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The polysemy of measurement☆

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Abstract

The first goal of this paper is to argue that a number of independently treated phenomena – the 'measure' interpretation of pseudopartitives (Landman, 2004), amount relatives (Heim, 1987; Grosu and Landman, 1998), the *how many* ambiguity – are different instantiations of the same phenomenon, the general ability for DPs to denote an individual or a degree corresponding to the measure of that individual. I refer to this as 'individual/degree polysemy'. I show that a particular semantic restriction on the degree interpretations of DPs indicates that the degree interpretation is derived from the individual interpretation (not vice-versa). And I argue that this pervasive polysemy is a natural consequence of degree semantic theories that postulate a null measure operator to measure, when appropriate, individuals, events or degrees. The second goal of this paper is to tie the behavior of this null measurement operator to the similar behavior of quantity adjectives like *many* and *much*, giving further support to the claim that quantity adjectives measure sets of degrees (Rett, 2007, 2008).

Keywords: Polysemy; Degree semantics; Monotonicity; Pseudopartitives; Quantity adjectives; Amount relatives

1. Introduction

The idea that some DPs can denote degrees instead of individuals is a familiar one. Landman (2004) and Rothstein (2009) observe that pseudopartitives can come to denote a measure instead of an individual with a particular measure, and Heim (1987) and Grosu and Landman (1998) observe that a particular sort of relative clause ('amount relatives') can do the same. The broader empirical goal of this paper is to argue that these prima facie independent phenomena are in fact different manifestations of a general individual/degree polysemy, illustrated in (1) and (2).

(1) a. Four pizzas are vegetarian. *individual*
b. Four pizzas is more than we need. *degree*

(2) a. Many guests are drunk. *individual*
b. Many guests is several more than Bill anticipated. *degree*

I will give evidence for this claim, and discuss its connection to previous work, in section 2. In section 3, I'll argue that the ability of DPs to denote degrees is semantically constrained in a particular way: the relevant dimension of measurement must be monotonic on the part-whole structure of the individual, a restriction independently observed in pseudopartitives (Schwarzschild, 2006b).

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The goal of the analysis in section 4 is to provide a semantics of how DPs come to denote degrees, and to explain why these interpretations are subject to a monotonicity restriction. Schwarzschild (2006b) attributed monotonicity in pseudopartitives to a syntactic linking rule; I instead argue that individual/degree polysemy – and the monotonicity restriction – is a natural consequence of the way measurement is treated in natural language. The thesis, developed from the proposal of measurement in Cresswell, 1976, is that natural language employs a null measurement operator, or something equivalent, that can optionally map an entity to its measure provided that the two are related in an informative way. I highlight parallels with the phenomenon of deferred reference, which is similarly restricted in terms of informativity.

The analysis has clear consequences for theories of polysemy as well as degree-semantic theories of measurement. In section 5 I argue that it also provides interesting support for the characterization of quantity adjectives like *many* and *much* as overt instantiations of this measurement operator, in particular as degree modifiers, denoting a relation between a set of degrees and its measure (Rett, 2007, 2008). The result is a relatively uniform degree-semantic treatment of a variety of apparently diverse constructions that involve measurement, including pseudopartitives, relative clauses, constructions with *many* and *much*, and the data in (1) and (2).

2. The degree interpretations of DPs

I'll begin by motivating my claim that this individual/degree polysemy is pervasive.

2.1. Previous discussion of individual/degree polysemy

A word or phrase is polysemous if it receives two or more interpretations that are related to one another in a systematic way (Apresjan, 1974; Pelletier, 1975; Krifka, 1998). (3) and (4) illustrate two canonical types of polysemy.

(3) a. **The window** is cracked. *figure*
b. Mary crawled through **the window.** *ground*

(4) a. John smashed **the bottle of wine.** *container*
b. John drank **the bottle of wine.** *substance*

In (3), *the window* can denote either a pane of glass (the figure) or the frame around the window or where the window generally is (the ground). In (4) the DP *the bottle of wine* exhibits 'container polysemy': it can denote a container or the substance it contains. I'll refer to these DPs as pseudopartitives; they're formed with a measure noun ('MN,' e.g. *bottle*) and the partitive morpheme (*of*). (Partitives are like pseudopartitives except in partitives, the second DP is definite, e.g. *bottle of the wine*.)

The two distinct readings are generally diagnosed by the selectional restrictions of the relevant predicates: panes of glass (but not open spaces) can be cracked while open spaces (but not panes of glass) can be crawled through. And so forth for wine and bottles of it. Depending on the language and the type of entities denoted, polysemy can also be detected via agreement, as Stavrou (2003) has shown for Greek.

(5) a. Iparhun /iparhi mis **sira** **diavathmisis**.
is-3PL .is-3SG a range-SG gradations-PL
'There is/are a range of gradations.'
b. **Ena buketo luludja** itan pesmen-o/ -a sto patoma.
a bunch flowers PST is-3SG /is-3PL thrown on.the.floor
'A bunch of flowers was/were thrown on the floor.'

Depending on the number agreement of the predicate, Stavrou argues, the DP in (5a) can denote either a (single) range of gradations or the plurality of gradations composing that range; and the DP in (5b) can denote either a (single) bunch of flowers or the flowers themselves.

However, some predicates can occur with either polysemous interpretation, making the conditioning of polysemous phrases seem more contextually influenced. (6) is an example of this with standard (individual/individual) polysemy, and (7) is an example with individual/degree polysemy.

(6) John likes **that bottle of wine**. *container/substance*

(7) John ordered **three pizzas**. *individual/amount*

It's this apparent influence of context that led Nunberg (1979, 1995) to argue that polysemy is a pragmatic, rather than semantic, phenomenon (likening it to metaphorical word use). Nunberg suggests that a DP is semantically associated