Proportional quantifiers and partitivity

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Synopsis – There is a puzzling asymmetry between English partitive and non-partitive most-phrases: only the partitives participate in cumulative/collective readings. We argue that this is due to (i) the generic nature of sentences with the non-partitive most, and (ii) the unavailability of cumulative/collective readings in generics.

Data – A. It has been observed that non-partitive most-phrases do not allow collective readings with mixed predicates, while their partitive counterparts do (1) (Nakanishi & Romero 2004).

(1) [Scenario: 60% of the boys in the room jointly lifted the piano]
   a. Most boys lifted the piano
   b. Most of the boys lifted the piano

B. Non-partitive most-phrases do not participate in cumulative readings with numeral DPs (2-a) (Zweig 2008). However, this does not extend to sentences with most of the NP (2-b) (confirmed in an informal survey, cf. Beck and Sauerland 2000 for pragmatic factors in cumulativity).

(2) [Scenario: 60% of the boys each kissed one girl, a total of two girls were kissed by a boy]
   a. #Most boys kissed the two girls
   b. Most of the boys kissed the two girls

C. Non-partitives do not participate in cumulative readings even in environments where these are available for distributive quantifiers like every NP; partitives are not subject to this restriction. One such environment are sentences where the quantifier is the direct object of a transitive verb (3) (Kratzer 2003). (3) and (4) suggest that the non-cumulativity observed with non-partitives cannot be due simply to their generalized quantifier semantics (e.g. Nakanishi & Romero 2004).

(3) [Scenario: three boys between them admired every girl, though each one admired girls of a different type] Three boys admired every girl
(4) [Scenario: as above, though only 70% of the girls are admired]
   a. #Three boys admired most girls
   b. Three boys admired most of the girls

D. There is a systematic set of exceptions to the above generalizations about the non-partitive most: if the bare plural complement of most is modified by an episodic relative clause, the non-partitive does participate in cumulative/collective readings. This is illustrated in (5), where a collective interpretation of the mixed main predicate is possible.

(5) Most people who were sitting there lifted the piano

Partitive and non-partitive most – The partitive and the non-partitive most have the same semantics: their first argument is an individual, while their second argument is a predicate (Matthewson 2001). However, there is a difference between what sorts of individuals feature in the two cases. This correlates with an observation by Cooper (1996) and Matthewson (2001) which says that sentences with non-partitive most-phrases tend to be generic and that most does not allow contextual restrictions. An example of this pattern is given in (6).

(6) a. Most linguists are millionaires
   b. #Most linguists went to New Zealand for Christmas last year

Following Matthewson (2001), we assume that the bare plural sister of the non-partitive most denotes a kind, while the first argument of the partitive most is a regular plural individual (of is semantically vacuous). Since kinds are of argumental type e (Chierchia 1998), we propose that most has the uniform lexical entry in (7) (in the following, a superscript k for kinds is used for readability).

(7) [most] = λx.e.λP(e,(v,t)).λe.v. ∃y≤x. P(e,y) ∧ [µ(y) > 12µ(x)]

Finally, if a non-kind-level predicate applies to a kind, it can only be generic or a derived kind predicate (cf. Chierchia 1998 for derived kind predication). The latter option is pragmatically precluded in the cases at hand because most dogs barked would have the same meaning as the simpler (some) dogs barked (8). This explains the genericity effect with the non-partitive most.

(8) ∃e.∃y<≤dogs x. ∃z[R(y,z) ∧ bark(e,z)] ∧ [µ(y) > 12µ(dogs)] ≡ ∃e.∃z.[dogs(z) ∧ bark(e,z)]

Partitive most and cumulation – The cumulative/collective readings are derived using the approach to plurality developed in Kratzer (2003) in which lexical predicates are plural (** indicates cumulation). The derivation of the cumulative reading of (2-b) is illustrated in (9).

Analogous derivations deliver collective readings of mixed predicates, whereby the relevant cumulated predicate is the respective activity head (cf. Brisson 1998, Nakanishi and Romero 2004). This explains the partitive data in A-C.
receive cumulative interpretations in such configurations (3) follows

(12) a. Seven trains leave every day to Amsterdam from this station (#cumulative)
could be explained in a similar way. It is suggestive that both sentences in (12) are generic.

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Further questions – 1. An obvious question is whether other intriguing contrasts (12) that Zweig (2008) uses to argue for the non-reduction of dependent plurals to cumulative readings could be explained in a similar way. It is suggestive that both sentences in (12) are generic.

(12) a. Seven trains leave every day to Amsterdam from this station (#cumulative)
b. Trains leave every day to Amsterdam from this station (✓ dependent plural)

2. Non-partitive mass most-phrases are subject to a homogeneity restriction: they can only combine with predicates that are cumulative and divisive (13-a) (cf. Lønning 1987, Moltmann 1997). The partitive most-phrases are more lenient in this respect (13-b) (cf. Bunt 1985, Moltmann 1997 for facts with all). On the one hand, the homogeneity with non-partitives arguably follows from genericity and the fact that there are no cognitively relevant minimal realizations of masses (cf. Soja, Carey and Spelke 1991 and others), resulting in distribution over all the realizations. On the other hand, heterogeneous readings with partitives can be derived analogously to (9).

(13) a. #Most water contains ten grams of salt
b. [Scenario: 2 out of 3 bottles of water in front of us each contain 10g of salt]

Most of the water (in front of us) contains ten grams of salt