

A Focus on Vocabulary

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Of the many compelling reasons for providing students with instruction to build vocabulary, none is more important than the contribution of vocabulary knowledge to reading comprehension. Indeed, one of the most enduring findings in reading research is the extent to which students' vocabulary knowledge relates to their reading comprehension (e.g., Anderson & Freebody, 1981; Baumann, Kame'enui, & Ash, 2003; Becker, 1977; Davis, 1942; Whipple, 1925). Most recently, the National Reading Panel (2000) concluded that comprehension development cannot be understood without a critical examination of the role played by vocabulary knowledge. Given that students' success in school and beyond depends in great measure upon their ability to read with comprehension, there is an urgency to providing instruction that equips students with the skills and strategies necessary for lifelong vocabulary development.

What Is Vocabulary?

Broadly defined, vocabulary is knowledge of words and word meanings. However, vocabulary is more complex than this definition suggests. First, words come in two forms: oral and print. Oral vocabulary includes those words that we recognize and use in listening and speaking. Print vocabulary includes those words that we recognize and use in reading and writing. Second, word knowledge also comes in two forms, receptive and productive. Receptive vocabulary includes words that we recognize when we hear or see them. Productive vocabulary includes words that we use when we speak or write. Receptive vocabulary is typically larger than productive vocabulary, and may include many words to which we assign some meaning, even if we don't know their full definitions and connotations – or ever use them ourselves as we speak and write (Kamil & Hiebert, in press).

Adding further complexity, in education, the word *vocabulary* is used with varying meanings. For example, for beginning reading teachers, the word might be synonymous with "sight vocabulary," by which they mean a set of the most common words in English that young students need to be able to recognize quickly as they see them in print. However, for teachers of upper elementary and secondary school students, *vocabulary* usually means the "hard" words that students encounter in content area textbook and literature selections.

For purposes of this booklet, we define vocabulary as knowledge of words and word meanings in both oral and print language and in productive and receptive forms. More specifically, we use *vocabulary* to refer to the kind of words that students must know to read increasingly demanding text

with comprehension. We begin by looking closely at why developing this kind of vocabulary is important to reading comprehension.

The Importance of Vocabulary to Reading Comprehension

One of the most persistent findings in reading research is that the extent of students' vocabulary knowledge relates strongly to their reading comprehension and overall academic success (see Baumann, Kame'enui, & Ash, 2003; Becker, 1977; Davis, 1942; Whipple, 1925). This relationship seems logical; to get meaning from what they read, students need both a great many words in their vocabularies and the ability to use various strategies to establish the meanings of new words when they encounter them. Young students who don't have large vocabularies or effective word-learning strategies often struggle to achieve comprehension. Their bad experiences with reading set in motion a cycle of frustration and failure that continues throughout their schooling (Hart & Risley, 2003; Snow, Barnes, Chandler, Goodman, & Hemphill, 2000; White, Graves, & Slater, 1990). Because these students don't have sufficient word knowledge to understand what they read, they typically avoid reading. Because they don't read very much, they don't have the opportunity to see and learn very many new words. This sets in motion the well known "Matthew Effects," Stanovich's (1986) application of Matthew, 25:29—"the rich get richer and the poor get poorer." In terms of vocabulary development, good readers read more, become better readers, and learn more words; poor readers read less, become poorer readers, and learn fewer words.

This particular relationship between vocabulary knowledge and reading comprehension seems clear. But vocabulary knowledge contributes to reading success in other important ways that are perhaps less obvious. For beginning readers, evidence indicates a link between word knowledge and phonological awareness. Young children who have a large number of words in their oral vocabularies may more easily analyze the representation of the individual sounds of those words (see Goswami, 2001; Metsala & Walley, 1998). In addition, vocabulary knowledge helps beginning readers decode, or map spoken sounds to words in print. If children have the printed words in their oral vocabulary, they can more easily and quickly sound out, read, and understand them, as well as comprehend what they are reading. If the words are not in children's oral vocabulary, they have trouble reading the words and their comprehension is hindered (National Reading Panel, 2000). Thus, an extensive vocabulary is the bridge between the word-level processes of phonics and the cognitive processes of comprehension (Kamil & Hiebert, in press). The issue to address next, then, is just how many words do students need to know so as to read with comprehension? This is exactly what constitutes an "extensive" vocabulary.

How Many Words Do Students Need to Know?

Over the years, estimates of student vocabulary size have varied greatly, hindered in part by issues such as the types of vocabularies being considered (e.g., receptive/ productive or oral/print). Depending on how they approached such issues, early vocabulary researchers reported figures ranging from 2,500 to 26,000 words in the vocabularies of typical grade 1 students and from 19,000 to 200,000 words for college graduate students (Beck & McKeown, 1991). As researchers began to define more clearly what they meant by vocabulary size, the estimates became more precise. At the present time, there is considerable consensus among researchers that students add approximately 2,000 to 3,500 distinct words yearly to their reading vocabularies (Anderson & Nagy, 1992; Anglin, 1993; Beck & McKeown, 1991; White et al., 1990).

Perhaps a more useful way to approach the issue of vocabulary size is to consider the number of different, or unique, words in the typical texts that students read in schools. But this approach also raises questions. For example, what counts as a unique word? Is the possessive form of a word different from the original word and therefore unique? Can it be assumed that a student who knows

the word *laugh* also knows the words *laughed*, *laughing*, and *laughter*? Drawing on a database of more than 5 million words taken from a sample of school texts used in grades 3 through 9, Nagy and Anderson (1984) grouped unique words into families. The students' knowledge of the root word would help them determine a related word's meaning when they encounter that word in a text. To be included in a family, the relationship of a word had to be "semantically transparent." That is, the meaning of the related word can be determined by using knowledge of its root word and the context of text. Therefore, words within a family related to the root *laugh* can include *laughed*, *laughing*, and *laughter* but not *laughingstock*. Based on this definition, Nagy and Anderson estimated that school texts from grades 3 through 9 contain approximately 88,500 distinct word families. Clearly, acquiring meanings for this many words is a formidable task.

Yet somehow most students *do* steadily acquire a large number of new words each school year. To understand the magnitude of this accomplishment, consider what learning this number of words would require in terms of instruction. To directly teach students even 3,000 words a year would mean teaching approximately 17 words each school *day* (e.g., 3,000 words/180 school days). Estimates vary, but reviews of classroom intervention studies suggest that, in general, no more than 8 to 10 words can be taught effectively *each week*. This means no more than approximately 400 words can be taught in a year (Stahl & Fairbanks, 1986). Using a simple calculation, $3,000 - 400 = 2,600$, produces the conclusion that students must find ways other than direct classroom instruction to learn words.

So how do students acquire so many new words? An extensive body of research indicates that the answer is through *incidental learning* – that is, through exposure to and interaction with increasingly complex and rich oral language and by encountering lots of new words in text, either through their own reading or by being read to (National Reading Panel, 2000). However, such incidental encounters cannot ensure that students will acquire in-depth meanings of specific words (Fukink & de Glopper, 1998). For some words, such as those that are crucial for understanding a literature selection or a content area concept, most students need to have *intentional* and *explicit* instruction. We discuss each of these ways to acquire vocabulary in later sections. First, however, we examine what "knowing" a word means.

What Does It Mean to "Know" a Word?

Establishing exactly what it means to know a word is no easy task. Is "knowing" a word being able to recognize what it looks and sounds like? Is it being able to give the word's dictionary definition? Research suggests that, in general, the answer to these questions is *no*. Knowing a word by sight and sound and knowing its dictionary definition are not the same as knowing how to use the word correctly and understanding it when it is heard or seen in various contexts (Miller & Gildea, 1987).

Acquiring "Ownership" of Words

Here is how the process of acquiring word knowledge appears to occur, based on the research of Nagy, Anderson, and Herman (1987). Developing understandings of word meanings is a long-term process, one that involves many encounters with both spoken and written words in varying contexts. Here's how one group of researchers describes this process: On the first encounter with a new word, a student stores in memory some information about how the word fits into what he is reading. This information is reinforced each time he sees or hears the word. With each new encounter, the student picks up more information about the word from its use in various contexts. As a result, the student gradually acquires "ownership" of the word.

Nagy and Scott (2000) identify several dimensions that describe the complexity of what it means to know a word. First, word knowledge is *incremental*, which means that readers need to have many exposures to a word in different contexts before they "know" it. Second, word knowledge is

multidimensional. This is because many words have multiple meanings (e.g., *sage*: a wise person; an herb) and serve different functions in different sentences, texts, and even conversations. Third, word knowledge is *interrelated* in that knowledge of one word (e.g., *urban*) connects to knowledge of other words (e.g., *suburban*, *urbanite*, *urbane*).

What all of this means is that “knowing” a word is a matter of degree rather than an all-or-nothing proposition (Beck & McKeown, 1991; Nagy & Scott, 2000). The degrees of knowing a word are reflected in the precision with which we use a word, how quickly we understand a word, and how well we understand and use words in different modes (e.g., receptive, productive) and for different purposes (e.g., formal vs. informal occasions).

Knowing a word also implies knowing how that word relates to other knowledge (sometimes called *word schema*). The more we know about a specific concept, for example, the more words we bring to our understanding of that concept. Because we have individual interests and backgrounds, each of us brings different words to shape that understanding.

Finally, knowing a word means being able to appreciate its connotations and subtleties. When we know a word at this level, we can use and recognize it in idioms, jokes, slang, and puns (Johnson, Johnson, & Schlicting, 2004).

What’s a Word Schema?

A word *schema* is a network of knowledge related to a word (Nagy & Scott, 1990). Word schemas involve both semantic knowledge about the connections of word meanings to specific concepts and linguistic knowledge about words, such as their roots and their relationships to other words with the same roots. Here is an example.

Ramona is four years old. Already she has a fairly large schema for many simple concepts. For example, to her, the word dog includes knowledge about the general concept of “dog” as an animal, knowledge of one or two kinds of dogs, such as her Lab, Gus, and her neighbor’s poodle, Misty. It also includes specific information about Gus, such as the sounds he makes, and how he uses his legs when he runs and walks. As a result, the word dog can activate many other words for Ramona to use to talk about dogs. As Ramona grows older, she might add “dog” knowledge that ranges from the names of famous dogs in books, movies, and TV shows to how to train a dog, to the names for parts of a dog’s anatomy. She might also learn that the word dog can mean more than an animal and be able to use the word in expressions such as “I’ll dog you until you do what I told you to,” “that was a dog of a movie,” or “I’m dog tired.”

Ramona has also learned that words with similar word parts can have shared meanings, although she is also aware that what seems like a root word may be something altogether different. Thus, when Ramona encounters *dog-eared*, *dogpaddle*, and *doggedly* in texts, she examines the context of their use to see if their meaning is associated with the appearance or actions of dogs.

Instruction for Vocabulary Development

Over the past two decades, research has revealed a great deal about the kind of vocabulary instruction that is most effective for helping students comprehend what they read (e.g., Baumann, Kame’enui et al., 2003; Beck & McKeown, 1991; Blachowicz & Fisher, 2000; Nagy & Scott, 2000). Based on its analysis of this research, the National Reading Panel (2000) concluded that no one single instructional method is sufficient for optimal vocabulary learning; therefore, effective instruction must use a variety of methods to help students acquire new words and increase the depth of their word knowledge over time. Effective instruction includes opportunities for both incidental word learning and intentional word teaching.

**What the National Reading Panel Says About the Role of Vocabulary in Reading Instruction
(Reprinted from National Reading Panel, 2000, p. 4-4)**

1. There is a need for direct instruction of vocabulary items required for a specific text.
2. Repetition and multiple exposure to vocabulary items are important. Students should be given items that will be likely to appear in many contexts.
3. Learning in rich contexts is valuable for vocabulary learning. Vocabulary words should be those that the learner will find useful in many contexts. When vocabulary items are derived from content learning materials, the learner will be better equipped to deal with specific reading matter in content areas.
4. Vocabulary tasks should be restructured as necessary. It is important to be certain that students fully understand what is asked of them in the context of reading, rather than focusing only on the words to be learned. Restructuring seems to be most effective for lowachieving or at-risk students
5. Vocabulary learning is effective when it entails active engagement in learning tasks.
6. Computer technology can be used effectively to help teach vocabulary.
7. Vocabulary can be acquired through incidental learning. Much of a student's vocabulary will have to be learned in the course of doing things other than explicit vocabulary learning. Repetition, richness of context, and motivation may also add to the efficacy of incidental learning of vocabulary.
8. Dependence on a single vocabulary instruction method will not result in optimal learning. A variety of methods was used effectively with emphasis on multimedia aspects of learning, richness of context in which words are to be learned, and the number of exposures to words that learners receive.

Incidental Word Learning

As we noted earlier, research indicates that most word learning occurs incidentally through experiences with oral language and wide reading (National Reading Panel, 2000). Although this learning is called *incidental*, children's opportunities for word learning often reflect conscious choices on the parts of parents, family members, and teachers to use language in ways that invite children to ask and answer questions and to hear and read words that expand their vocabularies.

Incidental Word Learning Through Teacher Read-Alouds

Some researchers contend that the real value of reading aloud activities for vocabulary growth lies not in the reading alone, but in the teacher-student talk that accompanies the reading. The value of talk around book reading lies in the way it can promote students' familiarity with new, or rare, words (Dickinson & Smith, 1994). Beck and McKeown (2001) emphasize that it is through the talk surrounding read-aloud activities that students gain experience with "decontextualized" book language – that is, the language that represents ideas and concepts.

Talking About Books (McKeown & Beck, 2003)

Developed by Beck and McKeown (2001; McKeown & Beck, 2003), Text Talk is designed to increase both comprehension and vocabulary by incorporating word learning in the context of reading new books. Here's how one teacher used Text Talk to introduce the word *absurd* as part of their introduction to Tim Egan's *Burnt Toast on Davenport Street*:

(In the story, a fly tells Arthur he can have three wishes if he didn't kill him. Arthur says that it's absurd to think a fly can grant wishes.)

Teacher: If I told you that I was going to stand on my head to teach you, that would be absurd. If someone told you that dogs could fly, that would be absurd.

I'll say some things, and if you think they are absurd, say: "That's absurd!" If you think they are not absurd, say: "That makes sense."

I have a singing cow for a pet. (*absurd*)

I saw a tall building that was made of green cheese. (*absurd*)

Last night I watched a movie on TV. (*makes sense*)

This morning I saw some birds flying around the sky. (*makes sense*)

Who can think of an absurd idea? (When a child answers, ask other children if they think the idea is absurd, and if so, to tell the first child: "That's absurd!")

Beck and McKeown (2001) report that Text Talk has proved successful in helping students retain new words and recognize them in later reading.

Incidental Word Learning Through Wide Reading

A number of researchers have found that once students are reading on their own, the amount of time they spend reading is one of the best predictors of their vocabulary size (e.g., Herman, Anderson, Pearson, & Nagy, 1987; Miller & Gildea, 1987). Cunningham and Stanovich (1991) found, for example, that that even after accounting for general intelligence and decoding ability, reading volume (amount of time spent reading) contributed significantly and independently to vocabulary knowledge for students in grades 4, 5, and 6. Cunningham and Stanovich (1998) argue further that if most vocabulary is acquired incidentally, then the only opportunities for students to acquire new word meanings occur when they are exposed to new words in written or oral language that is outside their existing vocabulary. Given the findings of Hayes and Ahrens (1988) about the frequency of rare words in printed materials as compared to oral language, it is evident that this exposure to new words will happen more often as a result of reading rather than of engaging in most kinds of oral language activities.

Beyond providing exposure to a range of new and unfamiliar words, reading widely contributes to vocabulary growth by offering students opportunities to make connections among familiar words and unfamiliar but semantically related words – word families. As part of the study we mentioned earlier, Nagy and Anderson (1984) found that of the 10,000 or so “new” words that grade 5 students encounter in their reading, some 4,000 are derivatives of familiar words; that is, compound words and words with suffixes or prefixes, and another 1,300 are inflections of familiar words.

How Wide Reading Can Aid Vocabulary Growth (Stahl, 1999)

Much of a student's annual growth in reading can come from incidental learning.

- If Jacob, a grade 5 student, reads for one hour each day, five days a week (both in and out of school), at a fairly conservative rate of 150 words per minute, he will encounter 2,250,000 words in his reading over a school year.
- If 2 to 5 percent of the words Jacob encounters are unknown to him, he will encounter from 45,000 to 112,500 unknown words.

- If, as research has shown, students can learn between 5 and 10 percent of previously unknown words from a single reading, Jacob will learn, at minimum, 2,250 new words each year from his reading.

The Kinds of Reading Necessary to Produce Vocabulary Growth. Some researchers suggest that almost any reading will produce vocabulary growth (Krashen, 1993). Others contend that, if students consistently select texts below their current reading levels, even wide reading won't result in measurable vocabulary growth (Carver, 1994). Nor is reading text that is full of unfamiliar words likely to produce large gains in word knowledge (Shefelbine, 1990). For students to get the most out of wide reading, the conclusion of most researchers is that they should read for various purposes and read texts at various levels of difficulty. Students should read some text simply for enjoyment and some text that challenges them (see National Reading Panel, 2000).

Researchers who have observed students reading independently in classrooms also suggest that teacher guidance to students in selecting books can make independent reading periods productive. Teachers can direct students to books at appropriate reading levels and point out books that might be of interest to individual students (Anderson, 1996). In addition, setting aside time for students to talk with each other about what they read can contribute to the effectiveness of independent reading time (Anderson, 1996).

As is true for any method of promoting vocabulary growth, wide reading has some limitations. One limitation is that, although wide reading may be effective in producing general vocabulary growth, it may not be an effective method for teaching the specific words that students need to comprehend a particular literature selection or a particular content area textbook. Another limitation is that wide reading alone cannot ensure that students develop the kind of word-learning strategies they need to become independent word learners. For these kinds of word learning, many students require intentional, explicit instruction.

Intentional, Explicit Instruction

Research indicates that the intentional, explicit teaching of specific words and word-learning strategies can both add words to students' vocabularies (see Tomeson & Aarnoutse, 1998; White et al., 1990) and improve reading comprehension of texts containing those words (see McKeown, Beck, Omanson, & Pople, 1985; Stahl & Fairbanks, 1986). Whereas intentional instruction can benefit all students, it is especially important for students who have not developed the decoding and comprehension skills necessary for wide reading. For these students in particular, intentional, explicit teaching of specific word meanings and of word-learning strategies is especially important (National Reading Panel, 2000).

Specific word instruction refers to vocabulary instruction that enables students to develop in-depth knowledge of important words – that is, to know words well enough to access information about them from memory as they read. The question often posed by teachers is *which* specific words should be taught?

Choosing Words for Instruction

The question of which specific words to teach has no simple – or widely agreed upon – answer. Many teachers turn to the teacher's editions that accompany their comprehensive reading programs. Virtually all of these teacher's editions include lists of words deemed important for each selection in the program, along with activities for teaching those words. Based on analyses of such lists, however, Hiebert (in press) suggests that many of the recommendations are very rare words – those that can be expected to occur once or fewer times in a million words of school texts.

As we've discussed, the children's trade books that students hear and read contain many rare words. In a comprehensive reading program, however, the words targeted for direct instruction often are so *rare* they are unlikely to occur again in the texts students read over a school year – including texts

that are part of the reading program. Further, many of the targeted words may occur only once in the particular selection that students are reading.

In addition, the teacher's editions of comprehensive reading programs often ignore words that *are* used commonly in texts but have different meanings in discussions of different subjects, such as *volume* (science: a measurement of a space; music: degree of loudness; literature: one book in a set of books); *solution* (social studies: the answer to a problem; science: one substance dissolved in another); and *meter* (literature: poetic rhythm; mathematics: a unit of length; science: a device for measuring flow). Some students will need help with such words because they aren't aware of subject-specific differences.

To assist teachers in making word-choice decisions, researchers have proposed several criteria (see Beck, McKeown, & Kucan, 2002; Biemiller & Slonim, 2001; Hiebert, in press; Nation, 2001). In general terms, these criteria focus on two major considerations:

- Words that are important to understanding a specific reading selection or concept.
- Words that are generally useful for students to know and are likely to encounter with some frequency in their reading.

Why Not Teach All Unknown Words in a Text? (Armbruster, Lehr, & Osborn, 2001)

- The text may have a great many words that are unknown to students – too many for direct instruction.
- Direct vocabulary instruction can take a lot of class time – time that teachers might better spend having students read.
- Students may be able to understand a text without knowing the meaning of every word in the text.
- Students need opportunities to use word-learning strategies to independently learn the meanings of unknown words.

Importance. Words serve different purposes in language. Function words are words that cue a reader or speaker to the structure of the sentence: *are, that, a, to, or, the, of,* and so forth. Function words make spoken language meaningful and written language coherent and readable. Content words are the words that communicate meaning in text (Stahl & Nagy, 2000). Clearly, students must know both kinds of words to understand what they read. Fortunately, the number of function words in English is fairly limited – 107 words have been found to account for approximately 50 percent of the total words in texts (Zeno, Ivens, Millard, & Duvvuri, 1995) – and most students learn these words as part of their oral language development. Therefore, beyond beginning reading, these words are not good candidates for intentional instruction (Kamil & Hiebert, in press). Unfortunately (for instructional purposes), the number of content words is virtually unlimited. Because of this, the second criterion for word selection, the usefulness of a word – the frequency with which it is likely to appear in text – must be considered.

Usefulness and Frequency. Beck et al. (2002) propose that teachers should place major consideration on words' usefulness and frequency of use. To help in this endeavor, they categorized words into three tiers:

- Tier One consists of words such as *clock, baby,* and *happy* whose meanings students are likely to know.
- Tier Two is made up of words such as *fortunate, maintain,* and *merchant* that are "likely to appear frequently in a wide variety of texts and in the written and oral language of mature language users" (2002, p. 16), but whose meanings students are less likely to know.

- Tier Three is made up of words such as *irksome*, *pallet*, and *retinue* that appear in text rarely. Although these rare words are often unknown to students, their appearance in texts is limited to one or two occurrences, and because they are often specific to particular content, students can use the context of texts to establish their meaning.

Beck et al. (2002) suggest that for instructional purposes, teachers should ignore Tier One and Tier Three words and concentrate on Tier Two words. Their argument is that most students already know Tier One words and that Tier Three words should be taught at point of contact, or as they occur in reading. Tier Two words, however, appear often in student texts, so they are the words that can add most to students' language knowledge.

Tier Two words include: (1) words that are characteristic of mature language users and appear frequently across a variety of contexts; (2) words that lend themselves to instruction and that can be worked with in a variety of ways so that students can build in-depth knowledge of them and their connections to other words and concepts; and (3) words that provide precision and specificity in describing a concept for which the students already have a general understanding (Beck et al., 2002).

Teachers can identify Tier Two words by deciding whether their students already have ways to express the concepts represented by the new words. Beck et al. (2002) propose that teachers ask themselves whether their students will be able to explain the new words by using words they already know. If so, this suggests that the new words offer students more precise or sophisticated ways of referring to concepts they already know something about.

Guidelines such as these are useful, but in the complex and diverse settings that are American classrooms, they need to be applied with sensitivity to the needs of students. Further, it should be remembered that the Three Tier model assumes that students are fluent readers of Tier One words. As is evident in studies of students' fluency, however, such fluency cannot be assumed (Pinnell et al., 1995). When students are not fluent with Tier One words, using context to figure out Tier Three words will be difficult.

Some Criteria for Identifying Tier Two Words (Beck et al., 2002, p. 19)

- **Importance and Utility:** Words that are characteristic of mature language users and appear frequently across a variety of domains.
- **Instructional Potential:** Words that can be worked with in a variety of ways so that students can build deep knowledge of them and of their connections to other words and concepts.
- **Conceptual Understanding:** Words for which students understand the general concept but provide precision and specificity in describing the concept.

Teaching Specific Words

Research suggests many different methods for teaching specific words related to specific texts as well as specific sets of words related to particular topics. Graves (2000) identifies three types of word-learning tasks facing students:

- Words that are synonyms for words that students already know;
- Words that students know at some level but that have multiple meanings, such as *attention*, *channel*, and *practice*; and
- Words that represent concepts that may be new to students, such as *liberty*, *biome*, and *probability*.

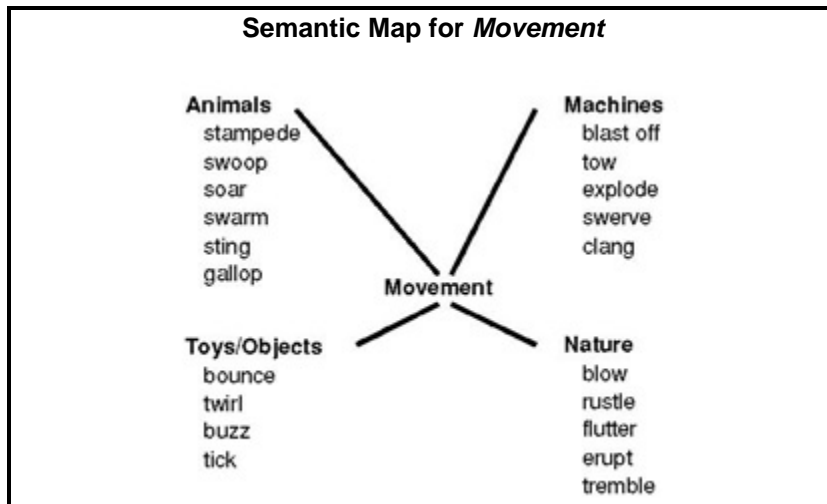
For each type of learning task, we highlight an instructional strategy from the many that are available (see Graves et al., 2004; Stahl, 1999). These strategies are simply examples; an instructional strategy is not limited to a particular type of task. In effective instruction, teachers employ a variety of strategies.

Teaching Unknown Words: Synonyms. Connecting important selection words to familiar synonyms before students read can be an efficient and minimally disruptive way to help them get the most from reading. Teachers can provide this instruction economically by writing on the board sentences that contain the target words and providing quick definitions that use synonyms students are likely to know. For example, for the word *benevolent*, the teacher might write, “The benevolent king was loved by his people.” Then she can either give a simple definition for *benevolent* (“kind”) or ask students to determine the meaning from the context of the sentence. Such activities can give students the background they need to understand the word when they see it in the text (Graves et al., 2004).

Teachers also can use synonyms as part of point-of-contact teaching for particular words as students are reading. For example, if a teacher notices that students seem puzzled by a word in a passage, he can quickly say, for example, “benevolent means kind” and move on. If necessary, the teacher might expand the definition, but not to the extent that it disrupts the flow of the reading.

Teaching Multiple-Meaning Words: Semantic Maps. Semantic maps can be an effective means to expand students’ knowledge of words with which they are already familiar but which have multiple meanings or are part of an extensive network of related words (Johnson & Pearson, 1984; Pittelman, Heimlich, Berglund, & French, 1991).

A semantic map is a graphic organizer that is organized around a word that represents an important concept (e.g., *movement*). On the map, related words are clustered around the target word according to criteria that teachers or students choose. These criteria might include such features as similar or dissimilar attributes, connotative or denotative meanings, or even shared linguistic components.



Teaching Words for New and Complex Concepts. One method for teaching words for new and complex concepts focuses on having students identify critical attributes associated with a word (Frayer, Frederick, & Klausmeier, 1969). Teachers lead students in a discussion where they compare and contrast essential features and examples of a concept. For example, an essential feature of a

globe is that it is a sphere or ball-like and not flat. An example of a globe is a globe of the earth. A map is not an example of a globe because maps are flat.

Students can identify features and examples for a concept after a teacher-led discussion. This activity can be aided with a visual representation, such as a four-square concept map (Eeds & Cockrum, 1985). The example below is for a Social Studies lesson on Citizenship for grades 4 or 5. In the upper right square, examples of the word, such as *following rules and laws* or *taking care of the environment*, are written. In the lower right square, non-examples of citizenship are identified, such as *not letting other people express their feelings* or *speeding or littering*. The upper left square is the space for writing a definition, while in the lower left square, statements of what the concept is not are written. A completed box might look like this:

Four-Square Concept Map for Citizenship

	Essential Features	Example
Yes	Carrying out actions that show awareness of how personal actions affect others in the community.	Following rules and laws.
		Taking care of the environment.
No	Being popular.	Not letting other people express their ideas.
	Getting other people to think just like you do.	Speeding or littering.

Teaching Independent Word-Learning Strategies

Graves (2000) notes that if students are to be successful in understanding unfamiliar vocabulary in their reading, they need to learn *about* words not simply acquire new words. Instruction that supports independent word-learning strategies guides students in how to go about determining the meanings of unknown words.

Independent word-learning strategies are procedures that teachers can model and teach explicitly to students to show them how to go about determining the meanings of unknown words (Baker, Simmons, & Kameenui, 1998).

Generative Word Knowledge

Independent word-learning strategies support a *generative* knowledge of words that transfers and enhances students' learning of words in addition to the specific words that are the focus of instruction.

Several researchers have found that directly teaching wordlearning strategies can help students become better independent word learners (Baumann, Edwards, Boland, Olejnik, & Kame'enui, 2003; Blachowicz & Fisher, 2000; National Reading Panel, 2000). The effective word-learning strategies they have identified include how to use dictionaries, how to identify and use context clues, and how to use word-part information (morphological analysis).

Using Dictionaries. Instruction in dictionary use that simply has students look up words and write definitions seldom produces indepth word knowledge (Scott & Nagy, 1997). This is not to say that dictionaries are not important aids to word learning. It means that instruction must show students *how to use* the definitions they find in a dictionary. Effective dictionary instruction includes teacher modeling of how most effectively to look up an unknown word and thinking aloud about how to select which is the most appropriate definition for a particular context (Graves, et al., 2004).

Using Dictionaries and Other Reference Aids: An Example of Classroom Instruction (Armbruster et al., 2001, p.38)

As students read a text, a grade 2 teacher discovers that many of his students don't know the meaning of the word *board*, as in the sentence, "The children were waiting to *board* the

buses.” The teacher demonstrates how to find *board* in the classroom dictionary, showing students that there are four different definitions for the word. He reads the definitions one at a time, and the class discusses whether each definition would fit the context of the sentence. The students easily eliminate the inappropriate definitions of *board*, and settle on the definition, “to get on a train, an airplane, a bus, or a ship.”

The teacher next has students substitute the most likely definition for *board* in the original sentence to verify that it is “The children were waiting *to get on* the buses” that makes the best sense.

Identifying and Using Context Clues. Context clues are clues to the meaning of a word that are contained in the text and illustrations that surround it. Context clues can include definitions, examples, and restatements, as well as charts, pictures, and type features. In one study, middle school students who were taught to identify and use specific types of both linguistic information (words, phrases, sentences) and nonlinguistic information (illustrations, typographic features) were then able to use this information to unlock the meanings of unfamiliar words in text (Baumann, Edwards, et al., 2003).

Not all contexts are helpful. In some cases, the context can be of little assistance in directing readers toward the specific meaning of a word. Beck, McKeown, and McCaslin (1983) called these “nondirective contexts.” Here’s an example of such a context: “We heard the back door open, and then recognized the *buoyant* footsteps of Uncle Larry.” The context for *buoyant* is unhelpful because a number of possible meanings could fit the word, including *heavy*, *lively*, *noisy*, *familiar*, *dragging*, and *plodding*. Another example of a nondirective context is “The police arrived to arrest him for the *dastardly* deed of bringing donuts and coffee to the homeless people in the park.” Here the context is misleading because *dastardly* is used sardonically. Therefore, the context offers no clue to help determine its meaning.

Using Context Clues: An Example of Classroom Instruction (Armbruster et al., 2001)

In a grade 3 class, the teacher models how to use context clues to determine word meanings as follows:

Student (*reading the text*):

When the cat pounced on the dog, the dog jumped up, yelping, and knocked over a lamp, which crashed to the floor. The animals ran past Tonia, tripping her. She fell to the floor and began sobbing. Tonia’s brother Felix yelled at the animals to stop. As the noise and confusion mounted, Mother hollered upstairs, “What’s all that commotion?”

Teacher:

The context of the paragraph helps us determine what commotion means. There’s yelping and crashing, sobbing and yelling. And then the last sentence says, “as the *noise* and *confusion* mounted.” The author’s use of the words *noise* and *confusion* gives us a very strong clue as to what *commotion* means. In fact, the author is really giving us a definition there, because *commotion* means something that’s noisy and confusing – a disturbance. Mother was right; there was definitely a *commotion*!

Using Word-Part Clues/Morphology. *Morpheme* is the name for meaningful word parts that readers can identify and put together to determine the meaning of an unfamiliar word. Knowledge of morphemes and morphology, or word structure, plays a valuable role in word learning from context, because readers can use such knowledge to examine unfamiliar words and figure out their meanings (Carlisle, 2004).

It is estimated that more than 60 percent of the new words that readers encounter have easily identifiable morphological structure – that is, they can be broken into parts (Nagy, Anderson, Schommer, Scott, & Stallman, 1989). Researchers have focused considerable attention on the value of teaching roots, prefixes, and suffixes for purposes of vocabulary development.

More About Morphemes and Morphology

A *morpheme* is a linguistic element of meaning that cannot be divided into smaller meaningful parts. For example, words such as *brave* and *stone* are morphemes, as are word parts such as *-ly*, as found in *bravely*, and *-s*, as found in *stones*.

Morphology is the study of word formation, including the origin and function of inflections, or changes made to words to show such things as tense, case, or number (e.g., *looked*, *looking*, and *looks* from *look*) and derivatives, or words that are formed from other words (e.g., *sadly* and *sadness* from *sad*).

Root Words. The Nagy and Anderson (1984) analysis of printed school English made clear that a large number of words that students encounter in reading are derivatives or inflections of familiar root words. Several researchers have argued, in fact, that focusing vocabulary instruction on acquiring root words is an effective way to address the large number of words that students must learn each year (e.g., Anglin, 1993; Biemiller & Slonim, 2001). One researcher suggests that students acquire about 1,200 root word meanings a year during the elementary school years (Anglin, 1993). Other researchers place that number at about 600 root word meanings per year from infancy to the end of elementary school (Biemiller & Slonim, 2001).

Prefixes and Suffixes. The presence of a prefix at the beginning of a word requires that a reader attend to it immediately. Fortunately, a relatively small number of prefixes are used in a large number of words. Indeed, nine prefixes account for 75 percent of words with prefixes (White, Sowell, & Yanigihara, 1989). Further, prefixes tend to be spelled consistently and have a clear lexical meaning, which makes prefix instruction and learning at grades 3 through 5 both fairly straightforward and useful.

Although there is general agreement on the value of teaching prefixes, there is less agreement on the value of teaching suffixes. Stahl (1999) contends, for example, that because many suffixes have vague or unhelpful meanings, they can often confuse more than help students. Learning that *-ious* means “state or quality of” may not help students learn the meanings or much about words such as *ambitious* or *gracious*. Some suffixes, such as *-less* (“without”) and *-ful* (“full of”), are more “stable,” or obvious, in meaning and thus easy for students to understand and apply to words.

The most frequently occurring suffixes in printed school English are inflectional endings such as *-s*, *-es*, *-ed*, *-ing*, *-en*, *-er*, and *-est*. Most young students use these endings in their oral language and so should have few problems learning and using them (although they may pose problems for ELL students). Derivational suffixes such as *-y*, *-ly*, *-ial*, and *-ic* appear in fewer than 25 percent of all the words that contain suffixes, but they also can be useful to teach. For example, knowing the meanings of the *-ial* (“relating to”) and *-y* (“being” or “having”) suffixes can aid in figuring out rare words such as *exponential* and *unwieldy* (White et al., 1989).

To be most effective, word-part instruction should teach students the meanings of particular word parts as well as a strategy for when and why to use them. In a project where fifth graders became

more adept at using word parts within new words, teachers taught word parts through a four-step lesson (Baumann, Edwards, et al., 2003). The successful instruction did not require students to recite the meanings of word parts they encountered. Rather, it involved having them read texts with words that use the word parts and gave them opportunities to learn about word origins, derivations, and usage. Such a slant toward words can stir students' interest in learning more about language and building word consciousness.

Developing Word Consciousness

Word consciousness is an awareness of and interest in words, their meanings, and their power (Anderson & Nagy, 1992; Nagy & Scott, 2000; Graves & Watts-Taffe, 2002). Word consciousness involves knowing that some words and phrases can simultaneously feel good on the tongue and sound good to the ear. Students who are word conscious enjoy words and are eager to learn new words. Curiosity about words includes learning the histories of words such as knowing that words have come into English from many different languages including Hindi (e.g., *dungaree*, *pundit*, *juggernaut*, *khaki*), Russian (e.g., *tundra*, *sputnik*), and Chinese (e.g., *typhoon*, *kowtow*), as well as from the better known sources of Latin and Greek.

Word consciousness also means learning about the ways in which words are used figuratively such as *idioms* (e.g., *on the same boat*, *get ahead of one's self*) and learning the pleasures of playing with words. Word play – jokes, puns, riddles, tongue twisters, and so forth – is critical to the vocabulary development of all students but especially for ELLs who often focus on the literal meanings of words.

Through activities such as Hink Pinks that use rhyming words (e.g., *an impertinent young man is a rude dude*) or homophones (e.g., *define a flower flour or a brake break*), students can play with words and understand underlying concepts. Teachers have available any number of books (e.g., Espy, 1982; Johnson, 1999) that can be used for a host of inventive and diverse word play activities. In addition, they can access numerous websites that contain word games, identify words that are new to English (e.g., *blog*) focus on Latin and Greek elements in English, and have rhyming dictionaries.

Conclusion

The strong and established relationship between students' vocabulary knowledge and their ability to successfully comprehend what they read places a heavy demand on classroom teachers, curriculum planners, program developers, organizers of staff development plans, reading researchers, and on parent outreach programs. The demand is that significant attention be given to the development of students' vocabulary knowledge. Much is known from research about how young children acquire words and how they learn to use them in spoken language.

Much is also known about the differences in the amount of vocabulary knowledge that young children bring to school, and the negative impact of what one researcher calls "word poverty" (Moats, 2001) on the acquisition and maintenance of reading competence. It is clear that rich oral language environments must be created in preschool and kindergarten classrooms to promote the development of school- and book-related vocabulary.

As students progress through the grades, the development of their vocabulary knowledge must remain a priority. Attention to vocabulary development is important for all students, but is especially important for students who are at-risk for learning to read and those who are ELLs.

In summary, we know a lot about vocabulary knowledge, its acquisition, and its importance across the school years. The challenge is to put what we know to work in the classrooms of American schools. The successful reading achievement of many of our students depends upon us doing so.

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