Definitions as Theories of Word Meaning

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Accepted May 10, 1990

Dictionary definitions are often used in education and in computerized databases for processing natural language, but their accuracy as models of word meaning has not been carefully evaluated. An experiment involving fourth graders and adults measured the efficacy of dictionary definitions in marking distinctions in sense and found them to be very poor for children, but fairly helpful for adults. A second experiment compared dictionary definitions to definitions written by college students who had sorted sets of sentence citations, and found both moderately effective in teaching word use. Good definitions were produced less often for high-frequency words than for low-frequency words, given equivalent numbers of citations, suggesting that sentences using high-frequency words are less informative overall. Also, the more citations available to the definition writer, the better the definition was in teaching word use, suggesting that information about word meaning is cumulative and describable.

Dictionaries have been called a “semantic bottleneck” (Edwards, 1983). Lexicographers typically try to describe, in a brief and parsimonious way, all possible meanings a word may have in its contexts of use. They do this by introspectively consulting their own linguistic knowledge, but they base this thinking on observation of the actual uses of each word they are seeking to define. So, for instance, a historical dictionary like the Oxford English Dictionary (1989) may be based on the sampling of as wide a range of diachronic word usage as possible, while an ordinary desk dictionary may be intended to describe only synchronic meaning, so words are sampled in a range of their present usage.

1 This research was partially supported by grants from the Spencer and Sloan Foundations to George A. Miller. Correspondence should be addressed to the author at Teachers College, Columbia University, 525 West 120 Street, New York, New York 10027.
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A definition, then, is a theory about the semantic relations that hold between the sentences that contain a particular word. As such, it may be considered a source of information for psychologists and others who seek to understand the mental representation of word meaning. Dictionaries are increasingly used as semantic databases in artificially intelligent programs to process natural language (Byrd et al., 1987). In addition, dictionary definitions have long been considered tools for teaching word meaning to those new to the language, such as children and foreigners.

Whether dictionary definitions give accurate and informative pictures of word meanings has not been carefully evaluated. Some philosophers have optimistically suggested that they do (Edwards, 1983; Putnam, 1975; Quine, 1960). However, some psychologists have discovered that, at least for children, dictionary definitions are not informative or are downright misleading (Deese, 1967; Gildea, Miller, & Wurtenberg, 1988). Certainly there are reasons to think that capturing word meaning in a definition may be quite difficult, if not impossible. First, Johnson-Laird (1987) and Miller (1981) argue, in accord with suggestions by Erikson and Simon (1980) and Pylyshyn (1980), that the mental lexicon is cognitively impenetrable or opaque to introspection. If this is so, neither a lexicographer in a definition nor a psychologist in a theory about word meaning can be expected to accurately portray the content and structure of the information our minds use to comprehend words and disambiguate sentences. As Johnson-Laird suggests, if we could inspect our mental representations directly, we would not need theories about them. However, Johnson-Laird and Quinn (1976) seem to feel that the problem of opacity is limited to what they call semantic primitives, which may be labeled but not defined or taken apart, much like “atoms.” They suggest that words with meanings which combine primitives will be definable because they may be taken apart, like “molecules.”

A second and related difficulty in writing accurate and informative definitions is the fact that a definition must be a parsimonious representation, but the nature of the parsimony which must inhere in the mental representation of word meaning is very poorly understood. Another way of formulating this difficulty is to ask what sort of principle one would need to distinguish definitional information from encyclopedic information about the world. There is no reason to think that lexicographers have any secret insight into this issue. Psychologists, linguists, and workers in artificial intelligence have struggled unsuccessfully to describe semantic parsimony theoretically (e.g., Collins & Quillian, 1969; Katz & Fodor, 1963; Weinreich, 1980) or in practice (Kelly & Stone, 1975; Sowa, 1984).