

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

ingrained capacity to acquire new words makes use of the linguistically enriched environment to do so with little overt effort. One study, for instance, showed that young children are as adept at acquiring novel words that they overhear in a conversation between two adults as they are when those words are spoken directly to them in a conversation (Akhtar, 2005). Put simply, it is important that young children spend time in linguistically rich environments, such as homes and classrooms, but these contexts do not necessarily need to feature explicit vocabulary instruction for them to be profitable for children's vocabulary growth.

A common approach to assessing the linguistic enrichment of an environment or instructional context is to calculate the number of different words (NDWs) that occur, referred to as a measure of *lexical diversity*. To illustrate, here are two snippets of an infant/toddler teacher talking to a child in her care; both snippets are captured when the child is being bundled up to go outside on a walk.

Snippet 1

*Let's put your jacket and shoes on so we can head outside. It's cold outside, so we need to really bundle up.
OK, I've got your foot in my hand, and I'm pulling on your shoe. Your sock is so pretty! I bet it keeps you warm. OK, got both shoes on and now it's jacket time. Let's put this on really tight so we can stay warm.*

Word count: 68

Number of different words: 44

Snippet 2

Let's get this jacket on. Get it on. OK, we got your jacket on. It's on good. OK, let's get your shoes on. Put your shoes on. We got your shoes on. OK, let's go.

Word count: 35

Number of different words: 15

Assuming that each of these snippets represents about one minute of adult-child interaction, the number of different words (44 and 15, respectively, for Snippets 1 and 2) shows that the nature of the linguistic environment differs significantly in the two scenarios. The child in Snippet 1 was exposed to three times the number of different words as the child in Snippet 2, and considerable evidence suggests that such variances are important to children's development: the number of different words that children hear in their language-learning environments is associated with the number of words they use and understand (Hoff, 2003). Although the two snippets presented here show only modest differences in children's exposure to different words, it is important to consider these differences as they unfold across days, weeks, and months. If we extrapolate from these 1-minute interactions to eight hours per day x five days per week x 52 weeks, assuming they

represent an infant's time in a day-care center, the difference in vocabulary exposure for Snippet 1 versus Snippet 2 is on the magnitude of nearly 4,000,000 words.

One risk factor that is cited often for its harmful effects on children's vocabulary development is poverty. In the United States today, almost one-half of children (44%) live in low-income (near-poor) households, and more than one in five (22%) live in poverty (Jiang, Ekono & Skinner, 2015). The impact of poverty on children's language development must be understood within the broader context of the impact of poverty on a household. As Jiang and colleagues aptly state, poverty "does not happen by chance." (p. 1) In most low-income homes and poor, there is a single head of household, typically a mother, and this head of household is likely to have only a limited education and work in a low-paying job, if at all (Jiang et al., 2015). The circumstances serve to create psychologically and economically stressful, chaotic households for children (Garrett-Peters et al., 2016), and may be the consequence of mental-health issues among the household caregivers (Coley, Lynch & Kull, 2015). Not surprisingly, the caregivers within low-income and poor homes often do not have the psychological resources or background knowledge to provide children with the linguistically rich interactions that are more commonplace in advantaged homes, in which the caregivers are likely to be well-educated, less stressed, and economically secure. At the same time, low-income caregivers may not have well-developed language skills themselves for a variety of reasons. For instance, the caregivers may have a history of developmental disabilities, which then compromised their educational attainment and employment potential (Conti-Ramsden, Durkin, Mok, Toseeb & Botting, 2016). Caregivers who have limited language skills themselves will find it difficult if not impossible to provide children with linguistically rich experiences in the home environment. In such instances, early education, such as preschool and prekindergarten, provides an unparalleled mechanism for improving the early vocabulary knowledge of children reared in poverty as well as those with developmental disabilities (e.g., hearing loss, LI).

Strategies for Enhancing Children's Vocabulary Development

Decades of research studies have been designed to develop and test strategies for enhancing children's vocabulary development, with some studies focused on typically developing children (e.g., Penno, Wilkinson & Moore, 2002), but many focused on children from low-income households (Justice et al., 2010; Justice, Meier & Walpole, 2005; Wasik & Bond, 2001; Whitehurst et al., 1999) and/or children with disabilities (Gillam et al., 2008; Girolametto, Pearce & Weitzman, 1996; Throneburg, Calvert, Sturm, Paramboulas & Paul, 2000). Two sets of strategies have the largest and most consistent effects on children's vocabulary development: interactive read-alouds and conversations.

Interactive Read-Alouds

Reading books often with young children is viewed as one of the most effective strategies for improving young children's vocabulary skills. Programs such as Reach Out and Read, whereby physicians "prescribe" read-alouds and give books to caregivers of young children at well-child visits (Sharif, Rieber, Ozuah & Reiber, 2002), exist to scale up the benefits of this strategy. Considerable evidence shows, however, that benefits to children's vocabulary knowledge are conditional on three features of the read-aloud: (1) read-alouds are repeated, (2) read-alouds

are interactive, and (3) read-alouds provide explicit definitions of novel words. The latter feature is what makes repeated interactive read-alouds an *explicit* means for promoting children's vocabulary development, as opposed to an implicit means (Marulis & Neuman, 2010).

1. Read-alouds are repeated. The representation of a novel word within one's lexicon, such as the word *darkness*, becomes more refined with each exposure to that word; with one exposure to a word, one might develop a tentative, rough representation of its sound and meaning (e.g., darkness has something to do with night), whereas after numerous exposures, the representation becomes highly specified and precise. To this end, the breadth and depth of children's vocabulary knowledge is enhanced through repeated exposures to words, especially when these repeated exposures are highly informative to provide a great deal of information about the word, including how it sounds, how it looks graphically, and what it means.

Reading books with children often will expose them to a large number of novel words, enhancing their general vocabulary knowledge (i.e., the breadth of their lexicon). This is because many children's books have deeper "lexical reservoirs" (density of lower-frequency words) than may occur in everyday conversations (Mesmer, 2016). However, it is not only the words contained in books that are important for enhancing children's vocabulary knowledge; evidence points to adult talk during book reading to be more lexically rich than conversations outside of book-reading interactions (Mesmer, 2016).

Whereas it is important to read books to children often as an effort to expand their vocabulary knowledge, it is also necessary that children are read the same books repeatedly. This is useful for helping children to develop more refined representations of words within the lexicon, through repeated exposure to novel words within the book itself as well as conversations about these words in the context of adult-child book-reading discussions (Penno et al., 2002). As noted previously, vocabulary development is a gradual process whereby representations of words are increasingly refined with time and exposure. Researchers have directly documented the importance of repeated reading of the same storybook for children, as in a study by Elley (Elley, 1989). Elley examined the acquisition of new vocabulary words by eight-year-old children in New Zealand over the course of three reading sessions for each of two storybooks. Children were pre- and post-tested for their knowledge of 36 unfamiliar words selected from the storybooks, as well as five control words that did not occur in the books. Elley's work showed that the number of times a particular word occurred in a storybook text was a powerful predictor in explaining which words children were most likely to acquire. Elley also showed that children's knowledge of words incrementally increased from the first to the third reading. Given the importance of repeated reading of storybooks for children's vocabulary development, numerous programs designed to facilitate children's vocabulary growth feature repeated reading of books as a core element of the instructional approach (Justice et al., 2005; Wasik & Bond, 2001; Whitehurst et al., 1994; Whitehurst et al., 1999).

2. Read-alouds are interactive. Often, when adults read books with children, the children are engaged only passively in the interaction; they listen to the story and make comments or ask questions about the text occasionally (Price, Kleeck & Huberty, 2009). A seminal study conducted in 1988 on an approach called "dialogic reading" showed the value of involving children more

actively in read-aloud sessions (Whitehurst et al., 1988). In this study, researchers examined the effects of dialogic reading on young children's vocabulary skills. In the dialogic reading sessions, parents employed a variety of strategies to involve their children as active participants in the reading session (e.g., open-ended questions, prompts). The researchers speculated that active involvement and engagement in read-alouds would provide an important mechanism by which to stimulate children's vocabulary skills. Indeed, children whose parents used a dialogic reading style for four weeks significantly improved their vocabulary skills compared to a control group.

The term *dialogic reading* has gradually been replaced by the term *interactive reading* to emphasize the value of conversational interaction between adults and children during read-alouds (Mol, Bus & de Jong, 2009). Adults can use a number of evocative strategies to make the read-aloud interactive: asking open-ended questions, helping children to retell or act out the story, and discussing new words within the text. A meta-analysis published in 2009 of 31 studies of interactive read-alouds showed that effects of this approach on children's receptive and expressive vocabularies are consistently large in size (effect-size estimates of .45 and .62, respectively) (Mol et al., 2009). Such work highlights the importance of not only reading books repeatedly with young children, but also ensuring that children are actively involved and conversationally engaged in these experiences.

3. Read-alouds provide explicit definitions of novel words. Repeated, interactive reading of books with children tends to enhance vocabulary knowledge, but effects observed largely concern breadth of vocabulary knowledge: children who are read to often have larger vocabularies than children who are read to less often (Leseman & Jong, 1998). In recent years, attention has turned to considering how to foster children's depth of knowledge of lower-frequency words. Lower-frequency words are those that do not occur commonly in speech or print, but many of these words are important for reading comprehension as they occur across many texts. Referred to as "general all-purpose academic words," words such as *aspire*, *accommodate*, *fixture*, *examine*, *margin*, and *impression* are lower-frequency words that are likely to occur across multiple subject-area reading materials in the primary and later grades. These words may compose up to 10% of the words in grade-level reading materials, creating a major stumbling block for children who do have these words in their lexicons. Researchers and practitioners have increasingly expressed an interest in determining ways to improve children's depth of knowledge of this corpus of all-purpose academic words to promote their ability to read across the content areas.

These lower-frequency words can often be found within children's storybooks; for instance, these are a few of the general all-purpose academic words found in the children's storybook *Scaredy Squirrel Makes a Friend*: *encounter*, *individual*, *thorough*, and *impression*. However, when adults read storybooks with children, even interactively, seldom do the adults and children explicitly discuss the meanings of lower-frequency words contained within the books (Zucker, Justice, Piasta & Kaderavek, 2010). Because these words are lower-frequency, many young children are unlikely to have well-developed representations of these words, as they will have encountered them seldom before, if ever. Similarly, they are unlikely to encounter these words again in the near future, as they are low-frequency in occurrence.

There have been a number of studies in recent years designed to provide children with the opportunity to learn more about these words in read-aloud contexts. When adults read a storybook with children and arrive at one of these all-purpose academic words, they are encouraged to pause at the end of the page on which the word occurs and have an explicit conversation about it. For instance, work by Coyne and his colleagues involves teachers following a scripted approach to discuss the meaning of all-purpose academic words when they occur in a text. First, the teacher identifies a small set of words for children to listen for as they are read to; children are asked to raise their hand when they hear one of the words. Second, when children identify one of the target words, the teacher asks the children to say the word aloud. Third, the teacher re-reads the sentence aloud, emphasizing the target word. Fourth, the teacher provides a child-friendly definition of the word (e.g., “To *examine* something means to study it very closely.”). Further discussion of the word ensues until the teacher and children returned to the text of the book and continued to read (Coyne et al., 2010). Studies consistently show that these elaborate discussions of words, embedded within read-aloud discussions, deepen children’s knowledge of the target words (Coyne, McCoach & Kapp, 2007; Coyne et al., 2010). Consequently, when teachers read aloud books to children in their classrooms, they are encouraged to embed explicit discussions of all-purpose academic words in the interactive reading experience.

Conversations

Vocabulary development occurs not only in the context of read-alouds, but also in the context of everyday conversations that children have with one another as well as with adults. In fact, the sheer velocity and size of children’s early vocabulary trajectories indicate that they are acquiring many words from their conversations across the day (Zimmerman et al., 2009). Studies that have carefully documented the number of conversations in which children are engaged within the home environment show that these are positive, unique predictors of vocabulary growth over time (see Zimmerman et al., 2009).

What is a conversation? A conversation involves the back-and-forth exchange of ideas between two or more people. By definition, a conversation involves two people (at a minimum) each taking one turn on a given topic. For instance:

Mother: How was school today? Did you learn anything interesting?

Child: Nope.

Technically, this is a conversation as there are two participants and each takes a turn. Obviously, this is a very short conversation. Conversations can be much longer, involving many turns across the conversational participants.

For young children, conversations with adults provide perhaps the most crucial mechanism for advancing their vocabulary knowledge. Within a conversation, children have the opportunity to hear a novel (new, unknown) word, potentially several times, and within the conversation acquire more detailed information about that word so as to deepen its representation. As an example:

Teacher: This is a blueprint. (*holds up the blueprint*) A blueprint lays out the look of a building. This is actually the blueprint of our school.

Child: That our school? (*points to the blueprint*)

Teacher: Yes, Juan, this blueprint shows what our school looks like on paper. Here is our room. And here is the door into our room, and the hallway right outside.

This is a conversation a preschool teacher is having with her children as they begin a project focused on the architecture of their school. This conversation is, for most children, the first exposure to the novel word *blueprint*. In the context of this conversation, they have many opportunities to develop a relatively deep representation of this term that includes information about the meaning of the word (i.e., a blueprint is something on paper, and it involves rooms and doors and hallways ...), how it sounds (given that the teacher repeats it several times), as well as its syntactic form (given that the teacher uses it in the noun slot of several sentences, with the article helping to convey its nominal form: “This is a blueprint.”).

When they hear a novel word within a conversation, children are incredibly adept at using the information provided within the sentence to develop a representation of that word. For instance, consider a toddler being pushed by her father in a stroller who participates in this brief conversation:

Dad: Look, that’s a bird. (*points up in sky to bird*)

Child: Bird. (*points to bird; both dad and child are looking at bird as it flies away*)

Dad: It’s flying away.

For this toddler, perhaps this is only the first or second time she has heard the word *bird*. Even in this very brief conversation over the word, the child uses a great deal of information to develop an initial semantic, phonological, and syntactic representation of the word *bird*. Semantically, she represents a bird as something with wings that flies in the sky; phonologically, she has stored the sound sequence /bûrd/ to represent this entity; and, syntactically, she has coded bird in the noun category based on its appearance after the article *a* in what is typically the noun slot of a word (Shi & Melançon, 2010). Future exposures to the word *bird*, which presumably will provide additional, more nuanced information about birds (e.g., Look at the bird! It has such pretty feathers.) will help to deepen the child’s representation of the word *bird*.

Conversations are important for children’s learning of novel words and deepening their representations over time. Researchers have sought to learn more about the conversations that children experience in early education settings. For instance, Cabell and her colleagues examined children’s experiences in multi-turn conversations with their teachers in 44 preschool classrooms (all affiliated with Head Start) (Cabell, Justice, McGinty, DeCoster & Forston, 2015). These researchers studied 1,070 conversations between children and their teachers, finding that about one-half of these conversations were longer conversations (lasting four or more turns)

whereas the other half were shorter conversations (lasting only two or three turns). This study showed that teachers who used two strategies—conversational elicitation and conversational extensions—tended to engage in longer conversations with their children.

Conversational elicitations are strategies that teachers use to engage or entice children into a conversation. The most commonly studied elicitation is using an open-ended question, in which teachers pose a question to which an adequate response would be at least two or more words. Examples of open-ended questions include: *What did you do last night?*, *What did you think about the book we just read?*, and *Why did you choose this one?* Non open-ended questions, also called close-ended questions, include: *How old are you?*, *Which one do you want?*, and *What's this called?* It is important to point out that not all *wh-* questions (who, what, where, when, why) are open-ended questions, as the non-examples show. An open-ended question is best defined as a question that is designed to solicit a long response. In this regard, open-ended questions tend to elicit conversations from children.

Conversational extensions are strategies that teachers use to keep children in conversations once they have begun. According to Cabell et al. (2015), extensions follow a child's utterance and build upon what the child is saying or doing to provide additional information. These extensions work in tandem with elicitations to build multi-turn conversations in preschool settings, as in the following:

Teacher: What do you think will happen when I drop this in? (elicitation)

Child: It'll go to the bottom.

Teacher: Because it sinks. Sinks to the bottom. (extension)

Child: Yeah. Like that thing did.

Teacher: You mean like the anchors did? You're right, those did sink.

(extension) **Child:** That anchor went right down!

Teacher: Yes it did, because it was so heavy. (extension)

This conversation continues for some time, largely as a result of the teacher's ongoing use of extensions following the initial elicitation for a conversation. Note that the extensions are not questions; in general, conversational extensions are statements that serve to expand upon the child's contribution. In early education classrooms in which teachers are observed to use a large volume of conversational elicitations and extensions, teacher-child conversations tend to be much longer and to occur more often than in classrooms in which teachers seldom use elicitations and extensions (Cabell et al., 2015). Importantly, children's participation in multi-turn conversations in the preschool classroom is positively associated with their vocabulary growth over time. Consequently, early childhood educators are encouraged to establish classroom routines that support conversational exchanges and to use strategies that keep the conversation going beyond only one or two turns.

Conclusions

To summarize, children's vocabulary acquisition is one of the most intriguing and commonly studied aspects of early learning and development. In part, this is due to the sheer velocity of growth observed from the toddler years into the primary grades, with children acquiring up to ten new words per day, on average, during this time. However, there is considerable variability among children in both the velocity of their vocabulary development and the size of their vocabularies; in part, this variability reflects differences among children in the quality of the environment in which they are developing their language skills. One goal of early-education programming is to try to mitigate this vocabulary gap, so as to increase the vocabulary skills of children whose home environment may not sufficiently support their vocabulary-development potential.

This white paper identifies two strategies that early educators can use to enhance vocabulary development of children in their classrooms: interactive read-alouds and quality conversations featuring elicitations and extensions. The available evidence suggests that such strategies should lead to significant and meaningful improvements in children's vocabulary knowledge (Marulis & Neuman, 2010).

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