

Which Words Are Worth Teaching?

by Andrew Biemiller

Why teach vocabulary?

Vocabulary is the largest determinant of comprehension of language. Teachers often ask, “Which words make up that vocabulary for preschool, primary, and upper elementary school students?” “Which words are likely to be needed?” This article is about ways of teaching and fostering needed vocabulary at the preschool, primary, and upper elementary and middle school grades.

The vocabulary needed to comprehend a specific text consists of knowledge of *most* of the words in that text. Some word meanings are learned earlier than others. Thus, if most of the words in a text are known by most children by age 5, that text would be considered appropriate to read to kindergartners or to be read *by* beginning readers. Conversely, a text with many words not understood by the majority of children in grade 2 is not appropriate for primary grade children to read independently.

By kindergarten, the number of words known orally (i.e., vocabulary) is the strongest predictor of children’s reading comprehension when they reach the upper elementary grades (Scarborough, 2001). Cunningham and Stanovich (1997) extended those findings to high school. While there are variations in how quickly children acquire reading skills in the primary grades, by grade 3 for most students, *lack of vocabulary* is a far greater obstacle for comprehension than a lack of other reading skills such as phonics and word recognition. However, if a student’s reading is restricted by learning disabilities such as dyslexia, it can further limit vocabulary development.

How many word meanings are needed before and during the primary grades?

I refer to *word meanings* rather than *words*. Especially at the preschool and primary levels, specific word forms (e.g., *lean*, *place*) access a number of *meanings*; some meanings that are related and some that are not. Meanings that really differ (e.g., *lean* meat versus *lean* the rake on the wall) simply are different *root words* that have to be learned. On the other hand, words with different grammatical variations (e.g., *lean* versus *leaned*) are not different root word meanings.

I estimate that at the beginning of kindergarten, *average* children probably know around 3,000 (+/- 1000) *root word* meanings. In homes where many words are used and explained, children add vocabulary rapidly compared to children in homes where fewer words are used or explained (Hart & Risley, 1995; Hart & Risley, 1999; Hoff, 2003). It is also the case that younger students within a grade have smaller average vocabularies (Cantalini, 1987; Christian, Morrison, Frazier, & Massetti, 2000). By the end of grade 2, English-speaking children with the lowest (25%) vocabularies know on average around 4,000 *root word* meanings. Children with the largest vocabularies (highest 25%) know on average 8,000 *root word* meanings—**twice as many!** The average at the end of grade 2 is around

6,000 *root words*. Children add an average of 1,000 *root words* per year during the primary grades.

Sustaining Vocabulary Growth in the Upper Elementary and Middle School Grades

After grade 2, most children can and should acquire much of their new vocabulary from books they read. However, because children’s vocabulary already varies widely by third grade, the books they can benefit from also vary (Chall, Jacobs, & Baldwin, 1990). Teachers should encourage students in the upper elementary and middle school grades to attend to unfamiliar word meanings encountered while reading. Many students tend to skip over these, even when new meanings are explained in text (Baumann et al., 2003). Students continue to add an average of 1,000 new *root word* meanings during the upper elementary and middle school grades (Biemiller, 2005) and also come to understand four or five times more derived meanings using affixes (Anglin, 1993; Nagy & Scott, 2001).

Acquiring Vocabulary Is Different than Acquiring Skills

Once learned, many different skills such as swimming, cycling, word decoding, and adding or subtracting numbers can be used throughout life. However, becoming literate requires more than mastery of word reading skills. Children also need an adequate vocabulary. Unlike basic reading and math skills, acquiring an adequate vocabulary requires on-going support for many years. Young children clearly build vocabulary from the language used around them. However, the “language around them” varies dramatically for less advantaged versus more advantaged homes (Hart & Risley, 1995, 1999; Hoff, 2003).

Unfortunately, during the primary grades, disadvantaged children continue to fall further behind advantaged children in word meanings known (Biemiller & Slonim, 2001). Schools will have to take more responsibility to ensure adequate vocabulary development across the primary years if disadvantaged children are to break out of poverty and surmount linguistic barriers.

How do we determine which word meanings to teach?

One strategy is to find words that children with large vocabularies know and make a point of introducing these words to children with smaller vocabularies. Examples of these priority words for primary grade children are *positive* (sure), *disaster*, and *beyond*. This list of priority word meanings was included in *Words Worth Teaching* (Biemiller, 2010). To a considerable degree, children learn words in a predictable order (Biemiller, 2005; Biemiller & Slonim, 2001). Consider three children who know 8,000 *root words*—the average for fourth grade. One child is in second grade, another fourth grade, and another sixth. About 85% to 90% of the word meanings that these

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three children know are likely to be the same. Thus, these students have been learning mainly the same words at different rates. *Priority words* are thus word meanings that children with large vocabularies (for given ages) know but children with small vocabularies do not yet know. By the time these children learn such words, they are comprehending below grade level.

Another method of determining priority words can be based on the importance of words “of high utility for mature language users and are found across a variety of domains” (Beck, McKeown, & Kucan, 2013, p. 9). However, these authors do not provide a listing of the 7,000 words that they suggest fit this description. Still another method uses print frequency. However, among the more common words, there are many *homophones*—words with more than one meaning. Print frequency data ignores multiple meanings and can be misleading (Biemiller, Rosenstein, Sparks, Landauer, & Foltz, 2014).

The Preschool Period

These are not literate children—they cannot acquire new vocabulary through their own independent reading.

Important Word Meanings in the Preschool Period

Many of the words learned in the preschool years have *concrete meanings* (things that can be pointed to or acted out). People have typically spoken about “concrete” versus “symbolic” word meanings. However, young children also learn *relational meanings* from age 2 on. There are many function words that some children have learned by age 3, but many other children only learn later. These *relational* word meanings may be the most important for their later vocabulary development. Some examples of relational meanings follow:

- Function words that specify relationships include auxiliary verbs (*could, will*), conjunctions (*both*), prepositions and locations (*after, instead, inside*), pronouns (*whose*), quantifiers and articles (*all, enough*). I would also include interrogatives (*where, what*) and forms of the verb *to be*.
- Other words involving relations include nouns such as *aunt/niece, boss/worker*, verbs such as *balance, put*, and modifiers such as *big/small, good/bad, and quickly/slowly*.

Preschool children learn few, if any, true *symbolic* meanings. These are meanings that are defined in terms of other word meanings (e.g., *add, plan, science, history, divide*), rather than perceptual referents (e.g., real objects, settings, actions) or relational referents (e.g., prepositions, locations, pronouns).

Acquiring Word Meanings in the Preschool Period

Word meanings are probably best taught with concrete examples. As with later learned word meanings, they are learned in meaningful verbal contexts. Short stories and shorter contexts (paragraph-length passages) that illustrate words are

useful. Some of Richard Scarry’s “word books” illustrate shorter contexts, as do pattern books such as *The Hungry Caterpillar*. Preschool children usually want books read many times. Different words can be discussed on different readings. Neuman and Wright (2013) have many additional suggestions for the preschool period. For example, children learned to use words such as *compare, contrast, observe, and predict* in science instruction in Head Start programs for 4-year-old children. In another example with preschoolers, children learned words related to a semantic category, for example, *abdomen, lungs, heart, and brain* as “parts of the body.”

The Primary Period

Most children in the primary period are still preliterate—they cannot acquire much new vocabulary through their own reading, even if they can read some texts.

Important Word Meanings in the Primary Period

During the primary years, the majority of new meanings acquired are still concrete (Biemiller & Slonim, 2001). However, relational and symbolic meanings acquired in these grades may be more important for future vocabulary development.

Sustaining vocabulary growth is greatly needed during the primary grades (K–2) at 1,000 root word meanings per year or more. At present, most children with low vocabularies not only start kindergarten with fewer words, but also continue to build vocabulary more slowly during kindergarten, first grade, and second grade (Biemiller & Slonim, 2001; Cantalini, 1987; Christian, Morrison, Frazier, & Massetti, 2000). English language learners also lag in acquiring English vocabulary (Biemiller, 2005).

Many word meanings are learned during these grades. Some of these new meanings continue to be *concrete*—things or people you see and touch, or things you can do (e.g., *hammock, mechanic, to ride*). Other word meanings are less concrete, including *relational* meanings (e.g., *should, either, against, whatever, several*), and *symbolic* meanings (e.g., *avoid, business, community*). I suspect that these relational and symbolic meanings will be more important for teachers to teach or otherwise introduce. Acquiring these new relational and symbolic meanings may depend more on parent or teacher explanations. They certainly depend on whether such words are being used with the children.

My list of priority words in *Words Worth Teaching* includes some 1,600 meanings for introduction or use between kindergarten and grade 2. These are most of the *root* word meanings known by 40% to 80% of children at the end of grade 2. In addition, teachers may see other words in texts they suspect that children in their primary classes may need.

It is likely that most unknown “concrete” word meanings can either be inferred or illustrated in accompanying pictures. These concrete words refer to things that can be pointed to, or acted out. Priority *relational* meanings can often be illustrated as well, but the picture must include two or more objects or agents and a physical or temporal relationship. When not

known, these relational words should be taught. (Examples of relational words acquired in the primary grades include *after*, *opposite*, and *or*.) The non-picturable priority *symbolic* meanings are words that should often be taught (e.g., *add*, *plan*, *science*, *history*, *divide*). These symbolic meanings may include figurative terms such as a *time line* or *lean on* someone for emotional support.

Acquiring Word Meanings in the Primary Period

Primary children are still mainly preliterate. Until they become reasonably fluent with printed language, primary children can find unknown word meanings to be confusing. Children cannot know whether they've misread a familiar word or correctly read an unfamiliar word. If students are to consolidate their reading skills through practice, they should have reading texts with mostly familiar vocabulary, especially in kindergarten and first grade. However, this means that classrooms must include other sources of new vocabulary.

In the primary grades (K–2), new word meanings will still mostly come from oral sources such as stories read to children or from experiences such as field trips. Primary children typically cannot understand texts they read that are as advanced as texts they can understand when read to them (Sticht & James, 1984). Primary children also read many fewer words per year than students read in later grades.

To build new vocabulary, *orally re-reading* stories or other texts to children (or re-viewing digital/TV “texts”) is necessary. Too often oral reading is treated more as an entertainment, and stories are read only once. As teachers know, primary grade children generally welcome re-readings (within reason). In our experience, up to 8- to 10-word explanations can be used with each of the second and later re-readings (Biemiller & Boote, 2006). Children disliked interruptions on a first reading. Similarly, Dickinson and Smith (1994) reported that digressions during the first reading did not enhance language development. Further exploration of teaching word meanings *after* each reading rather than *during* readings would be worthwhile. This could be a somewhat easier instructional procedure to use in a classroom.

We also found that we could increase the number of words learned each week by reviewing word meanings after each reading with explanations and providing an additional review at the end of a week. In our experience, children in kindergarten, first grade, and second grade could acquire around 10 new word meanings per week, if roughly double that number of word meanings were taught in whole-class lessons. (Children do not know all the same word meanings. Thus, you need to find good contexts for—and teach—20 to 25 word meanings per week if children are to acquire 10 new meanings per week.) If children do acquire 10 word meanings per school week, they can acquire 300–400 new meanings per year. This addition of directly taught meanings should also facilitate the acquisition of more meanings by inference and “latent” meaning acquisition (Landauer & Dumais, 1997; Landauer, 2007). A number of studies have now demonstrated that continuing vocabulary instruction for half of a school year continues to lead to learning word meanings (review by Marulis & Neuman, 2010).

Acquiring Meanings in the Primary Period

Expanding vocabulary during kindergarten is a step in the right direction. However, unless vocabulary support is continued throughout the primary years, less advantaged children will not continue to add enough needed vocabulary in the rest of the primary years. It is likely that children who reach the end of the primary grades with what is now an average vocabulary and fluent reading skills, will be able to progress thereafter with normal classroom reading and classroom vocabulary instruction.

The Upper Elementary and Middle School Period

By this period, children acquire much of their new vocabulary through independent reading.

Important Word Meanings in the Upper Elementary and Middle School Grades

In grades 3 to 6, the priority words found in *Words Worth Teaching* are similar to many of Beck and colleagues' (2013) “Tier II” words, and also include many “Academic” words listed by Averil Coxhead (2006). Most of these meanings are *symbolic*. A small number are additional *relational* function words. Examples of *symbolic* meanings include *attitude* (a way of feeling, acting, or thinking), *document* (an important paper; or to give written proof—a different meaning), and *probability* (likely to happen). Examples of relational function words typically acquired in the upper elementary grades include *only* (except that), *through* (because of), and *while* (period of time). Note that these are new meanings of words previously encountered. In *Words Worth Teaching*, approximately 2,900 priority word meanings are listed for introduction or use between the third and sixth grades. Again, teachers will encounter other words that children in their classes may need. There are probably another 1,000 root word meanings that will be needed by grade 8, mainly from Coxhead's Academic Word List (2006).

Acquiring Meanings in the Upper Elementary and Middle School Periods

By the upper elementary and middle school grades, it may be sufficient for teachers to ensure the following:

1. priority words are used in narrative or expository texts;
2. students become skilled in identifying and learning meanings they don't know; and
3. teachers may identify other potential priority words by providing lists of such words appearing in class-assigned reading texts or taught as part of mathematics, science, or social studies curricula.

As much as possible, teachers should encourage students to take responsibility for actually finding meanings for unknown words. Ultimately, students will have to be able to do this in college and in work. However, teachers should continue to monitor vocabulary growth, just as they monitor growth in reading, spelling, punctuation, and computational skills.

When children can read words fluently (that is, reading known words correctly and quickly), the proportion of unknown

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word meanings can increase to 3 to 6% of words in texts read independently. However, the new word meanings should appear several times in texts, and they should be explained in various ways: classroom instruction, appositions (in-text explanations), glossaries, digital supports in texts, etc. Note that most of these techniques do not require direct instruction of each new word.

In the upper elementary grades, some concrete word meanings are still being learned (e.g., *chowder, gander, leprechaun*). However, new relational and symbolic word meanings again are probably both more difficult to learn and more important to learn (e.g., *through, nevertheless, annihilate, border, condense*). In a recent study, my colleagues and I have found that symbolic meanings require about twice as many encounters as concrete meanings to be acquired from print at the same age (Biemiller et al., 2014). However, it appears that by the upper elementary grades, children are acquiring twice as many new symbolic meanings as concrete meanings (Biemiller & Slonim, 2001). They are still acquiring an average of 1,000 new root word meanings each year.

Does the simple act of reading build vocabulary? To some extent, it does. However, in a study of grade 3 and 4 children who greatly increased their daily reading, some increased their vocabulary significantly over 16 weeks, while others showed no vocabulary gains (Shany & Biemiller, 2009). Consequently, it is important to emphasize that students become aware of unfamiliar word meanings and have students take responsibility to learn those unknown meanings. Students need to be alert to the fact that many *words* have more than one meaning.

In the upper elementary grades, children are usually taught more about both affixes and Latin and Greek word stems (e.g., *demo-, -tion*), as well as additional vocabulary in conjunction with science and social studies curricula. There is evidence that such instruction builds vocabulary and is applied to other known root words. (Baumann, Edwards, Boland, Olejnik, & Kame'enui, 2003). However, when root word meanings are not known, affix knowledge does not help with finding meanings (Bowers & Kirby, 2010).

Acquiring Word Meanings in the Upper Elementary and Middle School Grades

In these grades (3–8), literate students can take greater responsibility to identify and learn new word meanings. However, students can be directly taught more about using affixes and compounds and made more aware of multiple word meanings. Although there is less need to teach specific word meanings in grades 3–8, some word meanings that are critical for understanding a specific text should be taught directly. Teachers should monitor mastery of priority vocabulary growth.

To summarize, children with small vocabularies are less likely to be successful in the upper elementary grades and on through high school. They are less likely to be ready for post-secondary education or careers. Because vocabulary is a cumulative process, those with low vocabularies at the end of the primary grades are already at a major disadvantage, even if they have been mastering word identification reading skills and

early computational skills. Thus, addressing low vocabulary in preschool, primary grades, and beyond has proven to be the most effective approach to give students a fair opportunity for future academic achievement.

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