

Evidence-Based Strategies for Improving Children’s Vocabulary Knowledge

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Overview

Improving children’s vocabulary knowledge is an important goal of early education. Vocabulary knowledge is foundational to numerous academic achievements, including reading for meaning and reading across the content areas. Importantly, there are several well-researched strategies that can be used to improve children’s vocabulary knowledge within the early education classroom. The white paper is organized to provide an overview of vocabulary development, followed by a discussion of risk factors in that development. The paper concludes by discussing two specific strategies that can be used to enhance children’s vocabulary development within the early education settings.

Vocabulary Development: An Overview

Language refers to the cognitive process by which one formulates ideas and thoughts; if one so wishes, these ideas and thoughts may be then communicated via speech, sometimes referred to as oral language. It is generally understood that language is multidimensional. It is best thought of as encompassing several distinct domains. The domain of phonology, for instance, encompasses the representations of the sounds within a language, whereas the domain of syntax encompasses representations of the rules that govern how sentences, clauses, and phrases are organized within a language. The domain of interest to this white paper is that of semantics, which encompasses representations of the words and meanings that make up a language, often referred to as one’s vocabulary system or lexicon. One may have heard the word *semantics* used to describe an instance when two individuals are agreeing on something in principle, while using different terms to describe that principle (e.g., “It’s just a matter of semantics.”). Early in life, children develop an understanding of the importance of using precise terms to describe their own interests and needs or the value of semantics.

In the field of early childhood education, the term *vocabulary knowledge*, or *vocabulary skill*, is commonly used to describe the semantics domain of language. Vocabulary generally is used to refer to the breadth and depth of an individual's knowledge of words. Put simply, a child with "well-developed vocabulary knowledge" understands and uses many different words, whereas a child with underdeveloped vocabulary knowledge does not. At very young ages, children with underdeveloped vocabulary knowledge may have difficulties getting their basic needs met because they cannot express themselves with precision. In turn, they may rely on externalizing behaviors (yelling, pushing, crying) to get their needs met or to vent frustration. At later ages, limitations in vocabulary knowledge can cause further difficulties, such as having difficulty comprehending written texts, completing math problems, developing strong relations with teachers, and engaging prosocially with peers (e.g., Coplan & Armer, 2005; Justice, Cottone, Mashburn & Rimm-Kaufman, 2008).

The term *vocabulary* is generally synonymous with the notion of a mental dictionary, personal dictionary, or lexicon, all of which serve to capture the store of words known and used by an individual. Technically, an individual's mental lexicon does not contain distinct "words," per se, but rather a set of neural connections that collectively create a lexical network. The representation of a word occurs through patterns of spreading activation within this neural network; this activation serves to convey information about lexical or meaning-related aspects of the word (e.g., synonyms, antonyms, closely related words), as well as its phonological (how a word sounds), orthographical (how a word looks in print), and syntactic forms (the word's grammatical class[es]). For instance, when one hears or reads the word *red*, the meaning of the word is represented via the vast number of connections that are activated (e.g., other colors, such as blue and pink; things that are red, such as capes and certain birds). Put simply, one knows the word *red* because of its relationships with many other words and concepts within the lexicon, as represented by a vast network of connections. Although discussion of the cognitive processes involved with vocabulary knowledge is beyond the scope of this paper, it is important to note that children's knowledge of a word reflects the underlying *representation* of a word in terms of its lexical, phonological, orthographic, and syntactic forms within the mental lexicon, and the connections of this representation to other entries in the lexicon. A word that is known well, so to speak, is one that can be readily retrieved and for which knowledge of its lexical, phonological, orthographic, and syntactic features is well developed.

The development of vocabulary knowledge—and the creation of one's unique personal dictionary—begins very early in life and continues across the life span. The nature of vocabulary development, such as the *types* of words learned and the *pace* of acquisition, varies over the life span. Far more is known about the earliest period of vocabulary development, during infancy and toddlerhood, than about the later periods, in the primary grades and beyond. For infants and toddlers, vocabulary development largely involves attaining functional, high-frequency words with one meaning (e.g., *mama*, *kitty*, *milk*), many of which are nouns (Bornstein et al., 2004). These words tend to be used in highly contextualized and restricted ways. For instance, the word *cup* may be used by a child to refer to only one very specific cup rather than the entire range of cups. At these ages, vocabulary development occurs relatively slowly at first, with children acquiring only about 50 words in their expressive repertoire over the first 18 months of life;

this is followed by a word-learning spurt, typically appearing between 18 and 24 months of age, that signals an increasingly robust period of acquiring new words (Ganger & Brent, 2004). It is commonly estimated that children are acquiring between five and 10 new words each day from 18 months of age forward. The sheer velocity of vocabulary development at this stage makes it one of the most scientifically interesting aspects of early childhood.

As children enter the preschool years and early primary grades, there are some salient shifts in their developing vocabulary knowledge. Children at these ages are learning more abstract words with potentially multiple meanings (e.g., *multiply*, *attend*, *evolve*), and they use those words in a variety of contexts and for a variety of purposes. During these years, children's vocabularies continue to amass quite rapidly, with estimates suggesting that at these ages children will acquire between 3,000 and 5,000 words annually, which translates to the acquisition of as many as 13 new words per day (Lorge & Chall, 1963; Vermeer, 2001).

As these figures suggest, vocabulary knowledge represents an *unconstrained skill*, such that the volume of items (i.e., individual words or representations) that can be acquired or learned is potentially infinite, and one's vocabulary continues to grow across one's life time (Paris, 2005). In contrast, *constrained skills*, such as learning the names of the alphabet letters, have more finite boundaries, and mastery occurs in a relatively short period. At the same time, vocabulary knowledge also represents an emergent structure, meaning that its development within an individual follows no preconceived blueprint. Rather, one's vocabulary knowledge develops into a complex structure via emergent processes that capture one's exposure to and experiences with different words in various contexts at various times and in various dosages.

Children's vocabulary knowledge has received increased attention in the last decade, given improved awareness of the positive relations between vocabulary knowledge and reading comprehension (see Ouellette, 2006). Both the breadth and the depth of young children's vocabulary knowledge exert direct and indirect effects on their future third-grade reading comprehension (NICHD ECCRN, 2005). The direct effect is such that children's vocabulary skills during the preschool years are directly related to future comprehension, whereas the indirect effect is such that young children's vocabulary skills affect future comprehension via phonological awareness. That children's vocabulary skills operate along direct and indirect pathways to influence reading comprehension makes them an important skill to leverage in the design of reading curriculum.

Vocabulary knowledge is often conceived as an oral-language skill; however, the act of reading involves drawing connections between words that are read (i.e., are decoded) and the stored meanings of those words within one's vocabulary system. Specifically, a word that is decoded in its orthographic (written) form (e.g., couch) must be mapped to a lexical representation (i.e., a vocabulary "word") for meaning-making to occur. Reading comprehension, a far more complex process than mapping decoded words to lexical referents, involves developing a mental representation of a text; this is greatly informed by word-level processes, including knowledge of

the individual meanings of words (Perfetti, 2007). Vocabulary knowledge should thus be conceived as an oral-language skill that is critically important to reading achievement (Perfetti, 2007). Researchers who design and test vocabulary instruction do so not only to improve children's breadth and depth of vocabulary knowledge in its own right, but also as a potential mechanism for improving reading comprehension across the content areas (Beck, Perfetti & McKeown, 1982; Williams, Hall & Lauer, 2004; Williams, Stafford, Lauer, Hall & Pollini, 2009).

Risk Factors and Vocabulary Development

Children's vocabulary knowledge is influenced by both "nature" and "nurture," the former referring to the biological bases of one's language skill and the latter representing the important role that the environment plays in explaining individual differences among children in their language development. It is well documented that one's genetics, or biology, is influential to growth in vocabulary skills over time, as shown by studies of monozygotic (identical) and dizygotic (fraternal) twins; the vocabulary skills of monozygotic twins are more similar than those of dizygotic twins, as monozygotic twins are generally more similar than dizygotic twins (Kovas et al., 2005). Consequently, there are a range of biological factors that are known to affect children's vocabulary skills, including hearing loss, language impairment, intellectual disability, and autism spectrum disorder. These conditions affect the neurobiological system, which in turn can inhibit vocabulary growth over time. For instance, some evidence suggests that children who have chronic hearing loss across early childhood, as occurs when children have recurrent bouts of otitis media (fluid and infection in the middle ear cavity) may have small lags in their vocabulary development compared with children without these recurrent bouts; this is because the fluid in the middle ear space compromises development of representations of words during the course of ongoing conversations and other linguistic experiences (Paradise et al., 2000). More serious consequences to vocabulary development are seen with other developmental conditions, such as language impairment (LI). LI is a neurobiological developmental disorder that affects about 7% of young children; a hallmark of this developmental disability is that children show delays in learning new words; acquisition of a novel word takes longer than it does for typically developing children (Hansson, Forsberg, Löfqvist, Mäki-Torkko & Sahlén, 2004). This can result in an overall smaller vocabulary for children with language impairment compared with children without such conditions.

Children's vocabulary development is also affected by the environmental conditions in which they are reared, referred to as "nurture." For children to acquire new words, they must be exposed to them repeatedly and informatively. Children who are developing within linguistically impoverished environments have less opportunity to acquire new words than children in enriched environments, and this can significantly inhibit growth of the mental lexicon. For instance, children reared in Eastern European orphanages, which tend to be linguistically impoverished environments in that children are not spoken to often, have smaller vocabularies than children raised outside of these orphanages (Nelson et al., 2007).

A linguistically enriched environment is one in which children have the opportunity to hear a diverse range of words in many distinct, informative contexts. In such environments, it is not necessarily the case that there are efforts to explicitly teach children new words; rather, children's

References (continued)

- Sharif, I., Rieber, S., Ozuah, P. O., & Reiber, S. (2002). Exposure to Reach Out and Read and vocabulary outcomes in inner city preschoolers. *Journal of the National Medical Association*, 94(3), 171.
- Shi, R., & Melançon, A. (2010). Syntactic categorization in French-learning Infants. *Infancy*, 15(5), 517-533.
- Throneburg, R. N., Calvert, L. K., Sturm, J. J., Paramboukas, A. A., & Paul, P. J. (2000). A comparison of service delivery models: Effects on curricular vocabulary skills in the school setting. *American Journal of Speech-Language Pathology*, 9(1), 10-20.
- Vermeer, A. (2001). Breadth and depth of vocabulary in relation to L1/L2 acquisition and frequency of input. *Applied Psycholinguistics*, 22(02), 217-234.
- Wasik, B. A., & Bond, M. A. (2001). Beyond the pages of a book: Interactive book reading and language development in preschool classrooms. *Journal of Educational Psychology*; *Journal of Educational Psychology*, 93(2), 243.
- Whitehurst, G. J., Arnold, D. S., Epstein, J. N., Angell, A. L., Smith, M., & Fischel, J. E. (1994). A picture book reading intervention in day care and home for children from low-income families. *Developmental Psychology*, 30(5), 679.
- Whitehurst, G. J., Falco, F. L., Lonigan, C. J., Fischel, J. E., DeBaryshe, B. D., Valdez-Menchaca, M. C., & Caulfield, M. (1988). Accelerating language development through picture book reading. *Developmental Psychology*, 24(4), 552.
- Whitehurst, G. J., Zevenbergen, A. A., Crone, D. A., Schultz, M. D., Velting, O. N., & Fischel, J. E. (1999). Outcomes of an emergent literacy intervention from Head Start through second grade. *Journal of Educational Psychology*, 91(2), 261.
- Williams, J. P., Hall, K. M., & Lauer, K. D. (2004). Teaching expository text structure to young at-risk learners: Building the basics of comprehension instruction. *Exceptionality*, 12(3), 129-144.
- Williams, J. P., Stafford, K. B., Lauer, K. D., Hall, K. M., & Pollini, S. (2009). Embedding reading comprehension training in content-area instruction. *Journal of Educational Psychology*, 101(1), 1.
- Zimmerman, F. J., Gilkerson, J., Richards, J. A., Christakis, D. A., Xu, D., Gray, S., & Yapanel, U. (2009). Teaching by listening: The importance of adult-child conversations to language development. *Pediatrics*, 124(1), 342-349.

References (continued)

Zucker, T. A., Justice, L. M., Piasta, S. B., & Kaderavek, J. N. (2010). Preschool teachers' literal and inferential questions and children's responses during whole-class shared reading. *Early Child Res Q*, 25(1), 65-83.