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# Language knowledge and event knowledge in language use



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### ABSTRACT

This paper examines how semantic knowledge is used in language comprehension and in making judgments about events in the world. We contrast knowledge gleaned from prior language experience (“language knowledge”) and knowledge coming from prior experience with the world (“world knowledge”). In two corpus analyses, we show that previous research linking verb aspect and event representations have confounded language and world knowledge. Then, using carefully chosen stimuli that remove this confound, we performed four experiments that manipulated the degree to which language knowledge or world knowledge should be salient and relevant to performing a task, finding in each case that participants use the type of knowledge most appropriate to the task. These results provide evidence for a highly context-sensitive and interactionist perspective on how semantic knowledge is represented and used during language processing.

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## 1. Introduction

One of the primary purposes of language is to communicate about entities and events in the world. Therefore, language use necessarily involves integration of knowledge about linguistic forms and

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knowledge of those forms' real world referents. For example, if a speaker is telling a listener about a squirrel, the listener uses both world knowledge and language knowledge to comprehend the speaker's utterances. Examples of relevant world knowledge include prior encounters with squirrels and direct experience with their characteristic behaviors. An example of language knowledge is phonotactic knowledge about English, such as the fact that the phoneme sequence /skw/ is a rare but permissible sequence in English, and that the sequence is most likely to be at word onset, as in the word *squirrel*. In these examples, the world knowledge (observations of an animal) and language knowledge (experience with the phoneme sequences in the word that names the animal in English) are very easily distinguished. They come from different experiences (have a different ontogenesis) and they are used for different tasks, such as reasoning about squirrels vs. recognizing the word *squirrel* in the speech stream.

In other cases, however, world and language knowledge become easily blurred. For example, perhaps the comprehender brings to bear some information about squirrels that came not from direct experience but from reading or hearing something about squirrels, such as having read, "Squirrels bury nuts in the yard." This information has elements of both world and language knowledge; comprehenders of this sentence receive information about squirrel behavior in the world, but the experience of reading the sentence also provides language knowledge, such as about the co-occurrence of words, as in the trigram *squirrels bury nuts*. This sequential word co-occurrence information, like sequential phoneme information (phonotactics), affects patterns of reading and language comprehension (McDonald & Shillcock, 2003).

This article is aimed at elucidating the relationship between the *ontogenesis* of knowledge and the extent to which world-derived and language-derived knowledge are brought to bear under different task demands. As we've just noted, there are many varieties of world knowledge and language knowledge, but our explorations will focus on particular types. On the world side, we investigate probabilities associated with people's knowledge of events, such as the probability that squirrels bury things, or the probability that a burying event takes place in a yard. On the language side, the knowledge we investigate is knowledge of word co-occurrences, such as the co-occurrence of *squirrel* and *bury* or *bury* and *yard*. These two instantiations do not exhaust either the world or language knowledge that people possess, but they can be aligned in a way that permits useful comparisons. In the next section, we argue for the importance of this world/language knowledge distinction in current theories of language comprehension. We then present four experiments investigating how the balance between us of language (word co-occurrence) knowledge and world (event) knowledge changes as a function of varying task demands.

### 1.1. The growing importance of language knowledge in language comprehension

While researchers have always identified clear cases of language knowledge such as phonotactics, and similarly clear cases of world knowledge, until recently subtle language/world distinctions with respect to semantic knowledge have not been of primary concern to accounts of language comprehension. Modular accounts of language comprehension that were developed in the 1970s were notable in distinguishing stages of processing (Frazier & Fodor, 1978; Swinney, 1979), but these stages did not cleave cleanly along language/world knowledge boundaries. For example, in Frazier's (1987; Frazier & Fodor, 1978) account of sentence interpretation, language-specific syntactic information guided initial parsing via Minimal Attachment and other parsing principles (language knowledge), and a later stage integrated this parse with semantic knowledge, without regard to whether semantic knowledge was world- or language-derived. More recently, constraint-based accounts of language comprehension have argued against distinct stages of processing and emphasized how the rapid use of complex probabilistic semantic information shapes sentence comprehension (MacDonald, Pearlmutter, & Seidenberg, 1994; McRae, Spivey-Knowlton, & Tanenhaus, 1998), again without clear claims about the ontogenesis of the information. For example, constraint-based approaches to language processing that have measured the effect of semantic plausibility on comprehension (as in studies that ask questions such as "How likely is it for a cop to arrest someone?") (Ferretti, McRae, & Hatherell, 2001) appear to be studying the effect of world knowledge on comprehension (e.g., the likelihood of a cop performing an arresting event in the world). However, these real-world probabilities are also reflected in linguistic

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