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Examining incidental word learning during reading in children: The role of context



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ABSTRACT

From mid-childhood onward, children learn hundreds of new words every year incidentally through reading. Yet little is known about this process and the circumstances in which vocabulary acquisition is maximized. We examined whether encountering novel words in semantically diverse, rather than semantically uniform, contexts led to better learning. Children aged 10 and 11 years read sentences containing novel words while their eye movements were monitored. Results showed a reduction in reading times over exposure for all children, but especially for those with good reading comprehension. There was no difference in reading times or in off-line post-test performance for words encountered in semantically diverse and uniform contexts, but diversity did interact with reading comprehension skill. Contextual informativeness also affected reading behavior. We conclude that children acquire word knowledge from incidental reading, that children with better comprehension skills are more efficient and competent learners, and that although varying the semantic diversity of the reading episodes did not improve learning per se in our laboratory manipulation of diversity, diversity does affect reading behavior in less direct ways.

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Introduction

From mid-childhood onward, children acquire hundreds of new words every year from their reading experience (Nagy & Anderson, 1984). Once the basics of learning to read are in place, children rapidly learn new orthographic forms, with evidence of some orthographic learning following a single exposure (Nation, Angell, & Castles, 2007; Nation & Castles, 2017; Share, 2004). Learning the meaning of a new word is more complex, with multiple exposures needed to develop a full understanding of its meaning. Although this kind of incidental word learning through reading is commonplace, we know relatively little about how the gradual acquisition of word knowledge via reading occurs or the contextual factors that help or hinder the acquisition of new word meanings.

Nation (2017) argued that reading experience provides exposure to words in different contexts or episodes that over time sum to a rich database about their lexical history within an individual's experience. The product of these encounters is lexical quality, defined as variation in the extent to which the mental representation of a word specifies its meaning and form (Perfetti, 2007). In this study, we investigated the nature of contextual experience and asked whether word learning is enhanced when reading experience is varied rather than maintained.

Contextual diversity and lexical processing

Few studies have explored contextual experience and word learning directly. Relevant, however, is a growing literature on contextual diversity and lexical processing. Adelman, Brown, and Quesada (2006) operationalized contextual diversity as the number of unique documents a word appears in across a large corpus. Document count predicted lexical decision time in skilled readers, accounting for more unique variance than word frequency, demonstrating that it is not simply how often a word occurs in language, but also the number of different contexts it appears in, that is critical. Document count also predicts lexical decision performance in children (Perea, Soares, & Comesaña, 2013), and the general effect has been replicated using eye movements during sentence reading in adults (Plummer, Perea, & Rayner, 2014).

Why should document count matter? One possibility is that document count is associated with semantic diversity, broadly defined as the extent to which different contexts are similar in meaning. Consistent with this idea, semantic diversity is closely associated with lexical decision performance in adults; words experienced in contexts that are semantically diverse are processed faster than words experienced in less semantically diverse contexts (Hoffman & Woollams, 2015; Jones, Johns, & Recchia, 2012). At the same time, people are slower to make judgments about words high in semantic diversity in tasks that tap meaning. For example, Hoffman and Woollams (2015) reported slower response times in a word association task for words higher in semantic diversity despite the same words being processed more quickly in lexical decision.

The effect of semantic diversity on word learning has also been examined. Jones et al. (2012) used an artificial learning paradigm with adults and found that increasing the number of exposures to a word influenced learning only when the repetitions were accompanied by a modulation in semantic context; merely repeating the episode without varying its semantic content did not influence learning. Similarly, Johns, Dye, and Jones (2016) exposed adults to novel words in semantically diverse contexts or more uniform contexts. Greater diversity during learning was associated with faster recognition, as indexed by performance in a lexical decision task. Johns and colleagues also found that the meanings of items trained in redundant contexts were better discriminated than those experienced in more diverse contexts. These results fit comfortably with the finding that words high in semantic diversity enjoy a processing advantage in lexical decision but are slowed in tasks that require semantic access (Hoffman & Woollams, 2015).

In contrast to these findings, Bolger, Balass, Landen, and Perfetti (2008) found that contextual variation led to better learning of meaning. Adults read sentences containing rare unfamiliar words either in a novel sentence each time or in the same sentence repeated (therefore, a manipulation of contextual diversity rather than semantic diversity). At post-test, words experienced in multiple contexts showed an advantage in meaning generation and sentence completion tasks, consistent with their

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