3

The Role of Vocabulary Instruction in Adult Basic Education

Mary E. Curtis

My goal in this chapter is to review theory and practice related to vocabulary learning in adult literacy learners and to draw some implications for research, policy, and practice. Vocabulary—the extent of one's knowledge of word meanings—has long been recognized as a key factor in reading comprehension (Davis, 1944). Vocabulary knowledge has also been identified as one of the most significant variables in the reading success of minority language learners (Fitzgerald, 1995). Given the central role of vocabulary in reading, along with the large percentage of English-language learners enrolled in ABE programs, it is surprising how few studies have focused on vocabulary acquisition and instruction in adult literacy learners.[1] However, a much more extensive body of work describes

[1] Among the nearly 900 journal articles listed in ERIC that deal with reading/literacy in adult basic education, only 24 (about 3%) focus on vocabulary. Such a small number does not necessarily indicate less awareness about the importance of vocabulary in ABE, as less than 4% of the articles about reading/literacy in secondary education focus on vocabulary. Similarities in relative emphasis aside, however, more than 400 journal articles have been published about vocabulary at the secondary level.

the vocabulary knowledge and skills of children and young adults, along with information about the factors that seem to influence vocabulary growth (e.g., see Baumann, Kame'enui, & Ash, 2003; National Reading Panel, 2000; RAND Reading Study Group, 2002). As a point of departure, therefore, I rely on this research to identify trends in theory, research, and vocabulary practices that hold promise for adult literacy learners.[2] For purposes of this discussion, unless otherwise noted, I use "adult literacy learners" to refer to all adults—those who are learning to read in their native language as well as those who are English-language learners.

THE LINK BETWEEN VOCABULARY AND COMPREHENSION

Vocabulary and reading comprehension are highly correlated (about r = .75 for 14-year-olds and r = .66 for 17-year-olds), making vocabulary among the best single predictors of comprehension (Thorndike, 1973). This finding is true for children and, although we have no empirical data to prove this, we can assume that it is true for adults as well. A variety of hypotheses have been offered to explain the correlation (e.g., see Anderson & Freebody, 1981; Mezynski, 1983; and Ruddell, 1994). Each explanation suggests a very different avenue for vocabulary instruction. In this first section, four of these hypotheses are introduced, and the potential relationships that exist among them during acquisition of reading skills are discussed. In the sections that follow, issues of how and what vocabulary should be taught are addressed in more detail.

Two of the hypotheses posit a causal relationship between vocabulary and comprehension. According to the first hypothesis, the extent of one's knowledge of word meanings directly affects how much is understood. Because vocabulary controls comprehension, to improve understanding it is necessary to increase the number of word meanings that are known. This hypothesis is often referred to as the *instrumental hypothesis* (Anderson & Freebody, 1981).

A second hypothesis contends that comprehension ability affects vocabulary size. The more opportunities provided for reading, the better one is at understanding what is read, and the better one is at understanding, the more likely new word meanings will be learned. In other words, improve-

[2] See Gillespie (2001) and Kruidenier (2002) for examples of how this approach has been used previously to inform overviews of adult literacy research and practice.

ment in vocabulary is a consequence—not a cause—of comprehension. I refer to this as the *byproduct hypothesis.* (See Ruddell, 1994, for a similar explanation—one she calls "a comprehension-process view.")

Two other hypotheses about the relationship between vocabulary and comprehension point to their link with a third factor. The first such hypothesis suggests that vocabulary and comprehension are correlated because both are connected to the extent of background knowledge a reader has about what is being read. Once a relevant knowledge base has been built, both vocabulary and comprehension will be improved. This is commonly known as the *knowledge hypothesis* (Anderson & Freebody, 1981).

According to a fourth hypothesis, vocabulary and comprehension are related because both reflect an individual's overall competence with language. As learners develop linguistically, their vocabulary and comprehension abilities improve. This I refer to as the *language proficiency hypothesis.* (See Stahl, 1999, for a description of a somewhat related view, one that accounts for the relationship between vocabulary and comprehension in terms of their relationship to "general ability," or intelligence.)

Hypotheses like these are important because one's view about the nature of the relationship between vocabulary and comprehension has implications for instruction. For instance, if the instrumental hypothesis is correct, comprehension should be improved by teaching word meanings. If any of the other hypotheses are correct, however, word-meaning instruction will not in itself improve comprehension. Instead, instruction focusing more directly on promoting linguistic knowledge and use (language proficiency hypothesis), or increasing topical knowledge (knowledge hypothesis), or providing opportunities for understanding (byproduct hypothesis) would improve reading.

Studies conducted with students in Grades K–12 support each of these hypotheses, leading the RAND Reading Study Group to conclude that:

> the relationship between vocabulary knowledge and comprehension is extremely complex, confounded as it is by the complexity of relationships among vocabulary knowledge, conceptual and cultural knowledge, and instructional opportunities. (RAND, 2002, p. 35)

Complex as the relationship may be, however, there is reason to believe that these hypotheses may be—to some extent, at least—developmentally related. That is, all of them may in fact be "true," but at different points in reading development.

Consider the situation for children just beginning to read. By the end of the primary grades, children can decode and understand about 3,000

words, although they recognize the meaning of about 9,000 words when heard (Chall, 1983). Young children who are learning to read are much better at listening comprehension than they are at reading comprehension. Moreover, at this age, the extent of oral language experience still has a sizeable impact on growth in knowledge of word meanings and ability to understand (Biemiller, 1999). For adults at this stage of reading development (learning to decode), the language proficiency hypothesis seems to be the best explanation for the correlation between vocabulary and comprehension.

Once children have learned to decode, the number of words that they can read and understand begins to affect directly their ability to comprehend (Beck, Perfetti, & McKeown, 1982; Chall, Jacobs, & Baldwin, 1990). At this point in reading development, vocabulary takes on a causal role in reading comprehension. To improve their comprehension ability, adults at this stage must acquire new vocabulary knowledge (i.e., the instrumental hypothesis).

By middle school, the extent to which children have been exposed to written language becomes a significant factor in their vocabulary growth (McBride-Chang, Manis, Seidenberg, Custodio, & Doi, 1993; Nagy, Anderson, & Herman, 1987). What has been comprehended as a result of wide and varied reading determines opportunities for incidental learning from context, a situation consistent with the byproduct hypothesis. Adults at this stage need to read many different types of text, and read more.

By adolescence, the conceptual knowledge readers have about topics has an increasingly greater influence on how well they understand and acquire new concepts from what they read (Bulgren, Deshler, Schumaker, & Lenz, 2000). As school-related content-area reading tasks increase, background knowledge assumes an increasingly important role in the ability to understand the link between vocabulary and comprehension (i.e., the knowledge hypothesis). Adults at this stage must use reading to learn.

In adult literacy learning research, less curiosity about the nature of the relationship between vocabulary and comprehension is apparent than in the K–12 literature. Even so, connections with each of the aforementioned hypotheses can be found. For instance, approaches to adult reading instruction that emphasize the use of personal experiences and listening, speaking, and writing (Taylor, 1992) would seem to be based on the language proficiency hypothesis.

The view that vocabulary enables comprehension (the instrumental hypothesis) seems to be the basis for recommendations that vocabulary

words should be taught to adult English-language learners "roughly in order of their frequency of occurrence, with high frequency words being learned first" (Laufer & Nation, 1999, p. 35).

Other second-language researchers such as Singleton (1999) argue that vocabulary is best taught not as knowledge of individual word meanings but through instruction in comprehension of the context in which word meanings are integrated (the byproduct hypothesis). Reading comprehension's impact on vocabulary growth may also help to explain why, by the time the fifth-grade reading level is reached, the extent of vocabulary knowledge of ABE students is no greater than children who read at the same level (Greenberg, Ehri, & Perin, 1997).

The notion that domain knowledge influences the ability to comprehend and acquire new vocabulary (the knowledge hypothesis) would seem to be the foundation for content-based approaches to literacy development in adults. According to Sticht (1997), for example, young adults in a remedial reading program who lacked knowledge relevant to what they were reading required an 11th-grade "general reading" ability to comprehend with 70% accuracy. However, when learners had high amounts of knowledge about what they were reading, they were able to comprehend with 70% accuracy with only sixth-grade "general reading" ability.

More research is needed to establish how the relationship between vocabulary and comprehension might differ in adults learning to read from the relationship for children learning to read, and whether the relationship changes for adults as reading ability develops. What is evident at present is that one's view about the nature of the relationship has significant implications for practice, affecting what the focus of vocabulary instruction will be, as well as what ultimately is learned. Research on these topics is examined in the next sections.

SOURCES OF VOCABULARY LEARNING

Although relatively little has been written about vocabulary learning for ABE students, several aspects of vocabulary have been suggested as important for instruction within the literatures on K–12 students and second-language learners. Three of these aspects have to do with sources of vocabulary learning. The first concerns the use of context—recognizing clues that signal the meaning of unknown words, as well as the words that can signal relationships among ideas in a text. A second aspect involves

the use of morphology—identifying word parts that can be used in making inferences about the meaning of unknown words. A third is concerned with word definitions—understanding what they consist of and producing them.

Contextual Analysis

Virtually every discussion of vocabulary instruction for struggling readers includes recommendations for teaching students how to use context and word parts to figure out the meaning of unknown words. Techniques like these make sense, particularly given the consensus that most of the word meanings we know have been acquired incidentally, using context and morphemic/structural analysis while we read (Graves & Watts-Taffe, 2002; Stahl, 1999). Aside from a logical connection, however, little research exists to support the assumption that specific instruction in teaching students how to use word and context clues is beneficial for increasing students' vocabulary size.

Contextual analysis refers to use of the syntactic and semantic clues found in context to derive word meanings. For instance, notice how the comparison used in the following sentence could help a reader determine something about the meaning of the underlined word: *Mary's quietness was in sharp contrast to Mike's vociferousness.* A number of clues of this sort have been identified (e.g., see Johnson & Pearson, 1984), and training in how to use and apply them can lead to improvements in an adult's ability to learn word meanings from context (Sternberg, 1987).

Outside of the laboratory, however, the kinds of texts used in school, as well as those that readers encounter in everyday life, do not always afford the opportunity to use contextual clues successfully because sentences do not always offer clear clues to meaning (Beck, McKeown, & McCaslin, 1983; Schatz & Baldwin, 1986). Moreover, vocabulary instruction that focuses on context can be especially problematic for students who have reading difficulties. In order to improve vocabulary using these techniques, students must have a base of word meanings on which to build and the ability to recognize and use the context clues expressed in what is read. Like their younger counterparts, less-skilled adolescent and adult readers have without a doubt acquired much knowledge about word meanings via incidental encounters with words in context. Frequently, however, their base of word knowledge is tied to specific contexts and characterized by experiences with words that tend to be aural in nature, rather than written. Consider, for example:

> . . . the man who assumed that *beneficial* must have something to do with money because he remembered that there used to be a company called "Beneficial Finance." Or the teen who defined ancestor as "one of your relatives who you don't see too much." Or the student who said a controversy was "something to do with government." Or the one who said about desist, "My high school teacher used to say that—cease and desist—I think it means sit down, shut up, and pay attention." (Curtis, 1997, pp. 81–82)

Kuhn and Stahl (1998) analyzed the results from 14 studies designed to teach students how to derive meaning from context. Their conclusion was that providing learners with opportunities to engage in wide and varied reading at a challenging level is as effective in building vocabulary as instruction with context clues per se.

Still another way in which contextual analysis is involved in word knowledge and text comprehension is via the category of words known as *signal words.* Signal words, such as *similarly* and *nevertheless,* help point out the connections among ideas in a text. Understanding (and use) of signal words improves steadily throughout adolescence (Nippold & Schwarz, 1992), although many less-skilled readers do not realize any benefit from them, either because they fail to attend to them, or because they fail to understand their meaning (Harris & Sipay, 1990).

In its review of studies of vocabulary instruction at the K–12 level, the National Reading Panel made little if any reference to signal words and their instruction. However, in the area of writing, teaching students to use signal words to combine sets of sentences into increasingly complex structures has been shown to improve the quality of their written products (see Hillocks & Smith, 2003 for a review). Comprehension may be improved by a similar instructional approach, particularly for students who lack understanding of the textual "road map" provided by this category of words. Signal words also occur quite frequently over a wide range of academic texts, making them good candidates for instructional focus with learners seeking to improve their content-area literacy skills (Coxhead, 2000).

In summary, the limitations in vocabulary knowledge and weaknesses in comprehension characteristic of learners who struggle with reading often prevent much growth in word meanings via a contextual approach (Curtis & Longo, 1999). In particular, less-skilled readers have been shown to have a tendency to focus too narrowly on some aspects of the context while missing others, and to have problems separating the meaning of the context from the meaning of the word itself (Beck, McKeown, & Kucan, 2002; Curtis, 1987). Instead, reading widely—especially materials that include challenging words—may be a more effective approach

for incorporating context in vocabulary learning. In addition, instructional focus on those words that have meaning within the context of other words—signal words—may improve comprehension and written expression (see also Tuley, 1998).

Morphological Knowledge and Skills

As grade level increases, instances of basic morpheme patterns (i.e., prefixes, suffixes, roots) of Latin and Greek origin become more frequent in content-area textbooks. These tend to be patterns that older students with reading difficulties are unfamiliar with, both because they lack knowledge of the meanings of word parts and because they have had limited experience using the parts they know as a way to derive the meaning of unfamiliar words (Henry, 1999, 2003).

Knowledge of common English suffixes (such as -tion, -ment, and -less) grows considerably between fourth grade and high school, and is related to reading comprehension in children (Nagy, Diakidoy, & Anderson, 1993) and in adult English-language learners (Qian, 1999). Children's awareness of the structure of words also seems to be significantly related to their ability to define them (Carlisle, 2000), although many high school students remain unaware of how word parts can help in deriving meaning (Stahl, 1999). Success in reading is also tied to the ability to use clues to meaning found when words from different languages share the same or similar form and have at least one sense in common (i.e., cognates). For instance, bilingual Hispanic children who varied in their proficiency in reading English also varied in the extent to which they took advantage of cognates as aids in comprehension (Garcia, 1991).

Not surprisingly, then, vocabulary instruction that teaches the meaning of common roots, prefixes, and affixes as an aid in determining the meaning of words is recognized as a basic instructional method in a number of texts written for practitioners (e.g., see Blachowicz & Fisher, 2002; Stahl, 1999), as well as in reviews of vocabulary research studies (e.g., see the report of the National Reading Panel, 2000). What is surprising, however, is the paucity of research evidence supporting the effectiveness of morphemic analysis instruction as a way to improve vocabulary and comprehension (Baumann et al., 2002). In part, this may be because studies of morphemic analysis instruction have tended to be short-term, limiting their impact to a study of the transfer of the particular roots and affixes taught, rather than allowing for a long-term assessment of the value of morphemic

analysis as a strategy for independent word learning (Baumann, Edwards, Boland, Olejnik, & Kame'enui, 2003). In addition, however, morphemic analysis is now viewed by many experts as helpful, but not sufficient in and of itself, for improving comprehension (Baumann et al., 2003).

Morphology has also been implicated in adult literacy learners' difficulties with spelling (Viise, 1996; Worthy & Viise, 1996). As Shaughnessy (1977) summarized the situation:

> Aware that things often have to change when letters are added at the beginnings or ends of words, students are not prepared to make these changes deliberately. Here again their unfamiliarity with the "carpentry" of words keeps them from being able to apply some of the useful rules for affixation, which requires the perception of syllables and stress and an understanding of the way certain letters . . . affect the pronunciation of vowels. (p. 171)

In summary, little evidence exists in support of direct instruction in particular root words or affixes as an effective approach for improving vocabulary and comprehension. Discussion of morphological features of words may be a useful component of vocabulary instruction for both children and adults, however, and attention to prefixes, suffixes, and roots may lead to improvements in spelling for adult literacy learners.

Definitional Skill

The way in which readers define words changes significantly during reading development (McGhee-Bidlack, 1991; Nippold, Hegel, Sohlberg, & Schwarz, 1999). Whereas younger children (and less-skilled readers) define words in terms of functions (*"You sit on a chair"*) and specific contexts (*"my rocking chair"*), more proficient readers produce definitions that contain information about category memberships and essential features (*"A chair is a seat for one person; it has four legs and a back"*).

In the case of familiar words, increased understanding of what constitutes an appropriate definition appears to underlie the difference in the way that younger and older students define words. With less familiar words, though, differences in categorical and feature knowledge about the words themselves seem to play a role in how words are defined (Nippold, 1998). For instance, with abstract words like *idleness,* Nippold and her colleagues (1999) found that 6th- and 9th-grade students produced less complete definitions ("It's like laziness—just sitting around all day and doing nothing") than did 12th-grade students and college students ("It's associated with a

state of laziness or lack of productivity; isn't necessarily a negative thing, though—could also be a state of relaxation or rest").

The ways in which words are defined has significance in vocabulary learning for at least two reasons. First, as illustrated earlier with the words *beneficial, ancestor, controversy,* and *desist,* a learner's definition of a word often reflects the extent to which he or she is having difficulty separating the meaning of that word from the context in which it occurs. And second, appropriate definitions—those that contain information about essential features and category memberships—provide learners with the basis they need for understanding and building new relationships among words and concepts. For example, although a functional definition of *chair* and *couch* would be the same—a place for people to sit—a more formal definition of each word's meaning would make apparent the similarities and differences between them, thereby facilitating understanding of new vocabulary, like *divan* or *pew.*

Research on definitional skill has also called our attention to the differences that exist between the kinds of definitions helpful for vocabulary learning and the kinds of definitions found in most dictionaries (McKeown, 1993). As Beck et al. (2002) and others have pointed out (see also Miller & Gildea, 1987), dictionaries tend to use vague language and fail to specify how the target word differs from other similar words (e.g., *couch: an article of furniture used for sitting or reclining*). In contrast, based on her research, McKeown (1993) found that in order for definitions to be instructionally effective, they should: (a) pinpoint a word's meaning by explaining its typical use, and (b) use language that is readily accessible.

Summing up, understanding the nature of word definitions and the ability to produce them are skills related to growth in reading ability. Although these aspects of vocabulary learning are yet to be examined in any depth in adult literacy learners, it seems likely that a significant relationship exists for this population as well, as they develop their ability to read. Of particular importance for older learners may be finding ways that tools like dictionaries can be used effectively to arrive at adequate definitions for word meanings that are unknown (Blachowicz & Fisher, 2002).

In this section, three aspects of vocabulary representing sources of vocabulary learning—contextual analysis, morphological knowledge and skills, and definitional skill—were described. In the section that follows, two additional aspects of vocabulary suggested as important for instruction within the literatures on K–12 students and second-language learners are discussed. These aspects—breadth and depth of knowledge about word meanings—have to do with the nature of vocabulary learning.

THE NATURE OF VOCABULARY LEARNING

Vocabulary breadth and depth are dimensions of a person's vocabulary repertoire. *Vocabulary breadth* refers to the number and kinds of word meanings known. *Vocabulary depth* refers to the flexibility and precision of word-meaning knowledge.

Breadth of Vocabulary

The breadth of a learner's word knowledge (also referred to as vocabulary size) is the number of words for which the individual has at least some familiarity with their meaning. Simply put, vocabulary breadth is important because the more word meanings learners know, the easier it is for them to acquire new ones.

Estimates of the number of words known by the time students reach high school vary widely, ranging anywhere from 15,000 to 45,000 root words (Biemiller, 1999; Biemiller & Slonim, 2001; Stahl, 1999). Regardless of the figure we accept, breadth of vocabulary clearly grows tremendously during the years between kindergarten and 12th grade. For instance, in typically developing readers, vocabulary size more than doubles between the 6th and 12th grades. This is not so for older learners with reading difficulties, however. Studies of vocabulary size in adolescent poor readers are sparse, but clinical work suggests that as many as one out of every two teens may have vocabularies that are weak enough to cause comprehension problems (Curtis & Longo, 1999). Greenberg et al. (1997) found that ABE students reading at the 3rd- and 4th-grade levels had larger vocabularies than children reading at the same levels; however, by the 5th-grade reading level, no differences between the children and adults were found. Inner-city adults seeking help from a literacy program have also been shown to have vocabularies well below average (Gottesman, Bennett, Nathan, & Kelly, 1996).

In another study of low-literacy adults, Davidson & Strucker (2002) also found that knowledge of word meanings was an area of great need. The expressive vocabularies of their study participants averaged below the 7th-grade level, and their receptive vocabularies (as measured by the PPVT–III[3]) were below the 10th percentile of the norming population.

[3]The Peabody Picture Vocabulary Test–Third Edition (PPVT–III) is an individually administered test of listening (receptive) vocabulary. A learner is shown four pictures and asked to indicate (verbally or nonverbally) the picture that best represents a word spoken by the examiner (Dunn & Dunn, 1997).

Davidson and Strucker (2002) examined the reading errors of native and nonnative speakers of English. They found that native speakers made twice as many real-word substitutions (e.g., saying "property" for *prosperity*) as nonnative speakers, whereas nonnative speakers made nearly three times as many phonetically plausible substitutions (e.g., saying "so-litary" for *solitary*) as native speakers. Given that the native speakers had larger English vocabularies than did the nonnative speakers, this pattern of results suggests that breadth of vocabulary knowledge affects not only comprehension, but can also affect word recognition, at least among ABE learners.

Depth of Vocabulary

Knowledge of word meanings is rarely (if ever) an all or nothing matter. Depth of vocabulary refers to how much learners know about the meanings of the words they are familiar with, along with the connections that exist among the word meanings they know.

Developing depth of vocabulary knowledge is the process of clarifying and enriching the meanings of known words and building interconnections among them. To illustrate, consider Fig. 3.1. In this example, depth of vocabulary knowledge about the target word (stretch) refers not only to how much is known about the meaning of that word (i.e., its link to the meanings of exercise and extend), but also to the interconnections that exist between the meanings of those words and other words that are related (e.g., practice, exert, taut, etc.).

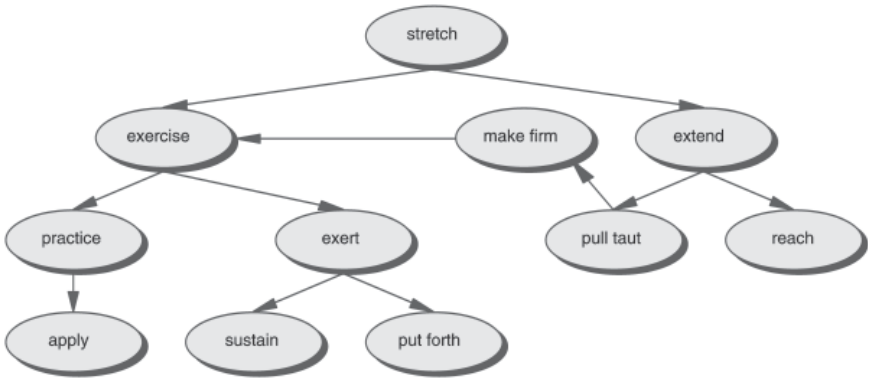

FIG. 3.1. Example of a semantic map.

Like breadth of vocabulary, depth of vocabulary knowledge changes with development. One aspect of vocabulary depth has to do with acquisition of new meanings for known words. For example, by 4th grade, 90% of children know that list can mean "to write down in order," but it is not until college age that a majority know that it can also mean "to tilt" (Dale & O'Rourke, 1981). Among native and nonnative speakers, the more word meanings one knows, the more one tends to know about the meanings of known words (Curtis, 1987; Qian, 1999).

Knowledge about categories of words has also been shown to change as a function of development. For example, understanding of words used to make distinctions among cognitive states such as knowing and believing and inferring becomes more precise with age and literacy development (Booth & Hall, 1994; Nippold, 1998). Adult literacy learners, on the other hand, often tend to be inflexible in their use of words. For example, Byrne, Crowe, Hale, Meek, and Epps (1996) found that adults with low literacy levels seemed unable "to appreciate that one word may have more than one meaning, and that more than one word can be used to express the same meaning" (p. 43).

Another aspect of vocabulary depth that changes as a function of development is the level of abstractness that learners use to characterize word relationships. For instance, when Anglin (1970) gave the same set of words to children and adults and asked them to sort them based on similarity in meaning, younger children put together words based on thematic, concrete relationships (like putting eat with apple, and cold with air), whereas adults grouped them based on more abstract categories, like parts of speech (e.g., eat with live and cold with dark).

A useful framework for thinking about these differences in depth as well as breadth of word meaning knowledge is Dale's (1965) "stages of word knowledge." According to Dale, four stages of comprehension are involved in word knowledge: words whose meanings are known (Stage 4); words whose meanings are recognized in some contexts but not others (Stage 3); words that have been seen or heard, but whose meanings are not known (Stage 2); and finally, words that have never been heard or seen before (Stage 1).

Vocabulary breadth refers to the number of words in Stages 3 and 4—that is, words for which a learner has at least a minimum amount of knowledge about their meanings. Vocabulary depth refers to words that are in Stage 4—words for which a learner has sufficient knowledge of their meanings to understand and use them in a variety of contexts and to recognize their relationships to other words.

Although instruction that leads to Stage 3 knowledge is usually sufficient for demonstrating that a word is known (particularly when knowing is measured by a typical multiple-choice test), instruction that leads to Stage 4 knowledge is required to improve comprehension (Curtis, 1987).

EFFECTIVE APPROACHES TO TEACHING VOCABULARY

Arriving at conclusions about effective vocabulary instruction in low-literacy adults has proven to be difficult (Kruidenier, 2002). A handful of studies have found that vocabulary increases as a result of instruction (Byrne et al., 1996; Gold & Johnson, 1982; Lazar, Bean, & Van Horn, 1998; McDonald, 1997; Nickse, Speicher, & Buchek, 1988; Philliber, Spillman, & King, 1996). However, those studies do not identify specific approaches, nor do they include control groups in their design. One study found no effect of literacy instruction on vocabulary (Venezky, Bristow, & Sabatini, 1994). In another study—the only one that used a control group—reading vocabulary improved, but oral vocabulary did not (Gold & Horn, 1982).

Even so, from work done with children and adolescents, we can identify some general principles of vocabulary instruction that seem likely to be applicable to adult literacy learners as well. These include emphasis on direct instruction, differentiation of word meanings, promotion of word consciousness, and engagement in wide reading.

Direct Instruction in Word Meanings

After reviewing the research on vocabulary learning, the National Reading Panel concluded that direct instruction was highly effective for vocabulary learning. Indeed, many experts now recommend vocabulary instruction that is intensive—that is, new word meanings are introduced, learners are provided with multiple opportunities to actively process and extend those meanings, and precise and sophisticated use of the word meanings is encouraged (Beck et al., 2002; Curtis & Longo, 2001; Stahl & Fairbanks, 1986). Such an approach would seem to be particularly important for adult learners, who have missed out on so many opportunities throughout the years to acquire vocabulary knowledge (Greenberg et al., 1997).

In a recent discussion of the challenges associated with direct vocabulary instruction, a panel of experts concluded that, "Effective vocabulary

instruction presupposes choosing the right words to teach" (RAND Reading Study Group, 2002, p. 36). Beck and her colleagues have described a scheme—called *word tiers*—that helps in thinking about which words should be part of general vocabulary instruction (Beck et al., 2002). In tier one are basic words like *store* and *girl* and *truck.* Tier two consists of more abstract words that are common in a variety of school subjects, like *complex* and *consequence.* In tier three are words that are of low frequency and are associated with specific domains, like *trajectory* and *photosynthesis.* (See also Laufer & Nation, 1999, who distinguish among high-frequency words, high-utility academic vocabulary, and domain-specific technical vocabulary.)

Because words in the first tier occur so frequently in spoken language, not much instructional time usually needs to be spent on teaching their meanings, especially to native-language speakers. English-language learners—particularly those in the initial stages of language development—may need more assistance, depending on native-language skills and cultural considerations (Ernst-Slavit, Moore, & Maloney, 2002).

Words in tiers two and three are ones associated with academic language. Because of their connection with specific domains of knowledge, tier-three words are often best taught within the particular content area in which they occur. Due to the high utility of tier-two words, however, direct and systematic vocabulary instruction that incorporates them can have a powerful influence on students' vocabulary development, and as a result, comprehension. This seems so especially for English-language learners, where deep and extensive experiences with vocabulary words seem to produce the best results (Gersten & Jiménez, 1994).

When making choices about which word meanings to teach, teachers most often select vocabulary words from the texts that students are reading. Work with adolescents with reading difficulties suggests that a much broader approach can be effective (Curtis & Longo, 2001). Meanings to be taught can be expanded beyond those that appear in the learners' reading materials. All that is required is that the instructed word meanings be related to what students are reading, and that learners receive guidance in their application of those meanings. (For example, even though the word *decision* does not appear in the current paragraph, the meaning of *decision* does apply, providing an opportunity to teach its meaning.) Similarly, research shows that grouping words thematically is not necessary if vocabulary instruction is varied and rich (see Stahl, 1999 for a summary of this work). In fact, learners can often be hindered in building their own connections among meanings when those connections are built for them a priori.

Word lists have a long tradition as tools to help teachers make decisions about which words to teach. For instance, in the introduction to their *Teacher's Word Book,* Thorndike and Lorge (1944) wrote:

> A teacher should decide, concerning many words which occur in books or articles to be read by the class, whether to have the class learn the word well enough so that the ability to know the sound and the important meaning or meanings of the word when they see it will be a permanent part of their stock of word knowledge, or merely inform them of its meaning temporarily so that they can understand and enjoy the reading matter in which it occurs. (p. x)

More recent lists suitable for use with adult literacy learners include the most frequently used high-utility words (Corson, 1997; Coxhead, 2000), as well as words important for survival and success (Davis & McDaniel, 1998).

Differentiating Word Meanings

Highlighting distinctions among word meanings can enhance the success of vocabulary instruction. This sort of semantic analysis—whether it involves comparison, classification, analogical reasoning, or figurative language—has been found to be among the most powerful strategies teachers have for enhancing student reading achievement (Marzano, Pickering, & Pollock, 2001). For instance, to build rich and interconnected networks of word meanings, open-ended analogies—analogies with more than one correct answer (e.g., *confine : fences :: constrict: ?*)—seem to work particularly well. With more than one correct answer, learners can be encouraged to make their reasoning explicit, providing opportunities for discussion of additional relationships among meanings to be discovered and evaluated (Curtis & Longo, 2001).

Techniques that involve graphic representations of the relationships among word meanings are also effective tools for promoting discussion of similarities and differences. For example, semantic mapping involves making a visual representation of the relationships that exist among vocabulary words and concepts, along with the categories in which they fit. (The schematic of *stretch* and related words shown earlier is an example of a semantic map.) Semantic feature analysis involves building a matrix that identifies both the common and unique characteristics (or features) of words that belong to a particular category (Johnson & Pearson, 1984). For example, a semantic feature analysis for the concept *game* is shown in Fig. 3.2. Via semantic feature analysis, students learn which characteristics are defin-

Concept: game Examples:	rules	uniforms	ball	points	dice	strikes	league
football	+	+	+	+	–	–	+
golf	+	–	+	+	–	–	+
Monopoly	+	–	–	+	+	–	–
bowling	+	+	+	+	–	+	+
baseball	+	+	+	+	–	+	+
cribbage	+	–	–	+	–	–	–
pool	+	–	+	+	–	–	–

FIG. 3.2. Semantic feature analysis of the concept "game."

ing attributes (i.e., common to all examples of a concept—like *rules*) and which ones are specific to particular examples (like *ball*).

Semantic mapping and semantic feature analysis have both been shown to be more effective techniques for secondary-school students who are learning content-area concepts than simply providing the students with the definitions of the concepts (Bos & Anders, 1992). A drawback of both techniques is that their effectiveness depends on the teacher being present and the material being suited to being introduced in a certain way. In other words, they are strategies for teaching, not activities that can be student initiated and student directed (Weinstein & Mayer, 1986).

Analogical reasoning and graphic representation have both been combined in a technique known as *concept anchoring,* an instructional tool designed to improve secondary school students' comprehension of complex concepts (Bulgren et al., 2000). Concept anchoring connects new information to what is already known via a visual display that relates key characteristics of the new concept to similar characteristics of a familiar one. For instance, the workings of a camera (a familiar object) would be used to teach about the functioning of the human eye (a new concept). When compared to what they learned from a more traditional, lecture-style presentation of information, Bulgren and his colleagues found that high school students at all ability levels (including students with learning disabilities) had improved understanding of new concepts when a concept-anchoring approach was used.

Word sorts are another technique that has been suggested as effective for adult learners in promoting discussion of classification of words and their defining characteristics (Olle, 1994). In a word sort, students are presented with a set of words (e.g., food-related terms) written on cards and they are asked to sort the words into columns. Teachers can provide learners with the categories to use, or ask them to establish their own categories (see also Blachowicz & Fisher, 2002). Regardless of the approach

used, students should be asked to explain why they sorted the words in the ways that they did.

Promoting Word Consciousness

Increasingly, vocabulary experts have been pointing to the importance of nurturing students' awareness of and interest in words and their meanings (Anderson & Nagy, 1996). Graves and Watts-Taffe (2002) describe five approaches to fostering consciousness about words in learners. The first involves modeling enthusiasm for and skill in using words adeptly. The second has to do with providing opportunities to experience pleasure from manipulating the looks, sounds, and meanings of words. The third entails involving learners in instructional activities where "rich, precise, interesting, and inventive use of words is valued" (p. 150). The fourth consists of encouraging students to engage in research projects that investigate words and their meanings. The fifth involves providing instruction that enhances students' understanding of the complexity of word knowledge and vocabulary learning.

As noted by the RAND Reading Study Group (2002), research has yet to demonstrate the specific role that word consciousness plays in vocabulary learning and any subsequent improvement in comprehension. Practitioners, however, have identified techniques that lead to positive results when they are part of a program of vocabulary instruction. For example, encouraging struggling adolescent readers to report "sightings" of vocabulary words (Beck et al., 2002) in newspapers and magazines and on television, and to use their vocabulary words in both speaking and writing motivates them to generalize vocabulary learning and see it as something that is not purely academic (Curtis & Longo, 1999). Vocabulary self-selection, where students and the teacher are all responsible for nominating potential vocabulary words for further study, has also been shown to increase engagement (Haggard, 1982; Ruddell & Shearer, 2002). Awareness of relationships among cognates—words similar in form and meaning in different languages, like *rhyme* and *rima,* and *excellent* and *excelente*—is a specific type of word consciousness that has significance for English-language learners (RAND, 2002).

Engaging in Wide Reading

The importance of the role of wide and varied reading in the development of vocabulary knowledge has long been recognized and is well docu-

mented (e.g., see Anderson, Wilson, & Fielding, 1988; Cunningham & Stanovich, 1991). Significantly, however, engaging in reading alone is not always sufficient to improve word knowledge, especially with regard to vocabulary learning in students with reading difficulties (Jenkins, Stein, & Wysocki, 1984). Growth in vocabulary for these students seems to require that reading be followed by other activities that extend their understanding, such as discussion of what has been read (Stahl & Clark, 1987). In particular, the greatest gains seem to occur when learners have opportunities to engage in activities that promote their understanding and elaboration of contextual use of meanings (Anderson & Nagy, 1996).

Learners also seem to retain meanings of new vocabulary best when they are encouraged to generate their own elaborations of context (Curtis & Longo, 2001). For example, when introducing word meanings, learners should be directed toward coming up with contexts already familiar to them in which the new words can be applied. Once meanings have been introduced, students should be provided with multiple opportunities (via discussion and writing activities) to apply the new word meanings. In this way, vocabulary instruction is always occurring in context, but the emphasis is on helping the learner make inferences about contexts in which word meanings fit (rather than asking them to make inferences about word meanings from context they have been given).

RECOMMENDATIONS FOR RESEARCH, POLICY, AND PRACTICE

As noted at the outset, few studies exist in the area of vocabulary acquisition and instruction in adult basic education. Consequently, first steps toward improving policy and practice will require development of an agenda for research. Many avenues are possible, but the ones with most promise may be those that build on what has already been learned from existing K–12 research.

For instance, researchers have suggested a number of hypotheses to account for the relationship between vocabulary and comprehension in children. Research to establish (a) the relative importance of each of these hypotheses in understanding the link between vocabulary and comprehension among adult learners, and (b) whether some of these hypotheses have more relevance than others at certain points in adult reading development could provide useful information for informing policy and practice. Additional research would study which word meanings and vocabulary skills produce

the greatest impact for ABE literacy learners. Research could also determine if different words or skills are more appropriate for some learners than for others or at some points in reading development more than others.

Better understanding about the cumulative effects that reading difficulties can have on adults' vocabulary knowledge and word learning would be beneficial as well. Among children with reading problems, for example, struggles with word identification result in an inability to develop fluency in word recognition. Lack of fluent word recognition then causes these students to avoid reading, which in turn leads them to miss out on opportunities to develop vocabulary knowledge. Generally referred to now as the "Matthew Effect" (Stanovich, 1986)—good readers continue to get more and more skilled, poor readers continue to fall farther and farther behind—interactions like these appear to be fertile areas for further exploration among adult learners.

Investigation concerning the impact that social class and language differences have on the interaction between vocabulary and comprehension in adult learners may also yield important results. Among economically disadvantaged children, for example, growth in knowledge of word meanings begins to decelerate at about the fourth-grade level, followed by word recognition and spelling, and finally, by the ability to comprehend text (Chall, Jacobs, & Baldwin, 1990). Chall and others (Becker, 1977, and Biemiller, 1999) have concluded that these children need more intensive interventions focusing on vocabulary if they are to have any chance at keeping up with their more advantaged peers. The same trends may hold for adult literacy learners. If this is the case, the instructional implications may be the same or different. Similarly, vocabulary seems to play a greater role in the comprehension skills of children who are proficient bilingual readers than it does for proficient monolingual readers (Jiménez, Garcia, & Pearson, 1995). The same may be true for the development of reading skills of ABE learners.

Better tools for identifying which ABE literacy learners might benefit from a vocabulary intervention, as well as for assessing how much growth results, would also advance the field. At present, success on most standardized vocabulary tests requires only minimal knowledge about word meanings (Curtis, 1987). As a consequence, if the purpose is to obtain a rough estimate of the range and level of a learner's vocabulary knowledge, then tests of this sort can be helpful. However, if the purpose is to understand how well learners know the meanings of words that are familiar to them, and how proficient they are in using their vocabulary knowledge when comprehending, other measures will need to be developed.

Finally, as recognized by the National Reading Panel (2000), the role that technology can play in improving vocabulary learning and instruction for all learners is in its infancy, but would seem to hold particular promise for the needs of adult literacy learners. The capability for building adults' background knowledge via multimedia "texts" and for improving vocabulary knowledge via digital texts already exists. In addition, however, computers would seem to be the optimal way to customize the vocabulary knowledge and skills that adult learners need. Technology would afford ways to provide the multiple opportunities needed to experience new word meanings in a variety of contexts, and to ensure that vocabulary knowledge and skills are introduced and learned in active and generative ways.

Concerning policy, at least two important implications can be drawn from the literature on vocabulary learning in adult literacy learners. The first has to do with the ways in which the success of adult literacy programs is measured. Based on the descriptions of programs contained in the literature, instructional impact frequently is assessed using tools that estimate gains in "total reading"—a composite of vocabulary and comprehension. Identifying and disseminating best practices in vocabulary, however, will necessitate use of assessments that more directly measure relevant kinds of word-meaning knowledge and skills in ways that will be useful to teachers.

The second implication for policy has to do with professional development. As research identifies the processes and practices that teachers can use to promote vocabulary learning, technical assistance will be required so that program personnel can become familiar with the research and its implications for vocabulary instruction.

Finally, with regard to the vocabulary practice, no definite conclusions can be drawn, due to the paucity of research on what works with adult literacy learners. From my clinical work, though, I would venture to predict the following. Too many adults with a history of reading difficulties are getting caught in the following predicament: Their lack of vocabulary knowledge is causing them comprehension problems, and their comprehension problems are preventing them from overcoming their vocabulary deficits. For many of these learners, a multistage approach to vocabulary instruction may be required. For example, to teach students the meaning of the word "persistent," teachers could take the following approach:

1. Stage One: Teachers use direct instruction to introduce word meanings, and then solicit examples from learners of familiar contexts in which those meanings could apply (e.g., Can you think of a time when

you were persistent? Do some occupations require more persistence than others?).

2. Stage Two: Teachers guide learners through further understanding and application of the new word meanings with oral and written activities that extend the meanings (e.g., Can persistence ever be extinguished? Could persistence ever be a barrier to success?).

2. Stage Three: Teachers provide learners with independent opportunities to use their new understanding (e.g., When reading the following article about the Wright Brothers, think about the role that persistence played in their accomplishments.).

It is this sort of intensive vocabulary instruction identified as effective with younger readers—instruction that helps them focus on creation of meaningful contexts that make connections to what they already know—that may be the only way to help adult learners to turn their situation around.

ACKNOWLEDGMENTS

I am grateful to Margaret McKeown and Daphne Greenberg for their comments on an earlier version of this chapter.

REFERENCES

Anderson, R. C., & Freebody, P. (1981). Vocabulary knowledge. In J. T. Guthrie (Ed.), *Comprehension and teaching* (pp. 77–117). Newark, DE: International Reading Association.

Anderson, R. C., & Nagy, W. E. (1996). Word meanings. In R. Barr, M. L. Kamil, P. B. Mosenthal, & P. D. Pearson (Eds.), *Handbook of reading research* (Vol. II, pp. 690–724). Mahwah, NJ: Lawrence Erlbaum Associates.

Anderson, R. C., Wilson, P. T., & Fielding, L. G. (1988). Growth in reading and how children spend their time outside of school. *Reading Research Quarterly, 23,* 285–303.

Anglin, J. M. (1970). *The growth of word meaning.* Cambridge, MA: MIT Press.

Baumann, J. F., Edwards, E. C., Boland, E. M., Olejnik, S., & Kame'enui, E. J. (2003). Vocabulary tricks: Effects of instruction in morphology and context on fifth-grade students' ability to derive and infer word meanings. *American Educational Research Journal, 40,* 447–494.

Baumann, J. F., Edwards, E. C., Font, G., Tereshinski, C. A., Kame'enui, E. J., & Olejnik, S. (2002). Teaching morphemic and contextual analysis to fifth grade students. *Reading Research Quarterly, 37,* 150–176.

Baumann, J. F., Kame'enui, E. J., & Ash, G. E. (2003). Research on vocabulary instruction: Voltaire redux. In J. Flood, D. Lapp, J. R. Squire, & J. M. Jensen (Eds.), *Handbook of research on teaching the English language arts* (pp. 752–785). Mahwah, NJ: Lawrence Erlbaum Associates.

Beck, I. L., McKeown, M. G., & Kucan, L. (2002). *Bringing words to life: Robust vocabulary instruction.* New York: Guilford.

Beck, I. L., McKeown, M. G., & McCaslin, E. S. (1983). Vocabulary development: All contexts are not created equal. *Elementary School Journal, 83,* 177–181.

Beck, I. L., Perfetti, C. A., & McKeown, M. G. (1982). Effects of long-term vocabulary instruction on lexical access and reading comprehension. *Journal of Educational Psychology, 74,* 506–521.

Becker, W. C. (1977). Teaching reading and language to the disadvantaged: What we have learned from field research. *Harvard Educational Review, 47,* 518–543.

Biemiller, A. (1999). *Language and reading success.* Cambridge, MA: Brookline Books.

Biemiller, A., & Slonim, N. (2001). Estimating root word vocabulary growth in normative and advantaged populations: Evidence for a common sequence of vocabulary acquisition. *Journal of Educational Psychology, 93,* 498–520.

Blachowicz, C., & Fisher, P. J. (2002). *Teaching vocabulary in all classrooms.* Upper Saddle River, NJ: Merrill Prentice Hall.

Booth, J. R., & Hall, W. S. (1994). Role of the cognitive internal state lexicon in reading comprehension. *Journal of Educational Psychology, 86,* 413–422.

Bos, C. S., & Anders, P. L. (1992). Using interactive teaching and learning strategies to promote text comprehension and content learning for students with learning disabilities. *International Journal of Disability, Development and Education, 39,* 225–238.

Byrne, M. E., Crowe, T. A., Hale, S. T., Meek, E. E., & Epps, D. (1996). Metalinguistic and pragmatic abilities of participants in adult literacy programs. *Journal of Communication Disorders, 29,* 37–49.

Bulgren, J. A., Deshler, D. D., Schumaker, J. B., & Lenz, B. K. (2000). The use and effectiveness of analogical instruction in diverse secondary content classrooms. *Journal of Educational Psychology, 92,* 426–441.

Carlisle, J. F. (2000). Awareness of the structure and meaning of morphologically complex words: Impact on reading. *Reading and Writing, 12,* 169–190.

Chall, J. S. (1983). *Stages of reading development.* New York: McGraw-Hill.

Chall, J. S., Jacobs, V. A., & Baldwin, L. E. (1990). *The reading crisis: Why poor children fall behind.* Cambridge, MA: Harvard University Press.

Corson, D. (1997). The learning and use of academic English words. *Language and Learning, 47,* 671–718.

Coxhead, A. (2000). A new academic word list. *TESOL Quarterly, 34,* 213–238.

Cunningham, A. E., & Stanovich, K. E. (1991). Tracking the unique effects of print exposure in children: Associations with vocabulary, general knowledge, and spelling. *Journal of Educational Psychology, 83,* 264–274. Cambridge, MA: Brookline Books.

Curtis, M. E. (1987). Vocabulary testing and vocabulary instruction. In M. G. McKeown & M. E. Curtis (Eds.), *The nature of vocabulary acquisition* (pp. 37–51). Hillsdale, NJ: Lawrence Erlbaum Associates.

Curtis, M. E. (1997). Teaching reading to children, adolescents, and adults: Similarities and differences. In L. R. Putnam (Ed.), *Readings on language and literacy* (pp. 75–88). Cambridge, MA: Brookline Books.

Curtis, M. E., & Longo, A. M. (1999). *When adolescents can't read: Methods and materials that work.* Cambridge, MA: Brookline Books.

Curtis, M. E., & Longo, A. M. (2001). Teaching vocabulary to adolescents to improve comprehension. *Reading Online, 5*(4). Available from http://www.readingonline.org.

Dale, E. (1965). Vocabulary measurement: Techniques and major findings. *Elementary Education, 42,* 895–901, 948.

Dale, E., & O'Rourke, J. (1981). *The living word vocabulary.* Chicago: World Book.

Davidson, R. K., & Strucker, J. (2002). Patterns of word-recognition errors among adult basic education native and nonnative speakers of English. *Scientific Studies of Reading, 6,* 299–316.

Davis, A. P., & McDaniel, T. R. (1998). An essential vocabulary: An update. *Reading Teacher, 52,* 308–312.

Davis, F. B. (1944). Fundamental factors of comprehension in reading. *Psychometrika, 9,* 185–197.

Dunn, L. M., & Dunn, L. M. (1997). *Peabody Picture Vocabulary Test* (3rd ed.). Circle Pines, MN: American Guidance Service.

Ernst-Slavit, G., Moore, M., & Maloney, C. (2002). Changing lives: Teaching English and literature to ESL students. *Journal of Adolescent & Adult Literacy, 46,* 116–128.

Fitzgerald, J. (1995). English-as-a-second-language learners' cognitive reading processes: A review of research in the United States. *Review of Educational Research, 1995, 65,* 145–190.

Garcia, G. E. (1991). Factors influencing the English reading test performance of Spanish-speaking Hispanic students. *Reading Research Quarterly, 26,* 371–392.

Gersten, R., & Jiménez, R. (1994). A delicate balance: Enhancing literature instruction for students of English as a second language. *The Reading Teacher, 47,* 438–449.

Gillespie, M. K. (2001). Research in writing: Implications for adult literacy education. In J. Comings, B. Garner, & C. Smith (Eds.), *Annual Review of Adult Learning and Literacy* (Vol. 2, pp. 63–110). San Francisco: Jossey-Bass.

Gold, P. C., & Horn, P. L. (1982). Achievement in reading, verbal language, listening comprehension, and locus of control of adult illiterates in a volunteer tutorial project. *Perceptual and Motor Skills, 54,* 1243–1250.

Gold, P. C., & Johnson, J. A. (1982). Prediction of achievement in reading, self-esteem, auding, and verbal language by adult illiterates in a psychoeducational tutorial program. *Journal of Clinical Psychology, 38,* 513–522.

Gottesman, R. L., Bennett, R. E., Nathan, R. G., & Kelly, M. S. (1996). Inner-city adults with severe reading difficulties: A closer look. *Journal of Learning Disabilities, 29,* 589–597.

Graves, M. F., & Watts-Taffe, S. M. (2002). The place of word consciousness in a research-based vocabulary program. In A. E. Farstrup & S. J. Samuels (Eds.), *What research has to say about reading instruction* (3rd ed., pp. 140–165). Newark, DE: International Reading Assocation.

Greenberg, D., Ehri, L. C., & Perin, D. (1997). Are word reading processes the same or different in adult literacy students and third–fifth graders matched for reading level? *Journal of Educational Psychology, 89,* 262–275.

Haggard, M. R. (1982). The vocabulary self-selection strategy: An active approach to word learning. *Journal of Reading, 26,* 203–207.

Harris, A. J., & Sipay, E. R. (1990). *How to increase reading ability* (9th ed.). New York: Longman.

Henry, M. K. (1999). A short history of the English language. In J. Birsh (Ed.), *Multisensory teaching of basic language skills* (pp. 119–139). Baltimore: Brookes.

Henry, M. K. (2003). *Unlocking literacy: Effective decoding and spelling instruction.* Baltimore: Brookes.

Hillocks, G., & Smith, M. W. (2003). Grammar and literacy learning. In J. Flood, D. Lapp, J. R. Squire, & J. M. Jensen (Eds.), *Handbook of research on teaching the English language arts* (pp. 721–737). Mahwah, NJ: Lawrence Erlbaum Associates.

Jenkins, J. R., Stein, M. L., & Wysocki, K. (1984). Learning vocabulary through reading. *American Educational Research Journal, 21,* 767–787.

Jiménez, R. T., Garcia, G. E., & Pearson, P. D. (1995). Three children, two languages, and strategic learning: Case studies in bilingual/monolingual reading. *American Educational Research Journal, 32,* 67–97.

Johnson, D. D., & Pearson, P. D. (1984). *Teaching reading vocabulary.* New York: Holt, Rinehart and Winston.

Kruidenier, J. (2002). *Research-based principles for adult basic education reading instruction.* Washington, DC: The National Institute for Literacy.

Kuhn, M. R., & Stahl, S. A. (1998). Teaching students to learn word meanings from context: A synthesis and some questions. *Journal of Literacy Research, 30,* 119–138.

Laufer, B., & Nation, P. (1999). A vocabulary-size test of controlled productive ability. *Language Testing, 16,* 33–51.

Lazar, M. K., Bean, R. M., & Van Horn, B. V. (1998). Linking the success of a basic skills program to workplace practices and productivity. *Journal of Adolescent and Adult Literacy, 41,* 352–362.

McBride-Chang, C., Manis, E. R., Seidenberg, M. S., Custodio, R. G., & Doi, L. M. (1993). Print exposure as a predictor of word reading and reading comprehension in disabled and nondisabled readers. *Journal of Educational Psychology, 85,* 230–238.

McDonald, B. A. (1997). The impact of content-based instruction: Three studies. *Focus on Basics,* 1(D).

McGhee-Bidlack, B. (1991). The development of noun definitions: A metalinguistic analysis. *Journal of Child Language, 18,* 417–434.

McKeown, M. G. (1993). Creating effective definitions for young word learners. *Reading Research Quarterly, 28,* 16–31.

Marzano, R. J., Pickering, D. J., & Pollock, J. E. (2001). *Classroom instruction that works: Research-based strategies for increasing student achievement.* Alexandria, VA: Association for Supervision and Curriculum Development.

Mezynski, K. (1983). Issues concerning the acquisition of knowledge: Effects of vocabulary training on reading comprehension. *Review of Educational Research, 53,* 253–279.

Miller, G. A., & Gildea, P. M. (1987). How children learn words. *Scientific American, 257,* 94–99.

Nagy, W. E., Anderson, R. C., & Herman, P. A. (1987). Learning word meanings from context during normal reading. *American Educational Research Journal, 24,* 237–270.

Nagy, W. E., Diakidoy, I. N., & Anderson, R. C. (1993). The acquisition of morphology: Learning the contribution of suffixes to the meanings of derivatives. *Journal of Reading Behavior, 25,* 155–170.

National Reading Panel (2000). *Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction.* Washington, DC: National Institute of Child Health and Human Development.

Nickse, R. S., Speicher, A. M., & Buchek, P. C. (1988). An intergenerational adult literacy project: A family intervention/prevention model. *Journal of Reading, 31,* 634–642.

Nippold, M. A. (1998). *Later language development* (2nd ed.). Austin, TX: Pro-Ed.

Nippold, M. A., Hegel, S. L., Sohlberg, M. M., & Schwarz, I. E. (1999). Defining abstract entities: Development in pre-adolescents, adolescents, and young adults. *Journal of Speech, Language & Hearing Research, 42,* 473–482.

Nippold, M. A., & Schwarz, I. E. (1992). Use and understanding of adverbial conjuncts: A developmental study of adolescents and young adults. *Journal of Speech & Hearing Research, 35,* 108–118.

Olle, R. D. (1994). Word sorts: Vocabulary development with adult literacy learners. *Journal of Reading, 38,* 230–231.

Philliber, W. W., Spillman, R. E., & King, R. E. (1996). Consequences of family literacy for adults and children: Some preliminary findings. *Journal of Adolescent and Adult Literacy, 39,* 558–565.

Qian, D. D. (1999). Assessing the roles of depth and breadth of vocabulary knowledge in reading comprehension. *Canadian Modern Language Review, 56,* 282–307.

RAND Reading Study Group (2002). *Reading for understanding: Toward a R & D program in reading comprehension.* Santa Monica, CA: RAND.

Ruddell, M. R. (1994). Vocabulary knowledge and comprehension: A comprehension-process view of complex literacy relationships. In R. B. Ruddell, M. R. Ruddell, & H. Singer (Eds.), *Theoretical models and processes of reading* (4th ed., pp. 414–447). Newark, DE: International Reading Association.

Ruddell, M. R., & Shearer, B. A. (2002). "Extraordinary," "tremendous," "exhilarating," "magnificent": Middle school at-risk students become avid word learners with the Vocabulary Self-Collection Strategy (VSS). *Journal of Adolescent and Adult Literacy, 45,* 352–363.

Schatz, E. K., & Baldwin, R. S. (1986). Context clues are unreliable predictors of word meanings. *Reading Research Quarterly, 21,* 439–453.

Shaughnessy, M. P. (1977). *Errors and expectations: A guide for the teacher of basic writing.* New York: Oxford University Press.

Singleton, D. (1999). *Exploring the second language mental lexicon.* Cambridge: Cambridge University Press.

Stahl, S. A. (1999). *Vocabulary development.* Cambridge, MA: Brookline.

Stahl, S. A., & Clark, C. H. (1987). The effects of participatory expectations in classroom discussion on the learning of science vocabulary. *American Educational Research Journal, 24,* 541–556.

Stahl, S. A., & Fairbanks, M. M. (1986). The effects of vocabulary instruction: A model-based meta-analysis. *Review of Educational Research, 56,* 72–110.

Stanovich, K. E. (1986). Matthew effects in reading: Some consequences of individual differences in the acquisition of literacy. *Reading Research Quarterly, 21,* 360–406.

Sternberg, R. J. (1987). Most vocabulary is learned from context. In M. G. McKeown & M. E. Curtis (Eds.), *The nature of vocabulary acquisition* (pp. 89–105). Hillsdale, NJ: Lawrence Erlbaum Associates.

Sticht, T. G. (1997). The theory behind content-based instruction. *Focus on Basics, 1* (D).

Taylor, M. (1992). The language experience approach and adult learners. *Eric Digest* (Report No. EDO-LE-92–01). National Center for ESL Literacy Education. (ERIC Document Reproduction Service No. ED350887)

Thorndike, E. L., & Lorge, I. (1944). *The teacher's word book of 30,000 words.* New York: Teachers College Press.

Thorndike, R. L. (1973). *Reading comprehension education in fifteen countries: An empirical study.* New York: Wiley.

Tuley, A. C. (1998). *Never too late to read: Language skills for the adolescent with dyslexia.* Baltimore: York Press.

Venezky, R. L., Bristow, P. S., & Sabatini, J. P. (1994). Measuring change in adult literacy programs: Enduring issues and a few answers. *Educational Assessment, 2,* 101–131.

Viise, N. M. (1996). A study of the spelling development of adult literacy learners compared with that of classroom children. *Journal of Literacy Research, 28,* 561–587.

Weinstein, C. E., & Mayer, R. E. (1986). The teaching of learning strategies. In M. C. Wittrock (Ed.), *Handbook of research on teaching* (pp. 315–327). New York: Macmillan.

Worthy, J., & Viise, N. M. (1996). Morphological, phonological, and orthographic differences between the spelling of normally achieving children and basic literacy adults. *Reading and Writing, 8,* 139–159.