



Effects of vocabulary instruction on measures of language processing: Comparing two approaches



Margaret G. McKeown*, Isabel L. Beck

University of Pittsburgh, United States

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ABSTRACT

This study examined effects on kindergartners ($n = 131$) of two approaches to vocabulary instruction, repetition and interactive, and a control condition, along a progression of language processing, using a within subject design. The repetition condition featured repeated readings of a story and practice with definitions. The interactive condition featured multiple contexts and active processing of the words. Students were assessed with experimenter-designed measures of meaning recognition, comprehension, and production. Repetition and interactive approaches enabled students' recognition of word meanings and higher-order processing compared to the control. Two measures of higher-order processing showed advantage for interactive instruction relative to repetition instruction.

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There no longer seems to be much controversy in the idea that attention to vocabulary needs to begin early in children's schooling, as early as kindergarten, and perhaps even as early as preschool. Evidence of the gap in vocabulary for children of different SES groups by age three (Hart & Risley, 1995) and consistent findings that children's early vocabulary knowledge strongly predicts their later reading success (Biemiller & Slonim, 2001; Cunningham & Stanovich, 1998; Hart & Risley, 1995; Wagner et al., 1997) demonstrate the urgency of getting young students off to an early start. Consensus reports on literacy have universally recommended early attention to children's vocabulary development in school (Common Core State Standards, 2010; National Early Literacy Panel, 2008; National Reading Panel, 2000; Snow, Burns & Griffith, 1998).

Questions remain, however, about whether vocabulary instruction for young children can be successful in promoting not only word knowledge but also children's literacy potential. Because the value of vocabulary instruction lies in its ability to affect students' literacy development, an important goal of this study was to gauge the impact of instruction not only on word knowledge but also on comprehension.

* Corresponding author at: 743 Learning Research and Development Center, University of Pittsburgh, 3939 O'Hara Street, Pittsburgh, PA 15260, United States. Tel.: +1 412 624 7068; fax: +1 412 624 2345.

E-mail address: mckeown@pitt.edu (M.G. McKeown).

Empirical and theoretical foundation

A traditional vehicle for enhancing children's language skills, including vocabulary, has been storybook reading. Positive correlations between being read to and eventual reading achievement have appeared in journals for over 50 years (Teale, 2003). Positive effects specifically on vocabulary were documented by Mol, Bus, and De Jong (2009) in a meta-analysis of 31 studies of classroom interactive read alouds. Using read aloud events to promote vocabulary learning aligns with a language development perspective, which holds that exposure to and interaction with language in natural settings is the key to literacy development.

With the literature pointing to reading aloud as a natural vehicle for enhancing vocabulary, researchers began to focus more directly on the effects of single read-aloud events on incidental learning of specific vocabulary items that appeared in the text (Biemiller & Boote, 2006; Elley, 1989; Nicholson & Whyte, 1992; Penno, Wilkinson, & Moore, 2002; Robbins & Ehri, 1994; Sénéchal, Thomas, & Monker, 1995). Researchers generally found learning effects, but they were quite limited, for example, no gain in Justice, Meir, and Walpole (2005) to 3% and 15% on two different stories in Elley (1989). Studies employing read alouds for vocabulary development then moved from simple story readings to enhancements such as repeated readings of stories, assuring that the contexts supported word meanings (Robbins & Ehri, 1994), and explaining word meanings as a story was read (Biemiller & Boote, 2006; Collins, 2010; Elley, 1989; Justice et al., 2005; Penno et al., 2002).

Repeated readings of stories and providing word meaning brought substantial increases in word learning. These instructional

enhancements chiefly utilized memory and association processes, helping students associate a word with its meaning and boosting the chances that the association would be remembered by offering repeated encounters. The theoretical perspective underlying this approach is based on the hypothesis that an exposure to a word in context establishes an initial referent for the word, and direct explanation of the word's meaning provides a generalization of word meaning that includes sufficient information for comprehending a variety of uses and contexts for the word. Repetitions of readings and explanations strengthen the connection to allow future incidental encounters with the new word to be better understood (Biemiller & Boote, 2006).

Another approach to enhancing students' vocabulary development draws from a cognitive processing framework, which entails the theoretical notion that active processing—active or attentive mental manipulation of ideas—is necessary to learning if the learner is to achieve the ability to use and apply new information (Brown, Bransford, Ferrara, & Campione, 1983; Miller, 2003; Sternberg, 1979, 1982). Implications of a cognitive-processing perspective for vocabulary center on the need for learners to interact with and integrate various specific contexts of word use in order to form generalizations that are of sufficient quality to assist comprehension (Bolger, Balass, Landen, & Perfetti, 2008; Nagy & Scott, 2000; Perfetti & Stafura, 2014; Perfetti & Hart, 2002).

Two early reviews of vocabulary instructional research supported a cognitive processing orientation. Both Mezynski (1983) and Stahl and Fairbanks (1986) concluded that instruction that affected comprehension included multiple exposures to each word, both definitional and contextual information, and active, or deep, processing. More recent work has elaborated the view that semantic learning requires multiple exposures in a variety of contexts and active processing (Marulis & Neuman, 2013; Nagy & Scott, 2000; Perfetti & Stafura, 2014; Perfetti & Hart, 2002). As Perfetti and Hart's (2002; Perfetti, 2007) lexical quality hypothesis posits, experiencing words in multiple, informative contexts allows learners to build rich networks of connections that in turn lead to complex, flexible, and nuanced representations of word meaning. Such representations enable learners to bring the most relevant ideas to bear in making sense of subsequent contexts in which the word is met.

A cognitive processing orientation underlies several instructional techniques for vocabulary. For example, *semantic features analysis* (Anders, Bos, & Filip, 1984) and *semantic mapping* (Margosein, Pascarella, & Pflaum, 1982) engage learners' processing by having students examine how words are related through analysis and discussion of word characteristics (Johnson & Pearson, 1978, 1984). Both techniques have resulted in improved word learning and comprehension (Anders et al., 1984; Margosein et al., 1982).

Studies by Beck and McKeown and their colleagues with fourth grade students also reflected a cognitive processing orientation (Beck, Perfetti, & McKeown, 1982; McKeown, Beck, Omanson, & Perfetti, 1983; McKeown, Beck, Omanson, & Pople, 1985). Instruction was designed to promote fluent access to word meanings and rich semantic connections through multiple exposures of target words in different contexts and activities to engage student processing. For example, students were asked to discuss if they would *berate* someone who had *inspired* them. Such a question prompts students to consider the meaning of the two words, activate the circumstances under which berating is relevant, and decide whether those circumstances fit a person who inspires one. The instruction was found to affect not only knowledge of word meanings, but also students' higher-order language processing, including speed of access to taught words, ability to integrate new words into contexts, and comprehension of text that used the taught words.

Vocabulary research featuring active processing initially involved students in intermediate grades through high school. But many researchers have now used a cognitive processing framework

to develop vocabulary instruction for much younger students (Beck & McKeown, 2007; Coyne, McCoach, Loftus, Zipoli, & Kapp, 2009; Coyne, Simmons, Kame'enui, & Stoolmiller, 2004; Silverman, 2007; Wasik & Bond, 2001). Based on theory and prior research with older students, we might expect such studies with younger students to impact higher-order abilities such as comprehension as well. However, although these studies have found positive impact on word learning, they have not examined effects on comprehension, with one recent exception: the study by Coyne et al. (2010), which showed a trend ($p = .11$) toward enhanced comprehension on a listening measure for kindergartners who learned vocabulary through active processing instruction relative to no treatment controls.

Purpose

This study has three major purposes. The first is to compare two types of vocabulary instruction for kindergarten children. The second is to examine the effects of vocabulary instruction along a progression of language processing, from recognition of word meaning to comprehension and production, and the third is to use innovative measures to examine points along this processing progression.

Rationale for the study

There has been no research comparing the two types of instruction considered here, which are designed around either repeated story readings or cognitive processing activities. Both begin with read alouds and provide definitions for target words. Repeated readings instruction comprises repeated readings of stories and practice of target word definitions. Cognitive processing instruction features presentation of a variety of contexts for the words and asking students to generate, evaluate, and explain various uses for the words. Such an investigation is valuable, as both approaches are prevalent in the instructional and research literature. Because the two approaches engage different processes, understanding the effects of each sheds light on the kind of processing that may promote different aspects of verbal functioning.

Rationale for outcomes measured

Assessment of what students learn from vocabulary instruction has been quite restricted (Pearson, Hiebert, & Kamil, 2007). Typically, studies employ measures of word knowledge that involve, essentially, knowing a definition for the words. Results of such assessments are limited in that we do not know if they indicate that students have truly developed a generalized representation of what a word means, or if students are simply recalling a definition from instruction. Some studies also attempt to measure comprehension effects, often using standardized measures of text comprehension, usually with meager results (Elleman, Lindo, Morphy, & Compton, 2009). A definition task and a general comprehension measure represent extreme ends of a continuum from proximal to distal outcomes. Thus, for example, positive results on a definition task and null results on a comprehension task would leave a wide gap in understanding what students can do with the words they have been taught.

A key goal of this study was to gauge the impact of instruction on a progression of language processes, from recognition of word meanings, which calls on lower-order processes of memory and association, to higher-order processes of comprehension and production. Higher-order processes go beyond lower-order processes such as perception, memory, and association, by requiring combinations of cognitive actions and use of information beyond what is given.

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