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The relationship between knowing a word and reading it aloud in children's word reading development

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ABSTRACT

This experiment examined the item-level relationship between 7-year-olds' ability to read words aloud and their knowledge of the same words in the oral domain. Two types of knowledge were contrasted: familiarity with the phonological form of the word (lexical phonology), measured by auditory lexical decision, and semantic knowledge, measured by a definitions task. Overall, there was a robust relationship between word knowledge and reading aloud success. The association was stronger when words contained irregular spelling–sound correspondences. There was no evidence that a deeper or more semantic knowledge of words was more closely related to reading aloud success beyond the association between reading success and familiarity with the phonological form of the same words. This finding is not compatible with models that see semantics as contributing directly to the reading aloud process, at least during the relatively early stages of reading development. More critical was whether or not a word was considered a lexical item, as indexed by auditory lexical decision performance.

Introduction

The question of how children learn to read words has generated considerable research interest, resulting in a rich understanding of some aspects of word reading development. Alphabetic decoding—the ability to translate a printed word into its spoken form—clearly plays a pivotal role in early reading development, underpinned by developments in children's phonological skills (e.g., Ehri, 2005; Share, 1995, 2008b). Equally clear, however, is that factors other than alphabetic decoding and phonological skill must also contribute to word reading development, especially as children get

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older and become more skilled at reading (e.g., Castles & Nation, 2006; Scarborough, 2005). One factor that might be important is knowledge about the meanings of words. The lexical quality hypothesis (Perfetti, 2007; Perfetti & Hart, 2002) states that effective reading demands high-quality lexical representations that integrate information about form (phonology, orthography, and grammatical class) and meaning (semantics). This hypothesis remains open to the mechanisms that might underpin how semantic knowledge becomes integrated with form during the development of high-quality representations. Some years ago, Plaut, McClelland, Seidenberg, and Patterson (1996) suggested that semantic factors provide a direct contribution to children's word reading development. Surprisingly, some of the key predictions of their model have not been tested against data from children learning to read. The overall aim of the current investigation was to assess the hypothesis that children's knowledge of word meanings in the oral domain contributes to their ability to read words aloud. We begin by describing Plaut and colleagues' model and reviewing some evidence from children that is broadly consistent with its framework before introducing the specific hypotheses evaluated here.

Plaut and colleagues' (1996) model, the triangle model, is a connectionist one in which lexical information is represented in sets of distributed subsymbolic codes representing lexical attributes (semantic, phonological, and orthographic). Reading aloud follows from the activation of codes from visual input and is accomplished via two pathways working in parallel: a phonological pathway comprising connections between orthography and phonology and a semantic pathway comprising mappings among semantic, phonological, and orthographic representations. Reading aloud is considered to involve both pathways and all types of representation regardless of the lexicality, familiarity, or frequency of the items being read. However, because the phonological pathway is more direct, it is thought to be faster and, therefore, to contribute more to reading aloud than the semantic pathway. Importantly, although the semantic pathway is always active, contributing some information to the reading process, its contribution becomes more important when the phonological pathway is compromised, for example, when reading words that have inconsistent mappings between orthography and phonology. Consistent with this, semantic involvement in reading aloud has been demonstrated most clearly when adults are asked to read inconsistent words (e.g., McKay, Davis, Savage, & Castles, 2008).

Is there any evidence that semantic factors may contribute to children's word reading skill? One perspective on this question is to note that when children come to the task of learning to read, many of the words they encounter in print are familiar in their oral language. Thus, it is reasonable to ask whether this knowledge influences the ease with which children learn to read. Consistent with word knowledge playing a role in reading development, a number of investigators have shown that individual differences in oral vocabulary knowledge are associated with reading skill. For example, Nation and Snowling (2004) found that word knowledge accounted for unique variance in children's word reading measured concurrently at 8 years of age and longitudinally when the children's reading was reassessed 5 years later at 13 years of age, even after variance associated with decoding (nonword reading) and phonological skills was taken into account. If we assume that oral knowledge provides a reasonable proxy for the skills and information that contribute to the semantic pathway, Nation and Snowling's longitudinal study provides evidence consistent with semantic factors contributing to the development of word reading, as suggested by Plaut and colleagues (1996). However, the nature of this contribution is far from clear. Plausibly, a relationship between vocabulary knowledge and reading development may reflect a general consequence of children who are good or poor at one thing tending to be good or poor at other things. Yet the triangle model assumes a much more specific relationship, with word knowledge playing a more active role at an individual word-by-word level. The first aim of our experiment was to test this assumption. If it is correct, there should be an item-level relationship between word knowledge in the oral domain and reading aloud; that is, an individual's knowledge of the meaning of words should predict his or her ability to read those words.

A second prediction stemming from the triangle model is that the relationship between word knowledge in the oral domain and reading aloud ought to be strongest when children are asked to read words that have inconsistent mappings between orthography and phonology. Although the semantic pathway contributes to the pronunciation of all words regardless of lexicality or regularity, it is argued to be most important (and most manifest) when reading irregular words because these words are read less successfully by the phonological pathway. Once again, there is evidence from children's reading that is broadly consistent with this prediction. Goff, Pratt, and Ong (2005) found that