students}(x) \ \&\ \text{card}(x) \geq d \ \&\ \text{came}(x)$

(33) $[\![\text{mnogo}]\!] = \lambda D.\ \max([\![D]\!]\text{-ordinary}) \geq \text{standard}(\lambda x.\ \lambda d : d \in \cup[\![D]\!]\text{-focus}.\ |x| \geq d)$

(34) mnogo λd [d μ_{card} students CAME] :=
$\max(\lambda d.\ \exists x$: students(x) & card(x) ≥ d & came(x)) ≥ standard(λx. λd:
$d \in \cup\{\ \lambda d.\ \exists x$: students(x) & card(x) ≥ d & Alt(x) | Alt ∈ [[came]]-focus}.
|x| ≥ d)
(The number of children who came is at least the average of the focus value of [[λd [d μ students CAME]]] (which are other situations in which children did something)

Now let's consider why *mnogo* doesn't have proportional readings in the normal case.

(35) [[mnogo girls are taking semantics]]

We assume that there are 100 girls and 100 boys and that the salient groups are girls and boys.

Proportional reading:

(36) More than half the girls are taking semantics. (i.e. more than 50 girls)

Actual readings:

(37) [[mnogo GIRLS are taking semantics]] = the number of girls taking semantics exceeds the average size of a salient semantics-group.

Suppose that 30 boys are taking semantics and 40 girls are taking semantics. The average size of a salient semantics-taking group is 35. The sentence is true but the proportional reading is false.

(38) [[mnogo girls are taking SEMANTICS]] = the number of girls taking semantics exceeds the average size of a salient girl group.

Suppose that the salient groups of girls are phonology-takers, syntax takers, and semantics takers. Suppose their sizes are 20, 30, and 40 respectively (average = 30). Then the sentence is true but the proportional reading is false.

Note: there is a possibility to get a reading that is equivalent to the proportional reading, but only in a context where there are exactly two salient groups and they partition the set of girls:

(39) [[mnogo girls are TAKING SEMANTICS]] = the number of girls taking semantics exceeds the average size of a salient girl group.

Suppose that the salient groups of girls are semantics-takers and non-semantics takers.

Actually this prediction is true – though this has not been observed before:

(40) V etom semestre mnogo studentok VYBRALO semantiku.
in this semester mnogo students.fem chose semantics
Reading: 'More students are taking semantics than not taking it.'

4. Outlook

In English there is a debate on whether there is one or two 'many's.

A long-standing debate revolves around whether this behavior is due to lexical ambiguity (Milsark (1974); Partee (1989)), pragmatic underdetermination (Löbner (1978)), or differences in scale structure (Solt (2009)).

Solt (2009) has shown that English 'many' is not a gradable adjective syntactically.

English might be like Russian – two 'many's – just that they sound the same.

However: English might also only have one 'many' whose comparison class is neither constrained by the head noun, nor by focus, i.e. it is pragmatically determined.

The distinction between English *many* and Russian *mnogo* might be analogous to the one that Beaver and Clark (2008) propose for English *only* and *always*. Only the former is directly focus-sensitive. The focus-sensitivity of the latter results from its dependency on context, and from the fact that focus also reflects what is given in the context.

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