

Interpretation as Optimization: Constitutive material adjectives

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Abstract

Constitutive material adjectives, a subset of the privative adjectives, include adjectives like *stone*, *wooden*, *plastic*, *foam*, *velveteen*, etc. Constitutive material adjectives exhibit two important features: (1) they appear to violate the Head-Primacy Principle (Kamp and Partee, 1995), (2) their behavior, and thus classification, depends on the constituent with which they combine. Partee (2010) has suggested that these adjectives are not, in fact, privative, but rather are subsecutive adjectives that have undergone coercion. This is a compelling analysis, but unfortunately the mechanisms that underlie the coercion operation have not been fully explored. Here, I argue that coercion, as formulated by Partee, can be understood as the result of optimization over conflicting constraints on interpretation. I propose an analysis that conceives of the meaning of adjectives and nouns as collections of constraints on interpretation. Conceived as such, we can derive the effects of coercion using Optimality Theory (Prince and Smolensky, 2004; Smolensky and Legendre, 2006). © 2014 Elsevier B.V. All rights reserved.

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1. Introduction

Constitutive material adjectives pose several compositional puzzles (Kamp and Partee, 1995; St. Dizier, 1998; Coulson, 2001; Kluck, 2007; Partee, 2010). One such puzzle is that constitutive material adjectives are subject to coercion, which in this context, we may take to be the process of changing the denotation of a particular lexical item as the result of a violation of the Non-Vacuity Principle (Kamp and Partee, 1995; Partee, 2010). For constitutive material adjectives (e.g. *stone lion*, *wooden horse*, *plastic cheeseburger*) it has been suggested that the meaning of the noun is coerced, resulting in a new denotation that picks out a class of entities that are representations of the entities in the extension of the uncoerced noun. For example, when a speaker goes to interpret *stone lion*, they must coerce the meaning of *lion* to *representation of a lion*. After coercion, the construction is interpreted in an essentially intersective fashion (i.e. taking the intersection of the extension of *representation of a lion* and *stone*). In this paper, I attempt to develop a more explicit account of the coercion mechanism as it applies to constitutive material adjectives. To this end, the proposed analysis has three goals that relate to the compositional puzzles posed by constitutive material adjective constructions. First, the proposal should explain the duality of constitutive material adjectives. That is, why do constitutive material adjectives behave intersectively in some contexts, but privatively in other contexts. Second, the proposal should address the apparent inconsistent application of the Head Primacy Principle (Kamp and Partee, 1995). Why is the noun/head in these constructions coerced rather than the adjective/modifier

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(in violation of the Head Primacy Principle)? Finally, the proposal should articulate a possible implementation of the coercion process that causes a shift in the meaning of the noun (Partee, 2010).

In contrast to traditional analyses in semantics (Montague and Thomason, 1974; Parsons, 1970), my account follows a tradition of analyses that deploy Optimality Theory (Blutner, 2000; Zeevat, 2000; Zwarts, 2004; Hendriks and de Hoop, 2001; Blutner et al., 2004; Bouma et al., 2007; Blutner and Zeevat, 2009), the framework that is developed takes interpretation to be the result of an optimization process. In my account, nouns and adjectives are assumed to contribute collections of constraints on interpretation. Interpretation of a composite structure involves optimization over the constraints imposed by each of the constituents (i.e. finding the interpretation that best satisfies the constraints). To address the goals laid out above, I make several proposals. I argue that the duality of constitutive material adjectives is a function of the involved constraints. If the constraints are consistent, the construction will behave intersectively. If the constraints are inconsistent, the construction will behave privatively. I argue that the Head Primacy Principle requires revision. The Head Primacy Principle ought to be conceived as meta-constraint. More specifically, I formulate the Head Primacy Principle as a meta-constraint that is dominated by the Principle of Full Interpretation. Finally, I suggest that coercion, in the sense explored here, is not the result of an independent function in the grammar. Rather, it is the result of optimization over potentially conflicting constraints on interpretation.

Adjectives can be classified on the basis of how their behavior affects the interpretation of the structures in which they participate. The simplest class of adjectives are the intersective adjectives (e.g. *red*, *carnivorous*, *American*). This class of adjectives may be interpreted in accordance with the Intersection Hypothesis (Kamp, 1975; Kamp and Partee, 1995), which suggests that the interpretation of a composite structure involving an intersective adjective is just the intersection of the extensions of the involved constituents. Non-intersective adjectives are those that fail to conform to this hypothesis. Adjectives in the latter class are further classified as either subsective or non-subsective. Composite structures involving subsective adjectives (e.g. *tall*, *fast*, *skillful*) have interpretations (i.e. extensions) that are a subset of the extension of the noun, whereas composite structures involving non-subsective adjectives (e.g. *former*, *alleged*) have interpretations that are not necessarily a subset of the extension of the noun. Finally, composite structures involving privative adjectives (e.g. *fake*, *counterfeit*),¹ which are subsumed by the non-subsective adjectives, have interpretations that are not in the extension of the noun. Constitutive material adjectives, in some constructions, are privative. However, in other constructions, constitutive material adjectives behave intersectively.

In what follows, I begin by giving an assessment of the data to be addressed. Second, I give a brief introduction to Optimality Theory in the context of semantics and consider two previous proposals that use optimization in their account of constitutive material adjectives. Third, I develop the formalism that will be deployed in the analysis. After developing the framework, I offer an account of intersective adjective constructions. While not the primary focus, the analysis will illustrate the fundamental mechanics of the proposed framework. I then offer an analysis of constitutive material adjectives. I conclude with summaries of how Interpretation as Optimization addresses the goals developed above.

2. Constitutive material adjectives

Constitutive material adjectives (e.g. *stone*, *wooden*, *plastic*, *velveteen*) are (sometimes) privative. In contrast to intersective adjective constructions (e.g. *carnivorous mammal*), privative adjective constructions result in an interpretation that consists of a class of entities that are not in the positive extension of the noun.² For example, consider the following sentences and their respective truth-judgments.

- (1) A stone lion is a lion. (False)
- (2) A stone lion is not a lion. (True)

In these sentences, *stone* is behaving privatively. This means that it is conforming to the following meaning postulate.

- (3) Meaning postulate for privative adjectives (Partee, 2010):

$$\Box \forall Q_{\langle s, \langle e, t \rangle \rangle} \forall x_e [ADJ'(Q)(x) \rightarrow \neg [\forall Q(x)]]$$

¹ This is not, strictly speaking true. For example, a counterfeit painting can still be a painting.

² The notion of “adjective” here is somewhat of a misnomer. For example, *stone* is, arguably, a noun acting as a modifier. In addition, “intersective adjective” is also somewhat misleading. Intersectivity is more about the interaction between a noun/head and adjective/modifier than it is about specific adjectives/modifiers. When I use the term “intersective adjective” or “constitutive material adjective”, I really mean “intersective modifier construction” or “constitutive material modifier construction”, respectively. As a result of commitments already made in the literature, I will use the term “adjective”, even though it is probably better characterized as a modifier.

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