

# Types, meanings and coercions in lexical semantics

Nicholas Asher\*

CNRS, IRIT, Toulouse, France

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## Abstract

This paper investigates two types of meaning shift in composition. The first examines the well-known shifts in meaning in predications, known as coercions, that involve aspectual verbs like *start*, *begin* or *finish* or a verb like *enjoy* in combination with non-event denoting direct object arguments. The second involves the modifications of meaning that result from the application of an adjective meaning to a common noun meaning, where the term coercion applies only to some of the shifts observed. Building on the framework and results of Asher (2011) and Asher and Luo (2012), my aim is to get a clearer picture of the different sorts of meaning shifts, what is responsible for meaning shifts and exactly how they affect content.

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## 1. Introduction

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What are coercions? Originally developed for use in simply typed programming languages (see, for example, Mitchell, 1983), coercions have been widely employed in linguistic semantics (Partee and Rooth, 1983; Pustejovsky, 1995; Pulman, 1997). Very roughly, a coercion is a function from one semantic value or one type to another that is employed when some problem arises in the construction of meaning. However, much of the linguistic literature on the subject has failed to provide a framework for analyzing coercions that is either formally or empirically adequate (including, for example, Pustejovsky, 1995), for reasons I rehearse in the next section.<sup>1</sup> I then present a simplified account of coercions from the Type Composition Logic of Asher (2011) with a brief critical discussion of an alternative provided in Modern Type Theory (Luo, 2010, 2011, 2012) and an improved treatment of some puzzling data in Asher and Luo (2012). In the final part of the paper, I turn to adjective noun composition and argue that the mechanisms of meaning shift are similar but different from those used for familiar coercions.

\* Tel.: +33 561557705.

E-mail address: [asher@irit.fr](mailto:asher@irit.fr).

<sup>1</sup> See also Asher (2011), sections 2 and 3, for many more details.

## 2. Verbal coercions

### 2.1. The linguistic form of coercions

Coercions take place against a background of a theory of lexical meaning and meaning composition that takes selectional restrictions seriously. Normally a predication involving a predicate whose arguments do not meet its standard selectional restrictions will not result in a felicitous meaning. However, with *coercion* a predicate whose standard selectional restrictions are not met by its argument may still convey a coherent linguistic meaning because either one of the terms or the predication relation between predicate and argument is adjusted in some way so that the composition process may succeed.

In this paper, I am interested in coercions that involve incompatibilities between so called “simple” or “basic” types. What are simple types? Linguists working on word meaning developed a rich and complex typology of different sorts of entities that could affect semantic composition. Predicates come with *sortal restrictions* on their arguments; and if arguments meet those restrictions, then the predication is semantically felicitous. If they do not, then often the predications fail, as in (1):

- (1) A prime number is soft.

The predicate *is soft* cannot felicitously apply to its argument *a prime number*, unless one of the terms is redefined or acquires a very idiosyncratic meaning in context. A natural explanatory hypothesis for the behavior of selectional restrictions is that selectional restrictions are *type restrictions*; the type of entity that satisfies the predicate *is soft* is a subtype of the type of entities that formal semanticists use (the type  $\epsilon$ ), and this subtype is incompatible with the type assigned to numbers.<sup>2</sup> Work in mathematical foundations and computer science uses strongly typed languages and a system of type checking or consistent type assignments to terms to assess the well-formedness of formulas or programs. Asher (2011) uses these tools in an analysis of semantic well-formedness, selectional restrictions and coercion, which I will follow here.

Let’s begin with what seems to be a very productive sort of coercion. In the following examples, we see two types of entities that a single expression may give rise to.

- (2) a. John brought a bottle. It had a nice label/ It was yummy.  
 b. John brought a bottle. It had a nice label and was yummy.  
 c. John touched the bottle, which had been so yummy.

(2a,b) provide two different continuations for the first sentence, each containing pronouns that refer back to two different sorts of objects. If we analyze pronominal reference across sentences using Discourse Representation Theory or some other dynamic semantic formalism, we see something interesting. Depending on the continuation, one could infer that the first sentence of (2) makes available a discourse referent for the bottle or one for its contents that can be linked to the anaphoric pronoun in the continuation; but as (2bc) show, the first sentence makes available discourse referents for *both* the bottle and its contents.

Let’s now examine the examples in (2) from the perspective of selectional restrictions. *Bottle* intuitively types the entities satisfying the predicate as being of a type having to do with containers. Predicates like *have a nice label* apply to physical objects with stable surfaces, *inter alia* containers. So in the first continuation given in (2a), the pronoun picks up the discourse referent of the type CONTAINER. Assuming that anaphoric binding preserves type identity, then the discourse referent introduced by *it* that is the argument of *have a nice label* is of the right type to meet the selectional restrictions of the predicate. However, in the second continuation, the predicate *is yummy* requires its argument to be edible or drinkable, let’s assume. For simplicity, let’s assume that BOTTLE is not in the type system a subtype of comestible foodstuff (though this is a simplification—the bottle might be made of chocolate). In that case, we have a case of coercion: in order for the predication to succeed, the predication must license the introduction of a discourse referent or variable that refers to the contents of the bottle and it is this referent that is the argument of the predicate *is yummy*. This discourse referent with the type CONTENTS satisfies the selectional restrictions of the predicate. Importantly, with this kind of coercion both the “coerced” denotation and the original denotation of the argument seem equally available.

There are other well-known examples of coercion—for example those involving aspectual verbs like *start*, *begin* and *finish*, as well as verbs like *enjoy* in English, where this is not the case. For instance, (3) is equivalent in meaning to (4):

- (3) Julie enjoyed (started/finished) a book.  
 (4) Julie enjoyed doing something with (e.g., reading, writing, ...) a book.

<sup>2</sup> Asher (2011) argues for this thesis in detail.

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