Two types of proportional MOST in non partitives

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0. Overview. The first goal of the presentation is empirical. We will establish a distinction that has gone unnoticed in the previous literature (Matthewson 01, Hackl 09, Coppock et al. 17) between two proportional MOSTs (by 'MOST' we mean the superlative form of MANY/MUCH) in non-partitives, which differ by their subcategorization properties and interpretation (§1). In §2 we propose that both of the two MOSTs are quantificational Determiners (contra Hackl's widely assumed superlative analysis), which nevertheless differ in semantic type: one of them denotes relations between sets (see the GQT analysis of MOST) whereas the other one denotes relations between (parts of) entities (see Higginbotham's 94 analysis of mass quantifiers). Although they are able to capture the data described in §1, the proposed denotations cannot explain the different constraints the two MOSTs impose on the distribution of the definite article (§2). Moreover, we do not understand why we find two, and only two, types of non-partitive MOST across languages (based on questionnaires, we have gathered data from around 40 languages). Why not just one MOST? Why not three? In order to answer these questions we need to supplement our semantic analyses with syntactic analyses. The core idea will be that *qua* quantificational Det's, both of the two proportional MOSTs carry a categorial feature D, which requires MOST to target D° (or Spec, D°). This requirement can be satisfied either by First Merge in D°/Spec,D or by LF movement from Spec,Meas to Spec,D. Since these are the only two possible ways of satisfying the D° feature of MOST inside a non-partitive configuration, we explain why only two proportional MOSTs can be found in non-partitives crosslinguistically.

1. The distributive and the cumulative MOST (MOST$_{dist}$, MOST$_{cum}$). 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 12, Dobrovie-Sorin 13):

(1) a. Cei mai mulţi elevi   din clasa mea au   plecat devreme.   (Rom.)
       the more many stud in class-the my have left   early. 'Most stud in my class left early.'
    b. *Cel mai mult unt din frigider e perimat.
       the more much butter in the fridge is expired

If we leave aside generic contexts, the English *most* shows the same constraint, e.g., *Most students in my class left yesterday* 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 example in (2) shows that the German *meiste* 'MUCH/MANY$_{superl}$' contrasts with its Rom and Hung (apparent) correlates in that it allows mass NPs:

(2) Maria hat den meisten Kaffee auf dem Teppich verschüttet.

     Maria has the most coffee on the carpet spilled. "Maria spilled most of the coffee on the carpet"

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). Rom, Hung and Engl only allow distributive readings of MOST, hence the label **MOSTdist**.

2. Two proportional quantificational determiners. The ban on mass quantification argues against analyzing MOST$_{dist}$ as an absolute superlative (*contra* Hackl 2009). We will instead assume the traditional GQT analysis (Mostowski 1957) given in (3) corresponding to (1)a:

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

This formula is obtained by applying the denotation given in (4) to the two properties/sets that are respectively denoted by the NP-restrictor (*elevi* 'students') and the nuclear scope (*au plecat devreme* 'left early'):

(4) ⟦MOST$_{dist}$⟧ = λP. λQ. |{x: P(x)} ∩ {x: Q(x)}| > |{x: P(x)} - {x: Q(x)} |

Turning now to MOST$_{cum}$, we will assume that it denotes a relation between two (parts of) entities (see Lønning (87) and Higginbotham (94) on mass quantifiers), which are obtained by applying the maximality operator (notated σ) to the two arguments of the quantifier:

(5)a. ⟦MOST$_{cum}$⟧ = λP λQ μ(σx.P(x) ∩ σz.Q(z)) > μ(σx.P(x) - σz.Q(z)))

   b. ⟦(der) meiste Kaffee ⟧ = λQ. μ(σx.coffee(x) ∩ σz.Q(z)) > μ(σx.coffee(x) - σz.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)a 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. This proposal cannot explain the following generalizations: (i) in English, MOST$_{dist}$ is in complementary distribution with THE; (ii) MOST$_{cum}$ must co-occur with THE (unless a possessor is present) or a 'general' Det (see Basque) in all the languages in which it is found. The generalization in (ii) is all the more striking that in some of the languages that have MOST$_{cum}$, the definite article is absent for the relative superlative reading of MOST. Moreover, we cannot explain why two proportional MOSTs should exist. In principle, we would expect only one denotation per quantificational Det. And if distinct denotational types are allowed for one and the same quantificational Det, why are there only 2 proportional MOSTs? In particular, why don't we have a third possible MOST, that would apply to singular count NPs, e.g., *die meiste Tisch* 'the most table' meaning 'most of the table'? As far as we can tell, this third type is universally ruled out. The answer to the puzzle will be that proportional MOST carries a categorial feature D, which requires MOST to land in D° or Spec,D either in the overt syntax, via First Merge, or at LF, via movement from Spec,Meas. These two options correlate with absence vs presence of a definite article and with (im)possibility of combining with mass NPs.
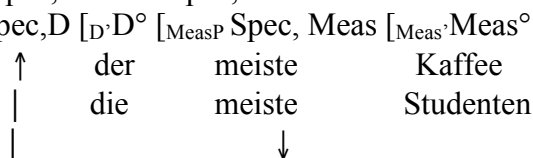
3. MOST$_{dist}$ sits in D° or in Spec,D. The representations in (6), where MOST$_{dist}$ is merged either in D° or in Spec,D are supported by the following facts: **(i)** absence of *the* in English for proportional *most* (compare presence of *the* for the relative superlative reading, e.g., *Who examined the most students?*). The choice of D° rather than Spec,D is based on examples like *John's most novels*. **(ii)** in Romanian, there is evidence in favor of THE (*cel/cea/cei/cele*) being part of the superlative, which sits in Spec,DP (Giurgea 13, Cornilescu & Giurgea 13).

(6)   [$_{DP}$ Spec, D°   [$_{D'}$ D°   NP]]
a.   most   students
b.   [cei mai multi]   studenti   (Romanian : gloss = Engl above)

[Note: The obligatory presence of the definite article *a* in Hungarian (not illustrated here) can be attributed to the more complex internal structure of Hung DPs, which have a Comp-like layer in addition to the D-layer (Szabolcsi 94).

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

(7)   [$_{DP}$ Spec,D [$_{D'}$D° [$_{MeasP}$ Spec, Meas [$_{Meas'}$Meas° NP]]]]
              ↑   der   meiste   Kaffee
              | die   meiste   Studenten
              |_____↓

An important advantage of this analysis is that the sigma operator, on which the denotation in (5)a crucially relies, is not a purely semantic 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.

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