

## On Counting Situations: the Mass-Count Distinction in the Domain of Situations

This paper is an extension of Rothstein's (1999) analysis of 'be + AP' where AP denotes a set of mass-eventualities and the function of *be* is to introduce count-eventualities by instantiating the set denoted by AP (i.e., packaging function) and argues that it is a general property of VPs that denote sets of count-eventualities that instantiate sets of mass-eventualities. To do so, I show that the Larsonian VP shell is semantically partitioned into mass and count domains where the denotation of the lower VP is found in the mass domain and the higher VP is interpreted in the count domain. This way of partitioning is evidenced from Bowers' (1993/2001) observation that manner adverbs such as *slowly* can modify higher VPs whereas result adverbs such as *perfectly* cannot: they can only modify lower VPs as follows (the examples are from Bowers (2001):

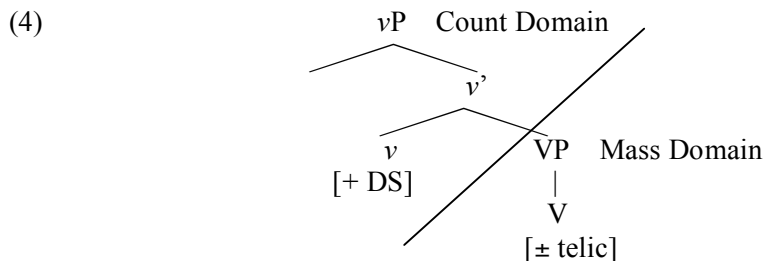
- (1) a. Bill (\*poorly/slowly) recited his lines (poorly/slowly).  
 b. John (\*perfectly/immediately) learned French (perfectly/immediately).  
 (2) a. John immediately learned French perfectly.  
 b. \*John perfectly learned French immediately.

The contrast in modifiability between these two types of adverbs is attributed to the difference in the nature of these adverbs, namely that result adverbs are modifiers of mass-eventualities whereas manner adverbs are not as the following examples illustrate:

- (3) a. Mary made her son (perfectly) polite.  
 b. Mary made his son (\*quickly) quiet.  
 c. Mary made his son quickly be quiet.

Following Rothstein's (1999) analysis of AP whose denotation is found in the mass domain, what the contrast between (3a) and (3b) shows is that although result adverbs such as *perfectly* can modify APs directly indicating that these adverbs can restrict mass-eventualities, manner adverbs requires count-eventualities (cf. (3c)).

Based on the above discussion, I propose that VPs are generally structured in such a way that the lower VP denotes a set of mass-eventualities and that the function of the higher V, represented as *v* in (4), is to introduce count-eventualities by instantiating the set of mass-eventualities denoted by the lower VP:



In (4), *v* carries a feature [+DS] and functions as a domain shifter from mass to count domains, which is essentially the function that Rothstein (1999) assigned to the copula *be*. The set of mass-eventualities denoted by VP in (4) is contingent on what aspectual class it belongs to. For this, I propose that the four Vendlerian aspectual classes of verbs (states, activities, achievement and accomplishments) are definable in terms of functions that instantiate sets of mass-eventualities. In particular, I propose the four Vendlerian VP denotations as in (5):

- (5) a. State:  $\|VP_{love}\| = \lambda s_m.(\text{PRE}(\text{BECOME}(\neg\text{IN-LOVE-WITH}))) (x_{1\dots n}, s_m)$

- b. Activity:  $\|VP_{run}\| = \lambda_{s_m}.(TRN(RUN))(x_{1\dots n}, s_m)$
- c. Achievement:  $\|VP_{arrive}\| = \lambda_{s_m}.(RES(ARRIVE))(x_{1\dots n}, s_m)$
- d. Accomplishment:  $\|VP_{eat}\| = \lambda_{s_m}.(RES(DO(TRN(EAT))))(x_{1\dots n}, s_m)$

In (5), state VPs such as *love* denote pre-states of becoming *x* not in love with *y*; activity VPs such as *run* denote transition states from one stage to another that constitutes the concept of running; achievement VPs such as *arrive* denote result-states obtained when *x* arrives at *y*; and accomplishment VPs such as *eat* denote a combination of result and transition states mediated by Dowty's (1979) *DO*-operator, namely the result states obtained by the completion of an activity of eating. When *v* combines with the respective VPs, it instantiates a set of mass- eventualities denoted by the respective VPs.

The existence of these three types of states is evidenced from the following example:

- (6) The white paper gradually became red.

A state of the paper being white constitutes the pre-state, a state of the paper being red constitutes the result-state, and a state of the paper being neither white nor red constitutes the transition state. Among the three states, the transition state is a complex one. It constitutes a maximal collection of stages between the onset and coda of the process involved.

The problems of counting atelic or imperfective situations first noted by Fintel (1995) and further discussed in Kratzer (2007) find a solution in the present analysis. The following examples are from Kratzer (2007):

- (7)
- a. Whenever a man rides a donkey, the man gives a treat to the donkey.
  - b. When snow falls around here, it takes ten volunteers to remove it.
  - c. When a cat eats more than one can of Super Supper in a day, it gets sick.
  - d. Whenever there are between 20 and 2000 guests at a wedding, a single waiter can serve them.

Assuming that the quantification involved in (7) is over sets of minimal situations (Berman 1987; Heim 1990; Fintel 1995), these examples are problematic in that if we simply take minimal situations, (i) it does not guarantee a complete donkey ride in (7a) or snowfall in (7b); (ii) just a little more than one can of Super Supper would be good enough to make the cat sick in (7c) and 20 guests would be good enough for a single waiter to serve at a wedding in (7d).

In the present analysis, the atelic predicates involved in (7a-b) receive completed event readings in the following way. These sentences entails that there is a set of minimal situations that instantiate a set of the respective mass-situations. Given that transition states are maximal collections of stages, the existence of such minimal situations implies that there is a complete event denoted by the respective predicates. This is what we expect for these sentences.

The present analysis also assigns correct interpretations for the examples in (7c-d). Given that the numeral quantifiers in these examples can only be interpreted in the scope of the respective universal quantifiers as the examples in (8) illustrates, these quantifiers do not undergo Quantifier Raising and as such are interpreted in situ:

- (8)
- a. Every cat ate more than one can of Super Supper.
  - b. Every waiter served between 20 and 2000 guests at the reception.

The upshot of this is that these numeral quantifiers are interpreted in conjunction with the set of the respective mass-situations. This means that the instantiation of the set of mass-situations guarantees that the set of minimal situations properly contains the pragmatically determined numbers of cans per cat in (7c) and guests per waiter in (7d).

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