The partitive structure of quantification

Quantifiers that appear in and define the structure of the determiner phrase (DP) are traditionally analyzed as taking a noun phrase (NP) complement at Logical Form (LF) (henceforth, Q+NP). This paper contributes to a growing body of work (cf. Matthewson, 2001; Gagnon, 2013; and Greer, 2014) that suggests that this position is instead occupied by a partitive prepositional phrase (PP), as schematized (roughly) in (1) (henceforth, Q+PP) (non-branching bar levels are omitted for clarity).

\[(1) [DP [O Q] [PP [P of] [DP [O {the/DEF} [NP N]]]]] \]

To account for the variation between overt Q+PP and Q+NP structures, I make two claims: first, the head of the partitive PP, of, is semantically vacuous and may therefore be null at surface structure, and second, the head of the embedded DP may either be the overt definite determiner the or a null variant of this determiner, which I call D_{DEF}.

I offer two new arguments in support of this partitive structure. The first is syntactic: evidence from Wh-extraction in English indicates that partitive of must be associated with a quantifier at some level of structure.

\[(2)\]
\[\begin{array}{l}
\text{a. I sold \{every/each\} book. > What did you sell \{every/each\} *(one of) t_k?} \\
\text{b. I sold \{both/many/few/some/several\} a (one) two/no (none) all/most} \\
[\text{NP book(s)}]_k > \text{What did you sell \{both/many/few/some/several/one/two/none/all/most\} *(of) t_k?}
\end{array}\]

In addition to explaining the "spurious" of in the interrogatives in (2), the structure in (1) accounts for the fact that the most natural response to these questions is a full DP (i.e., those books, my books, the books I found in the garage), a DP that is not recoverable from the traditional, Q+NP LF. The second argument is pragmatic: the structure in (1) reduces the presuppositions of quantification to the presuppositions of the definite article. Quantifiers presuppose both that there is a domain in which they are evaluated (cf. Moltmann, 2005) and that this domain is restricted. Given (1), these can be viewed as manifestations of the existence and uniqueness presuppositions, respectively, of the embedded definite article.

Finally, I offer a novel proposal for extending the partitive structure to the quantifier every, which is notoriously problematic for a Q+PP structure. While most quantifiers (many, few, some, several, no, and even, I will show, all and most) take the PP directly as their syntactic complement, every (along with each and both) combines with this phrase indirectly via an NP headed by one, as schematized in (3).

\[(3) [DP [O Q] [NP [O one] [PP [P of] [DP [O {the/DEF} [NP N]]]]]] \]

In addition to accounting for surface facts (i.e., every *(one) of, each (one) of, and the fact that in the absence of an overt partitive, every and each combine with a singular noun), this one-NP facilitates the semantic composition of these strong determiners with the partitive PP: one acts as a "down-stepping" function (Ladusaw, 1982) that converts the GQ denoted by the PP into an argument of the appropriate type (a set) for the quantifier. It also imposes a constraint on its output that any supersets formed on it by the higher quantifier must denote individual-level predicates, accounting for the fact that these quantifiers prohibit group-level predicates and collective readings. Quantifiers that do not require one at LF are themselves down-stepping functions (the output of which is bound by a higher, null determiner with definite or indefinite semantics). I further show that the overall syntactico-semantic structure of quantification that emerges from (1) and (3) promises to shed new light on several long-standing puzzles in quantification, such as the referential indefinite interpretation and quantifier scope.