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# Judging a *book* by its cover and its contents: The representation of polysemous and homophonous meanings in four-year-old children

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### ABSTRACT

Unlike *homophonous* meanings, which are semantically unrelated (e.g., the use of *bat* to refer to a baseball bat and a flying rodent), *polysemous* meanings are systematically related to one another (e.g., the use of *book*, *CD*, and *video* to refer to physical objects, as in ‘the leather book’, or to the intellectual content they contain, as in ‘the profound book’). But do perceived relations among polysemous meanings reflect the presence of generative lexical or conceptual structures that permit the meanings of these words to shift? If so, these structures may also support children’s early representations of polysemous meanings. In four studies, we demonstrate (1) that four-year-old children can understand both the concrete and abstract meanings of words like *book*, (2) that when taught a novel label for one of these meanings, children can readily understand an extension of that label to the other meaning, and (3) that extension does not occur between two homophonous meanings, which share a common phonological form but are otherwise unrelated. We conclude that the polysemous meanings of words like *book* rely on a common representational base early in development, and suggest that this may be the result of foundational, generative properties of the lexicon or conceptual system.

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## 1. Introduction

A quintessential feature of the use of words is that a single phonological form can be associated with multiple meanings. This aspect of word use is the basis for many jokes. Consider the following example: “There was once a cross-eyed teacher who couldn’t control his *pupils*.” Or another: “The Alpine Skiing competition started poorly and went *downhill* from there.” The interpretation of each of these sentences depends greatly on which of the different possible meanings of *pupils* (students in a class; parts of the eye) and *downhill* (physically sloping downward; an abstract worsening of condition) are selected, and the sentences are humorous because they make these different interpretations simultaneously available to the reader or listener.

Although both *pupils* and *downhill* can be exploited to humorous effect, these two cases of ambiguity appear different from one another upon further reflection. In particular, while there is no discernible semantic relationship between the two meanings of *pupils*, the metaphorical relationship between the concrete and abstract meanings of *downhill* is intuitive, and similar relationships can be identified between the concrete and abstract meanings of many other words such as *collapse* (The building *collapsed*/The economy *collapsed*), *rise* (The bird is *rising* above the clouds/Our spirits are *rising*), and so on (Lakoff & Johnson, 1980). Such intuitions regarding the relatedness of a word’s meanings have motivated a distinction between words like *pupil* and *downhill*. While words like *pupil* are categorized as *homophones*—words that have multiple meanings that are semantically unrelated—words like *downhill* are categorized as *polysemous*—words with multiple meanings that are semantically related. This distinction is implicit in the organization of dictionaries: while the different meanings of a homophonous word such as *pupil* are typically listed as separate lexical entries, the different meanings of a polysemous word such as *downhill* are typically grouped together within a single lexical entry. But is a distinction between homophones and polysemous words also expressed psychologically, in how the meanings of these words are represented within the mental lexicon?

Research within psycholinguistics has converged in suggesting that pairs of homophonous meanings are represented as separate words, sharing a common phonological word form but otherwise diverging from one another both lexically and semantically (see e.g., Seidenberg, Tanenhaus, Leiman, & Bienkowski, 1982). However, the representation of polysemous words has remained the subject of debate (see, e.g., Beretta, Fiorentino, & Poeppel, 2005; Frazier & Rayner, 1990; Klein & Murphy, 2001, 2002; Rodd, Gaskell, & Marslen-Wilson, 2002; Williams, 1992; Pyllkanen, Llinas, & Murphy, 2006; Klepousniotou & Baum, 2007; Klepousniotou, Titone, & Romero, 2008). A first possibility is that the presence of systematic relations among polysemous meanings (see Table 1, for a list of some of these relations) reflects that these meanings share not only a common phonological word form, but also a common lexical or conceptual representational base. This is a view held by what we refer to as Generative Models of the lexicon, which claim that polysemy reflects the presence of *generative* structures: lexical or conceptual structures that permit the meanings of known words to shift along polysemous relations and that further allow these relations to generalize to novel words (e.g., Caramazza & Grober, 1976; Copestake & Briscoe, 1995; Lakoff, 1987; Langacker, 1987; Pustejovsky, 1995; Rice, 1992; Tyler & Evans, 2001). However, a second possibility is that the relations we perceive

**Table 1**

A list of some of the relations among polysemous meanings in English.

Relation and participating words	Examples
Animal/Meat ( <i>chicken, fish, lamb</i> , etc.)	The <i>chicken</i> drank some water/The <i>chicken</i> was well-salted
Material/Product ( <i>glass, tin, linen</i> , etc.)	The windows are made with strong <i>glass</i> /He poured water into a <i>glass</i>
Object/Content ( <i>book, video, DVD</i> , etc.)	The <i>book</i> would not fit in her backpack/It is a very persuasive <i>book</i>
Container/Contents ( <i>pot, bottle, glass</i> , etc.)	The <i>pot</i> is chipped around the edges/Make sure to stir the <i>pot</i> .
Space/Time ( <i>long, on, around</i> , etc.)	They sat around the <i>long</i> table/The film is about three hours <i>long</i>
Body Part/Object Part ( <i>leg, arm, back, head</i> , etc.)	Her <i>leg</i> is feeling weak /The chair has a broken <i>leg</i> !
Person/Product ( <i>Dickens, Picasso, Mozart</i> , etc.)	<i>Dickens</i> grew up in London/He put <i>Dickens</i> on the shelf
Place/Institution ( <i>White House, Wall Street</i> , etc.)	The <i>White House</i> is being restored/The <i>White House</i> made a decision
Place/Event ( <i>Vietnam, Woodstock</i> , etc.)	<i>Vietnam</i> is next to Laos/He protested during <i>Vietnam</i>

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