

How *many* maximizes in the Balkan Sprachbund*

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I. Introduction.

In Romanian (as well as Bulgarian and Macedonian), the monomorphemic ‘how many’ word *cît* can optionally combine with the word ‘many’ (*mult*). While *cît* questions exhibit the same properties as ‘how many’ questions in English, *cît de mult* questions differ in a number of ways. This paper focuses on the fact that *cît de mult* questions (as opposed to *cît* questions) are infelicitous in downward- and non-scalar constructions, suggesting that the semantic contribution of *mult* in ‘how many’ questions yields a maximality effect (Beck & Rullman 1999). I derive this effect without postulating a maximality operator by analyzing *mult* as a predicate over sets of degrees.

II. Data.

Both of the Romanian forms in (1) elicit a number response and are best glossed as *how many*.

- (1) a. Cîte femei ştie?
cît-Fpl women know.3sg
b. Cît de multe femei ştie?
cît of many women know.3sg
How many women does he know?

Mult occurs everywhere the English *many* occurs (e.g. ‘He met many people’). One main difference between the two constructions in (1) is the extent to which they exhibit maximality effects: *cît* constructions are compatible with downward-scalar and non-scalar questions while *cît de mult* constructions are not (see (2)).

- (2) We have few eggs left in the house.
a. Cîte ouă ajung ca să iasă prăjitura bună?
cît-Fpl eggs are.enough compl Subj-prt come.out cake good
b. *Cît de multe ouă ajung ca să iasă prăjitura bună?
cît of many-Fpl eggs are.enough compl Subj-prt come.out cake good
How many eggs are sufficient so that the cake comes out good?

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III. Analysis.

The motivation for saying that words like *many* and *much* are predicates over sets of degrees rather than individual quantifiers comes from a) the fact that these words can occur with non-NPs (with a DegP in ‘many more people’ and with a PP in ‘much over the speed limit’); and b) their behavior in comparatives. (3) is used to capture the meaning of *many* in these contexts (Schwarzschild 2002):

$$(3) \quad \llbracket \text{many} \rrbracket = \lambda d \lambda D. |D|=d \quad (\text{where } |\alpha| \text{ gives the cardinality of } \alpha)$$

In the past, *many* has been considered an individual quantifier that additionally endows the NP with a degree argument (see esp. Hackl 2000). But there are reasons to think that the individual quantifier is more closely associated with the NP than with *many*: the fact that *many* is optional in Romanian *how many* constructions, for one, and evidence from the behavior of split-NPs in French *combien* constructions like (4): the low pronunciation of the NP is sufficient to force the low interpretation of the individual quantifier.

- (4) a. Combien de livres faut-il que vous lisez? $\checkmark \exists \gg \square, \checkmark \square \gg \exists$
 how.many of books it’s.necessary that you read
 b. Combien faut-il que vous lisez de livres? $* \exists \gg \square, \checkmark \square \gg \exists$
 how.many it’s.necessary that you read of books
How many books must you read?

I associate the individual quantifier with an independently-motivated morpheme on the NP that also gives the noun a degree variable. I call it ‘PL’ after a similar operator in Cresswell (1976).

$$(5) \quad \llbracket \text{PL} \rrbracket = \lambda P \lambda d \lambda Q \exists X. P(X) \ \& \ Q(X) \ \& \ |X|=d$$

Both constructions in (1) contain *cît*, which I analyze as in (6). This way of analyzing *cît* is supported by the fact that *cît* can occur with adjectives in Romanian (assuming that the adjective first combines with its subject to yield a set of degrees): *Cît de înaltă esti?* is ‘How tall are you?’.

$$(6) \quad \llbracket \text{cît} \rrbracket = \lambda D \lambda p \exists d. p = D(d)$$

In *cît* constructions like (1-a), *cît* quantifies over the set of degrees PL associates with the NP:

- (7) *Cîte women does he know?* = $[_{CP} \text{cît}_{d_1} [\text{t}_{d_1} \text{PL women}]_X [_{IP} \text{he knows t}_X]]$
 a. $\llbracket \text{he knows t}_X \rrbracket = \lambda X. \text{knows}(\text{he}, X)$ (after λ -abstraction of the trace X)
 b. $\llbracket \text{PL women} \rrbracket = \lambda d_1 \lambda Q \exists X. \text{women}(X) \ \& \ Q(X) \ \& \ |X|=d_1$
 c. $\llbracket \text{t}_{d_1} \text{PL women} \rrbracket = \lambda Q \exists X. \text{women}(X) \ \& \ Q(X) \ \& \ |X|=d_1$
 d. $\llbracket \text{t}_{d_1} \text{PL women he knows t}_X \rrbracket = \lambda d_1 \exists X. \text{women}(X) \ \& \ \text{knows}(\text{he}, X) \ \& \ |X|=d_1$
 (after λ -abstraction of the trace d_1)
 e. $\llbracket \text{Cîte t}_{d_1} \text{PL women he knows t}_X \rrbracket = \lambda p \exists d_1. p = \exists X. \text{women}(X) \ \& \ \text{knows}(\text{he}, X) \ \& \ |X|=d_1$

The semantics in (7) yields a set of all true possible answers to the question *How many women does he know?*. If he knows 5 women, for instance, that set will be {He knows 1 woman, He knows 2 women... He knows 5 women}. In the cases of *cît* questions (and other constructions compatible with downward-scalar questions, like *how many* questions in English), I assume with Beck & Rullman 1999 that pragmatics is responsible for a sense of maximality here.

The semantics of *cît de mult* constructions like (1-b) work slightly differently. In these

cases it's *mult*, rather than *cît*, taking as its argument the set of degrees associated with the NP. It returns a degree d_2 that is the size of the set of d_1 degrees. Because d_2 will always be the same number as the highest number in the set of d_1 s (given the assumption that, for instance, if there are d -many x s then there are also d' -many x s for all integers d' where $d > d' > 0$), *many* effectively works as a maximality operator despite its actually being a cardinality operator. d_2 is then λ -abstracted over to yield the singleton set $\{d_2\}$. It is this set that *cît* quantifies over.

- (8) *Cît de multe* women does he know? = [CP $cît_{d_2}$ [t_{d_2} *multe*] $_{d_1}$ [t_{d_1} PL women] ...]
- $\llbracket t_{d_1}$ PL women he knows $t_X \rrbracket = \lambda d_1 \exists X. \text{women}(X) \ \& \ \text{knows}(\text{he}, X) \ \& \ |X| = d_1$
 - $\llbracket t_{d_2}$ *multe* $\rrbracket = \lambda D. |D| = d_2$ (from (3))
 - $\llbracket t_{d_2}$ *multe* t_{d_1} PL women he knows $t_X \rrbracket = \lambda d_2. | \lambda d_1 \exists X. \text{women}(X) \ \& \ \text{knows}(\text{he}, X) \ \& \ |X| = d_1 | = d_2$ (after λ -abstraction of d_2)
 - $\llbracket cît \ t_{d_2}$ *multe* t_{d_1} PL women he knows $t_X \rrbracket = \lambda p \exists d_2. p = | \lambda d_1 \exists X. \text{women}(X) \ \& \ \text{knows}(\text{he}, X) \ \& \ |X| = d_1 | = d_2$

In *cît* constructions, quantification is over a set of degrees that are true of the predicate. In *cît de mult* constructions, quantification is over the singleton set whose member is the size of the set of degrees that are true of the predicate. For downward-scalar questions, this set is infinite, which explains why *cît de mult* is unacceptable in (2). For standard, upward-scalar questions like (1), the derivations in (7) and (8) are equivalent, with *cît* constructions achieving maximality through a pragmatic condition on maximal informativeness.

IV. Conclusion.

This analysis suggests that Beck & Rullman (1999) were right to argue that, standardly, questions do not involve a maximality operator (and that a maximal answer in these constructions is achieved pragmatically). I've also pointed to a different source of maximality, one encoded in the semantics of *many*. I account for the effects in (2) with a compositional and independently-motivated definition of *many* that does not require the postulation of a maximality operator as it is usually construed (e.g. in Rullman 1995).

The paper goes on to extend this analysis without significant amendment to address the nature of the interaction of these constructions when they can take (gradable) AdjP and VP complements (in Macedonian and Bulgarian). I also discuss the observed scopal restrictions of the bimorphemic phrases: while the NP in *cît* constructions can take either wide or narrow scope with respect to, for instance, a necessity modal, NPs in *cît de mult* constructions can only take narrow scope.

IV. References.

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