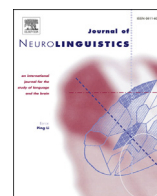




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# Inferential and referential lexical semantic competence: A critical review of the supporting evidence

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## ABSTRACT

In philosophical semantics, a distinction has been proposed between inferential and referential lexical semantic competence. The former accounts for the relationship of words to the world, the latter for the relationship of words among themselves. Recent neuroscience research suggests that the distinction might be actually neurally implemented. That is, that inferential and referential abilities might be underpinned by two functionally independent cognitive architectures, with partly different neural realizations. This hypothesis is consistent with brain patient data, supporting the notion of a functional double dissociation between inferential and referential abilities, and with neuroscience data, suggesting that inferential and referential abilities are underpinned by at least partly different regions of the human brain. The principal aim of this article is to provide the first comprehensive and critical review of the empirical evidence in favour of such hypothesis.

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## 1. Introduction

Lexical competence involves many different kinds of abilities. For instance, it involves the ability to recognize and produce the characteristic sounds of a natural language (*phonological competence*), or the ability to use words according to their formation rules (*morphological competence*), or to their combinational properties (*syntactic competence*). In addition, it involves semantic abilities, i.e. abilities about word meaning (*semantic competence*). In philosophy of language, a distinction has been proposed by Diego Marconi between two aspects of lexical semantic competence, i.e. inferential and referential competence (Marconi, 1997). One aspect of lexical competence, i.e. inferential competence, is the «ability to deal with the network of semantic relations among lexical units, underlying such performances as semantic inference, paraphrase, definition, retrieval of a word from its definition, finding a synonym, and so forth» (Marconi, 1997, p. 59). For instance, we know that a *cat* is an *animal*, we can verbally describe the differences between a *cat* and a *dog*, we can recover the word *cat* from a definition such as *The animal that meows*, and so on. Such “intralinguistic” abilities are semantic because, in order to exercise them, a speaker must possess an internalized network specifying semantic connections between a given word (e.g., *cat*) and other words of a natural language (e.g., *animal*, *meow*).

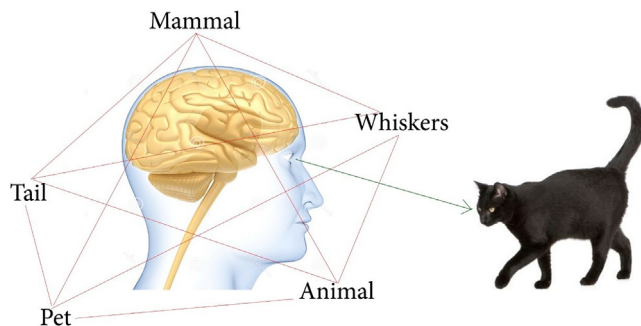
The second aspect of lexical competence, i.e. «referential competence», cognitively mediates the relation between words and entities of the world. For example, we have the ability to classify a given perceived object as a *cat* or to distinguish it from a *dog*, to recognize and name a picture of a cat, and so on. Clearly, we can speak of referential competence only relative to words that refer to objects, properties or events we can perceive (e.g., *cat*, *red*, *hot*). It is plausible to think that the content of referential competence for such words consists in a set of cognitive procedures that systematically relate words to the output of perceptual processes; it is thanks to our perceptual recognition systems, particularly to the visual recognition system, that we can apply words to objects and circumstances in the world (Fig. 1).

Originally, the distinction between inferential and referential competence was proposed by Marconi as a philosophical claim about the descriptive limits of model-theoretic semantics (e.g., Davidson, 1967; Montague & Thomason, 1974). Inferential competence is the aspect of human lexical competence that, in formal semantics, can be modelled by means of so-called meaning postulates (Carnap, 1952). Essentially, meaning postulates are stipulations about the relations between lexical items; more precisely, they are stipulations about the relations between the words’ extensions. For instance, a meaning postulate like:

[MP]  $(\forall x) (cat(x) \rightarrow animal(x))$

stipulates that for every  $x$ , if  $x$  falls within the extension of *cat* then it falls within the extension of *animal*. Such connections are semantic because they involve the intension, not just the extension of words. By contrast, referential competence is problematic for formal, model-theoretic semantics. No set of meaning postulates can capture this aspect of lexical semantic competence: a speaker who knew all meaning postulates for a natural language  $L$  would not thereby know what the sentences of  $L$  are about. For instance, knowing that cats are mammals, that they have four legs, that they usually meow, will not enable us to recognize a cat in the environment – not unless we know how to apply *leg*, *meow*, and many other words. The inferential/referential theory of human lexical competence should be distinguished from “dual” theories of meaning proposed by philosophers such as Block (1986), Loar (1981), McGinn (1982), and others. In such theories, the referential component is conceived externalistically, i.e. as determined by external circumstances, natural and social. Instead, «referential competence totally coincides with the ability a speaker has to relate words to the world thanks to perception and other cognitive faculties» (Marconi et al., 2013, p. 2054).

The distinction between inferential and referential competence appears to capture some intuitively salient aspects of language use. For many words, inferential and referential abilities widely vary from speaker to speaker. For example, «a metallurgist knows more than an ordinary speaker about gold, and she can identify gold in many ways, including by way of



**Fig. 1.** A graphic representation of the inferential (red) and referential (green) lexical semantic competence. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

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