How *many* maximizes in the Balkan Sprachbund*

Jessica Rett
Rutgers University
hughesj@rutgers.edu

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 știe?
   *cît*-Fpl women know.3sg
b. Cît de multe femei știe?
   *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) \[ \text{[many] = } \lambda d \lambda D. |D| = d \]  
(where \(|\alpha|\) 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? how many of books it’s necessary that you read 
   b. Combien faut-il que vous lisez de livres? 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) \[ \text{[PL] = } \lambda P \lambda d \lambda Q \exists X. P(X) & Q(X) & |X| = d \]

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) \[ \text{[cît] = } \lambda D \lambda p \exists d. p = D(d) \]

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

(7) Cite women does he know? = [CP cît d1 [ t d1 PL women |X [IP he knows t X ] ]
   a. \[ \text{[he knows t X] = } \lambda X. \text{knows}(he,X) \]  
      (after \(\lambda\)-abstraction of the trace \(X\))
   b. \[ \text{[PL women] = } \lambda d_1 \lambda Q \exists X. \text{women}(X) & Q(X) & |X| = d_1 \]
   c. \[ \text{[t d PL women] = } \lambda Q \exists X. \text{women}(X) & Q(X) & |X| = d_1 \]
   d. \[ \text{[t d PL women he knows t X] = } \lambda d_1 \exists X. \text{women}(X) & \text{knows}(he,X) & |X| = d_1 \]  
      (after \(\lambda\)-abstraction of the trace \(d_1\))
   e. \[ \text{[Cît t d1 PL women he knows t X] = } \lambda p \exists d_1. p = \exists X. \text{women}(X) & \text{knows}(he,X) & |X| = d_1 \]

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 cit, 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 \( \lambda \)-abstracted over to yield the singleton set \( \{d_2\} \). It is this set that cit quantifies over.

\( \text{(8)} \)  

\begin{align*}
\text{Cit de multe women does he know?} & = [CP \ cit_{d_2} [t_{d_2} \text{ multe }]_{d_1} [t_{d_1} \text{ PL women } ] ...] \\
\text{a. } [t_{d_1} \text{ PL women he knows } t_X] & = \lambda d_1 \exists X. \text{women}(X) \& \text{knows(he,X)} \& |X| = d_1 \\
\text{b. } [t_{d_2} \text{ multe }] & = \lambda D. |D| = d_2 \\
\text{ (from (3))} \\
\text{c. } [t_{d_2} \text{ multe } t_{d_1} \text{ PL women he knows } t_X] & = \\
\lambda d_2. \mid \lambda d_1 \exists X. \text{women}(X) \& \text{knows}(he,X) \& |X| = d_1 \mid = d_2 \text{ (after } \lambda \text{-abstraction of } d_2) \\
\text{d. } [\text{cit } t_{d_2} \text{ multe } t_{d_1} \text{ PL women he knows } t_X] & = \\
\lambda p \exists d_2. p = \mid \lambda d_1 \exists X. \text{women}(X) \& \text{knows}(he,X) \& |X| = d_1 \mid = d_2
\end{align*}

In cit constructions, quantification is over a set of degrees that are true of the predicate. In cit 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 cit de mult is unacceptable in (2). For standard, upward-scalar questions like (1), the derivations in (7) and (8) are equivalent, with cit 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 cit constructions can take either wide or narrow scope with respect to, for instance, a necessity modal, NPs in cit de mult constructions can only take narrow scope.

IV. References.

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