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978-1-107-00539-6 - Lexical Meaning in Context: A Web of Words

Nicholas Asher

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## Lexical Meaning in Context

This is a book about the meanings of words and how they can combine to form larger meaningful units, as well as how they can fail to combine when the amalgamation of a predicate and argument would produce what the philosopher Gilbert Ryle called a “category mistake”. It argues for a theory in which words get assigned both an intension and a type. The book develops a rich system of types and investigates its philosophical and formal implications, for example the abandonment of the classic Church analysis of types that has been used by linguists since Montague. The author integrates fascinating and puzzling observations about lexical meaning into a compositional semantic framework. Adjustments in types are a feature of the compositional process and account for various phenomena including coercion and copredication. This book will be of interest to semanticists, philosophers, logicians, and computer scientists alike.

NICHOLAS ASHER is Directeur de Recherche CNRS, Institut de Recherche en Informatique de Toulouse, Université Paul Sabatier, and Professor of Philosophy and of Linguistics at the University of Texas at Austin. He is author of *Reference to Abstract Objects in Discourse* (1993) and co-author of *Logics of Conversation* (2003) with Alex Lascarides.

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## Preface

Just over fifty years ago with the publication of “Two Dogmas of Empiricism”, W. V. O. Quine launched a persuasive and devastating attack on the common sense notion of word meaning and synonymy, according to which two terms were synonymous just in case they had the same meaning. Quine’s legacy continues to hold sway among much of the philosophical community today. The theory of word meaning is often thought either not to have a subject matter or to be trivial—*dog* means dog. What else is there to say? Well, it turns out, quite a lot. Linguists like Charles Fillmore, Igor Mel’cuk, Maurice Gross, Beth Levin, Ray Jackendoff, James Pustejovsky, and Len Talmy—to mention just a few, as well as researchers in AI who have built various on-line lexical resources like WORDNET and FRAMENET, have provided rich and suggestive descriptions of semantic relations between words that affect their behavior. And this has led to several proposals for a theory of word meaning.

Against this rich descriptive background, however, problems have emerged that make it not obvious how to proceed with the formalization of lexical meaning. In particular, something that is commonly acknowledged but rarely understood is that when word meanings are combined, the meaning of the result can differ from what standard compositional semantics has led us to expect: in applying, for instance, a property term ordinarily denoting a property  $P$  to an object term ordinarily denoting  $a$ , the content of the result sometimes involves a different but related property  $P'$  applied to an object  $b$  that is related to but distinct from the original denotation of  $a$ . While the choice of words obviously affects the content of a predication, the discourse context in which the predication occurs also affects it. The trick is to untangle from this flux a theory of the interactions of discourse, predication, and lexical content. That is what this book is about.<sup>1</sup>

<sup>1</sup> I owe many people thanks for help with this book: Alexandra Aramis, Alexis, Elizabeth, and Sheila Asher, Tijana Asic, Christian Bassac, David Beaver, Stephano Borgo, George

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In this book, I argue that the proper way to understand the meaning of words is in terms of their denotations *and* the restrictions that other words impose on them. And it is the latter that govern how words interact semantically. I begin with the widely accepted observation according to which a predication will succeed only if the selectional restrictions the predicate imposes on its arguments are met. I provide an analysis of selectional restrictions by assigning words types. Meeting a selectional restriction is a matter of justifying a lexical presupposition, the presupposition that a term has a certain type. This analysis yields a theory of lexical meaning: to specify the type and the denotation of a word is to give its lexical meaning. The mechanisms of presupposition justification developed in dynamic semantics in recent years lead to an account of how predication adds content to the “ordinary” contents of the terms involved, which will provide my account of meaning shifting in context. The theory I will develop in this book has implications for compositional semantics, for example for the architecture of verbal and nominal modification. It also unifies analyses in compositional semantics of presuppositions with my analysis of type presuppositions; for instance, the presuppositions of factive verbs or definite noun phrases are just special cases of type presuppositions.

The idea that there are non-trivial semantic interactions between words that affect the content of a predication is intuitive and perhaps obvious. But working out a precise theory, or even an imprecise one, of this phenomenon is difficult. I begin with some basic questions, distinctions, and observations.

What is a word? In some sense the answer is obvious: words are the things dictionaries try to define. On the other hand, the answer is not so simple. Words in many languages come with inflection for case, for number, for gender, among other things. Furthermore, there are morphological affixes that can transform one word into another like the nominalization affixes in English: an

Bronnikov, Robin Cooper, Denis Delfitto, Pascal Denis, Tim Fernando, Pierdaniele Giaretta, John Hawthorne, Mark Johnson, Hans Kamp, Chris Kennedy, Ofra Magidor, Alda Mari, Claudio Masolo, Bruno Mery, Friedericke Moltmann, Philippe Muller, David Nicolas, Barbara Partee, Sylvain Pogodalla, François Recanati, Christian Retoret, Antje Rossdeutscher, Sylvain Salvati, Magdalena Schwager, Stuart Schieber, Torgrim Solstad, Tony Veale, Laure Vieu, Kiki Wang, Laura Whitten, and participants of the seminars on lexical semantics at the University of Verona, the University of Texas at Austin, the University of Stuttgart, and the Summer Institute of the Linguistic Society of America at Stanford, where some of this material was presented. I want especially to thank Hans Kamp and members of the SFB 732 at the University of Stuttgart for their generous invitation to spend three months there to work on this project during the summer of 2008. Special thanks are also due to Julie Hunter and Renaud Marlet who reread much of the manuscript and offered many helpful comments and to James Pustejovsky, who got me to work on the subject of coercion and dot objects in the first place. Finally, I'd like to thank Andrew Winnard, Sarah Green, Gillian Dadd, Alison Mander, and Elizabeth Davey from Cambridge University Press for their help with the manuscript. The book is dedicated to Tasha, my darling little cat who didn't manage to live to see the end of this project.

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affix like *-ion* turns a verb like *afflict* into the noun *affliction*. Morphological affixes and prefixes can often affect the meaning of a word; they can also determine how their host words combine with other words, as we shall see later on in this book. Even inflections like the plural are not always semantically innocent. Thus, the notion of a word quickly becomes a theoretical term; the meaningful parts of the lexicon may include things that we ordinarily would think of as bits of words, and basic word stems (the elements to which affixes and prefixes attach) may not end up looking like ordinary words at all.

Despite these complications, I will continue to speak (loosely) of words. What is it to give the meaning of a word? There are a number of answers in the literature on lexical semantics or theories of word meaning. Cognitive semanticists like Len Talmy and Tom Givon, among others, think that meanings are to be given via a set of cognitively primitive features—which might be pictorial rather than symbolic. According to these semanticists, a lexical theory should provide appropriate cognitive features and lexical entries defined in terms of them. Others in a more logical and formal framework like Dowty (1979) (but also Ray Jackendoff, Roger Shank, and other researchers in AI) take a specification of lexical meaning to be given in terms of a set of primitives whose meanings can be axiomatized or computationally implemented. Still others take a “direct” or denotational view; the function of a lexical semantics is to specify the denotation of the various terms, typically to be modelled within some model theoretic framework.

All of these approaches agree that a specification of lexical meaning consists in the specification of some element, whether representational or not, formal or not, that, when combined with elements associated with other words in a well formed sentence, yields a meaning for a sentence in a particular discourse context. Whatever theoretical reconstruction of meaning one chooses, however, it should be capable of modelling inferences in a precise manner so that the theory of lexical meaning proposed can be judged on its predictions. In addition, the theoretical reconstruction should provide predictions about when sentences that are capable of having a truth value are true and when they are not. This drastically reduces the options for specifying lexical meaning: such a specification must conform with one of the several ways of elaborating meaning within the domain of formal semantics; it must specify truth conditions, dynamic update conditions of the sort familiar from dynamic semantics (Kamp and Reyle (1993), Groenendijk and Stokhof (1991), Asher (1993), Veltman (1996)), or perhaps provability conditions of the sort advocated by Martin-Löf (1980) and Ranta (2004), among others.

For proponents of a direct interpretation of English, a denotational approach to lexical meaning suffices. Most semanticists, however, use a logical language

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to state the meanings of natural language expressions. The logical representations of sentential meanings are typically called *logical forms*. Within such a framework a lexical entry for a word should specify a logical representation that when combined together with the contributions of other words in a well-formed sentence will yield a logical form with well-defined contents. I shall follow formal semantic tradition and use a logical language with a well-defined model theoretic interpretation to provide as well as to construct logical forms.<sup>2</sup>

Thus, at a minimum, lexical semantics should be concerned with the lexical resources used to construct logical forms in a language with a precise model theoretic interpretation. But what are those resources? Clearly the syntactic structure of a clause is necessary for constructing a logical form for the clause, but that is not the province of lexical semantics. One that is, however, is argument structure. Most words—verbs, adjectives, nouns, determiners, and adverbs—have arguments, other words or groups of words, that they combine with; and the meaning of such words must specify what other kinds of words or groups of words they can combine with to provide larger units of meaning. But an account of lexical meaning must do more than this; it must also specify what the process of combination is when the representation of one word meaning combines with other word meaning representations licensed by their argument structures. It must couple its representation of a word's meaning with a mechanism for combining this representation with the representations of the meanings of its arguments or of the words to which it is an argument. The construction of logical form and the lexical resources used to construct it thus inevitably involve the notion of predication; when one bit of logical form functions as an argument to another, a predication relation holds between a property denoting term and its argument. A satisfactory theory of lexical meaning must yield an account of predication, and the choice of a model of predication affects the choice of how to represent lexical meanings. I turn now to a basic formal model of predication and the representation of lexical meaning.

<sup>2</sup> Cognitive semantics lexical theories will not figure in this book, because they do not really have the resources to provide logical forms for sentences capable of defining truth conditions or update conditions. Gärdenfors (1988) has provided a formal model of the cognitive semantics view of lexical meaning by taking the cognitive features to form the basis of a vector space. Lexical meanings are then represented as vectors or sets of vectors in this space. Such a theory can give us a potentially interesting measure of similarity in meaning by appealing to distances between points in this feature space. Certain lexical inferences can also be accounted for as Gärdenfors (1988) shows. But the compositional problem, that is, the problem of showing how these meanings compose together to get meanings of larger units, is unsolved, and it is not at all obvious how one could solve it within the vector or feature space framework for anything more than the simplest of fragments of natural language.