Two types of proportional MOST in non partitives
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1. Background. Three types of analyses have so far been proposed for the proportional quantifier MOST: (i) the GQT analysis, (ii) Matthewson's (2001) entity-restrictor analysis and (iii) Hackl's (2009) superlative-based analysis. Each of these proposals implicitly or explicitly assume a unified analysis of MOST across languages and across syntactic configurations. We will instead show – based on distributional evidence - that we need to distinguish between three types of proportional MOST: one type for partitives and two for non partitives. For reasons of space we will concentrate on the two non-partitive MOST's and we will argue that both of them are to be analyzed as quantificational determiners, which means that in both cases MOST is immediately dominated by Nmax (compare the superlative MOST, which sits in Spec,Meas (on a par with MANY/MUCH), lower than the D° level of representation). The two MOST's are nevertheless syntactically different, which explains the difference in distribution and denotation.

2. The distributive quantifier MOST (MOST$_{dist}$). Romanian, Hungarian and Icelandic (for lack of space, only Rom is illustrated here) are three unrelated languages in which MOST (the superlative of MUCH/MANY) can have the proportional reading when its sister is a count NP but not when it is a mass NP (Szabolcsi 2012, Dobrovie-Sorin 2013):

(1) a. Cei mai mulţi elevi   din clasa mea au plecat devreme.   (Rom.)
        the more many students in class-the my have left   early. (MANY$_{superl}$)
        'Most students in my class left early.'
    b. *Cel   mai mult lapte de capre bătrâne e acru.   (MUCH$_{superl}$)
        the more much milk of goats old   is sour.

If we leave aside generic contexts, the English *most* shows the same constraint, e.g., *Most students in my class are hard working* vs *Most butter in the fridge is expired*. [Note: in all these languages relative superlative readings of MOST NP$_{mass}$ are allowed, e.g., Rom. *Cine a băut cel mai mult vin?* 'Who drank the most wine?']. The ban on mass quantification argues against analyzing MOST as an absolute superlative (*contra* Hackl 2009). We will instead assume the traditional GQT analysis (Mostowski 1957) given in (2), corresponding to (1)a:

(2) $|\{x: student(x)\} \cap \{left\text{-}early(x)\}| > |\{x: student(x)\} \cap \{not\text{-}left\text{-}early(x)\}|$

This formula is obtained by applying the denotation of MOST given in (3) to the two properties/sets that are respectively denoted by the NP-restrictor (*elevi* 'students') and the nuclear scope (*au plecat devreme* 'left early'). Note that in Romanian (as well as in the other languages referred to above, with the exception of Hungarian) the NP sister of MOST is plural-marked, and as such it denotes a set of pluralities. In order to obtain quantification over sets of *atoms* we need to assume that it is MOST itself that introduces the restriction to atoms. The subscript *dist* signals obligatory distributivity, which is the hallmark of this type of MOST:

(3) $\llbracket MOST_{dist} \rrbracket = \lambda P. \lambda Q. |\{x: P(x) \wedge Atom(x)\} \cap \{x: Q(x)\}| > |\{x: P(x) \wedge Atom(x)\} - \{x: Q(x)\}|$

3. The cumulative quantifier MOST (MOST$_{cum}$). (4) shows that the German *meiste* 'MUCH/MANY$_{superl}$' contrasts with its Rom and Hung (apparent) correlates by allowing mass NPs:

(4) Maria hat den meisten Kaffee in dieser Kanne getrunken
    'Mary drank most of the coffee in this pot'

The German pattern can be found in other Germanic languages (Dutch, Swedish), Basque and Greek, a.o. The same languages allow collective quantification with MOST, e.g., Die meisten Kollegen werden sich morgen treffen / versammeln 'the most colleagues will gather, Most of the colleagues will meet/gather tomorrow.' MOST$_{cum}$ is a cover term for MOST+NPmass and MOST+ NPpl. When combined with NPpl, **MOST$_{cum}$** allows for both collective and distributive readings (due to the fact that plural predication allows for distributivity).

After briefly explaining why even this type of MOST cannot be assumed to rely on a superlative, we will propose that the proportional *meiste* can also be analyzed as a quantificational determiner (on a par with MOST$_{dist}$), albeit of a distinct semantic type. Following Lønning (1987) and Higginbotham (1994), we will assume that mass quantifiers impose constrain relations between entities rather than relations between sets (note however that our proposal is crucially different wrt to the syntactic analysis, see § 6 below). According to Higginbotham, the two entities that are related by the mass quantifier are obtained by applying the maximality operator (notated σ) to the two arguments of the quantifier, the NP-restrictor and the nuclear scope:

(5) a. $\llbracket MOST_{cum} \rrbracket = \lambda P \lambda Q\ \mu(\sigma x.P(x) \cap \sigma z.Q(z)) > \mu(\sigma x.P(x) - \sigma z.Q(z)))$

b. ⟦(der) meiste Kaffee ⟧ = $\lambda Q. \mu(\sigma x.\text{coffee}(x) \cap \sigma z.Q(z)) > \mu(\sigma x.\text{coffee}(x) - \sigma z.Q(z)))$

The *meet* (∩) of two entities *x* and *y* is the maximal sum of everything which is a part of both *x* and *y*. The *difference* (or complement) of *x* and *y* is the maximal sum of the parts of *x* which do not overlap with *y*. The formula in (5) requires that (the measure of) the meet of the maximal sum in P with the maximal sum in Q be larger than the difference between these two maximal sums.

4. Syntax-semantics: from measuring modifiers to quantificational Det's. The two denotations of proportional MOST given in (3) and (5) are alike insofar as they compare the meet of their restrictor and nuclear scope with the difference. Compositionality requires this semantics to correspond to syntactic configurations in which MOST is immediately dominated by the maximal nominal projection (DP). Compare quantitative modifiers (MANY, MUCH and their superlative MOST), which sit in Spec,Meas°, below D°:

(6)   [$_{DP}$D° [$_{MeasP}$ Spec, Meas [$_{Meas'}$Meas° NP]]]]   **Quantitative modifiers**

a.	the	most	coffee	(Engl)
a'.	the	most	students	
b.	Ø	[cea mai multà]	cafea	(Romanian : glosses = Engl above)
b'.	Ø	[cei mai multi]	studenti	
c.	der	meiste	Kaffee	(German : glosses = Engl above)
c'.	die	meiste	Studenten	

What we need now is to map this syntactic configuration to a maximally similar one in which MOST is immediately dominated by DP. And since we have identified two distinct types of MOST's we expect to be able to identify two distinct configurations in which proportional MOST is immediately dominated by DP.

5. MOST$_{dist}$ sits in Spec,D+Meas. For MOST$_{dist}$ we will provide evidence in favor of the representation in (7), obtained from (6) via Head Merger (constrained by adjacency) of D° with Meas° and insertion of MOST in the Spec of the complex Head [$_{D°}$D°+Meas°]:

(7)   [$_{DP}$ Spec, D°+Meas° [$_{D'}$[$_{D°}$D°+Meas°] NP]]]]

a.	*most	coffee	
a'.	most	students	
b.	*[cea mai multà]	cafea	(Romanian : glosses = Engl above)
b'.	[cei mai multi]	studenti	

Evidence in favor of this syntactic representation: (i) absence of *the* in English for proportional *most* (compare presence of *the* for the relative superlative reading, e.g., *Who examined the most students?*); (ii) in Romanian, there is evidence in favor of THE (*cel/cea/cei/cele*) being part of the superlative, which may occupy not only Spec,Meas (as in (6)b, but also Spec,DP (Giurgea 2013, Cornilescu and Giurgea 2013) and finally the Spec of the complex head D°+Meas°, as proposed here. For Hungarian there is no morphosyntactic evidence in favor of the proportional *a legtöbb* 'the most' being a constituent sitting in the Spec of a complex head D°+Meas°, but there is no argument against such an analysis either.

6. LF raising of MOST. Turning now to the German *meiste*, we will propose that at LF, MOST raises from Spec,Meas to Spec,D:

(8)   [$_{DP}$ Spec,D [$_{D'}$D° [$_{MeasP}$ Spec, Meas [$_{Meas'}$Meas° NP]]]]

↑	der	meiste	Kaffee
ǀ	die	meiste	Studenten
ǀ _____ ↓

An important advantage of this analysis is that the sigma operator, on which the denotation in (5)a crucially relies, is not a type-shifter but instead corresponds to the definite article (which is bypassed by MOST$_{cum}$). We also explain why in all the languages that have articles, MOST$_{cum}$ requires the presence of the definite article: since it is needed for the semantics, the definite article cannot be dispensed with. Compare MOST$_{dist}$: its semantics does not rely on the sigma operator, and correlatively, according to the analysis proposed in § 5 above, the definite article is not present in the underlying configuration, in which D° is not distinct from Meas°.

References

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