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Vocabulary and Reading Comprehension: Direct, Indirect, and Reciprocal Influences

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At first glance, the story of how vocabulary and reading comprehension are related would seem to be straightforward: If you don't know the meanings of the words you are attempting to read, you can't comprehend the passage. But if you take the time to look a little more carefully, the story gets more complicated and more interesting. A more complete story of how vocabulary and reading comprehension are related necessarily involves consideration of direct, indirect, and reciprocal influences, and also of the possibility that they are related by virtue of being correlated with a third variable (Wagner, Muse, & Tannenbaum, 2007a).

Our article is organized into six sections. In the first section, we provide an overview of reading comprehension problems and describe the results of a recent large-scale study of relations between deficits in vocabulary and decoding and impaired reading comprehension. In the second section through fourth sections, we discuss direct, indirect, and reciprocal influences of vocabulary on reading comprehension respectively. In the fifth section, we discuss relations between vocabulary and reading comprehension that could arise by virtue of their joint correlation with a third variable. In the sixth and final section, we discuss potentially fruitful directions for future research.

Impairments in Reading Comprehension

In the early stages of reading, the vast majority of children with reading problems struggle decoding the words on the page (Wagner & Kantor, 2010). They might have other problems as well, but their inability to merely read the words on the page trumps any other problems that might become evident if they could get beyond this necessary first step. However, as children's decoding skills develop, up to half of the remaining cases of impaired reading may be attributable to sources other than poor decoding (Cain & Oakhill, 2009; Wagner, Schatschneider, & Phythian-Sence, 2009). Oakhill (1994; Yuill & Oakhill, 1991) provided early studies of individuals with poor reading comprehension yet adequate decoding skills. Nation (2009) suggests that fully 10 percent of 7–11 year-olds are poor at reading comprehension despite being accurate and fluent at decoding, based on the results of several studies (Nation & Snowling, 1997; Stothard & Hulme, 1992; Yuill & Oakhill, 1991). This phenomenon also has been observed in adult readers (Perfetti, Wlotko, & Hart, 2005; Landi

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& Perfetti, 2007). It also appears to be at the heart of the concept of late-emerging reading disabilities (Leach, Scarborough, & Rescorla, 2003).

The possibility of reading comprehension problems that are not attributed to problems in decoding is represented in a commonly used classification system for categorizing readers that is presented in Table 1. Good readers are individuals who are good at decoding and comprehension. Garden variety poor readers are poor at both decoding and comprehension. Poor decoders who do not also have problems in comprehension are considered to have specific reading disability. Good decoders who have comprehension problems are considered to have specific reading comprehension disability. How common is it for someone to be poor at reading comprehension yet adequate at decoding? Do these individuals have concomitant problems in oral language or is their comprehension difficulty limited to reading?

An apt quote from Perfetti sums up the situation: “There is room for lots of things to go wrong when comprehension fails” (Perfetti, 1994, p. 885, cited by Nation, 2005). A list of possible things that could go wrong to cause comprehension difficulties is presented in Table 2. Although all of these seem plausible sources of comprehension difficulty, only the last one—insensitivity to text structure—would seem to be specific to reading comprehension as opposed to general to both listening and reading comprehension. This fact highlights a key issue for researchers and practitioners who tackle problems in reading comprehension: Which parts of a reading comprehension problem are specific to reading and which parts are general to both oral language and reading?

Comprehensive reviews of the strengths and weaknesses of individuals with poor comprehension and adequate decoding have been provided by Cain and Oakhill (2007) and Nation (2005). Deficits have been reported in making inferences, monitoring comprehension, working memory, listening comprehension, and in other aspects of oral language (Nation & Snowling, 1997; Nation, 2009). Cain and Oakhill (2009) reviewed three kinds of studies that support causal influenced—comprehension-age match comparisons, training studies, and longitudinal correlational studies—and concluded that there is evidence for causal influences on reading comprehension for inference making, comprehension monitoring, and understanding story structure.

A recent large-scale study provides some relevant information to the question of the nature of reading comprehension problems (Wagner, 2010). The sample was drawn from Reading First schools throughout the state of Florida. Reading First has been the largest Federal program targeting students who are at-risk for being poor readers. The program served students similar to those targeted by Title 1 and Chapter 1 programs. The sample was diverse with approximately a one-third Black, a one-third White, and one-fourth Hispanic. Approximately three-fourths of the students were eligible for free or reduced lunch.

Three measures were used in the study. Reading comprehension was measured with the reading comprehension section of the Stanford Achievement Test (SAT 10). This is a typical group administered measure that assesses achievement in several domains including reading comprehension. Decoding fluency was measured by DIBELS Nonsense Word Fluency (5th

Edition; Good, Kaminski, Smith, Laimon, & Dill, 2001). This task requires the student to read aloud vowel-consonant and consonant-vowel-consonant single-syllable pseudowords. Alternate-forms reliability coefficients for the measure range from .8 to .9, and validity coefficients for predicting various forms of reading range from .4 to .9 (Speece, Mills et al., 2003). Vocabulary was measured by the Peabody Picture Vocabulary Test (3rd Edition; Dunn & Dunn, 1997). Reliability coefficients for the test are at the .9 level, and validity coefficients for predicting scores on other vocabulary measures are also reported to be at the .9 level in the examiner's manual.

The analyses proceeded in three steps. First, students who were poor at reading comprehension were identified using the criterion of scoring at or below the 5th percentile on reading comprehension. Second, from the group of students who were poor at reading comprehension, students who were poor at reading comprehension yet adequate at decoding were identified using the criterion of scoring at or above the 25th percentile on decoding fluency. Third, from the group of students who were poor at reading comprehension yet adequate at decoding, students who were poor at reading comprehension yet adequate at decoding and at vocabulary were identified using the criterion of scoring at or above the 25th percentile on vocabulary.

Beginning with the first grade sample, 4.73 percent of the sample or 1,669 students were identified as being poor at reading comprehension. Of the 1,669 students who were poor at reading comprehension, only 0.24 percent or 85 met the criterion on being adequate at decoding. This result supports the idea that decoding is the primary stumbling block for beginning readers. Of the 85 students who were poor at reading comprehension yet adequate at decoding, only 0.07 percent or 23 were adequate at vocabulary.

Turning to the second grade sample, the results were very different in one regard and very similar in another. Of the second-grade sample, 4.27 percent or 1,403 students were identified as being poor at reading comprehension. However, in contrast to the first-grade results, almost half—2.25 percent or 735 students—were adequate at decoding. This result supports the contention that half of students who are beyond the initial stage of learning to read and poor at comprehension have problems other than decoding. However, consistent with the first-grade results, only 0.22 percent or 72 students were adequate at vocabulary.

Summarizing these results, virtually no first-grade students who are poor at reading comprehension are adequate decoders. By second grade, about half of students who are poor at reading comprehension are adequate decoders, but 9 out of 10 students who are poor at reading comprehension yet adequate at decoding are poor in vocabulary.

Although it is tempting to conclude from this study that poor vocabulary is the cause of the reading comprehension problems for adequate decoders, such a conclusion may be premature. There are a number of other plausible explanations for observed relations between vocabulary and reading comprehension (Nagy, 2007; Nation, 2009). For example, vocabulary could influence reading comprehension indirectly through mediators such as phonological awareness and decoding (Lonigan, 2007). A third possibility is that of a reciprocal causal relation in which reading comprehension influences vocabulary because a

substantial amount of vocabulary knowledge is acquired from reading print as opposed to listening to speech. Finally, vocabulary and reading comprehension might be related because they both are correlated with some third variable. For example, Anderson and Freebody's knowledge hypothesis suggests that conceptual knowledge is what really drives comprehension, and vocabulary can be thought of as the visible tip of the conceptual knowledge iceberg (Nagy, 2007). In subsequent sections, we consider direct, indirect, reciprocal, and third-variable correlational relations in turn.

Direct Influences of Vocabulary on Reading Comprehension

Evidence of potential direct influences of vocabulary on reading comprehension comes from training studies in which intervention programs were provided to improve vocabulary and reading comprehension was included as an outcome. It is important to note that training studies could miss direct influence of vocabulary on reading comprehension if (a) vocabulary did exert a direct influence but was not impacted by training, (b) vocabulary was impacted by training but transfer to reading comprehension did not happen automatically, or (c) both. Three reviews of the literature provide at least modest support for a direct influence of vocabulary on reading comprehension.

The National Reading Panel (NRP) (National Institute of Child Health and Human Development, 2000) carried out a review of all published experimental and quasi-experimental studies of the effects of vocabulary instruction. Although gains on standardized measures of reading comprehension as a consequence of reading instruction were found for only two studies, the panel generally supported vocabulary instruction and called for more sensitive measures of vocabulary knowledge.

Stahl and Fairbanks (1986) reported the first large-scale meta-analysis of the effects of vocabulary interventions. They reported a large average effect size for vocabulary intervention of 0.97 for comprehension outcomes designed by the researcher to be sensitive to the intervention, and a modest yet statistically significant effect size of 0.30 for standardized tests of reading comprehension. Three moderators that explained variability in effect sizes across studies were identified. Larger effect sizes were associated with activities requiring more depth of processing, pairing contextual and definitional information, and the type and number of word exposures.

Elleman, Lindo, Morphy, and Compton (2009) reported the most comprehensive and technically adequate review to date. Their review was a meta-analysis of 37 studies reporting effects of vocabulary instruction on passage-level comprehension. The meta-analysis included studies of vocabulary instruction provided in grades pre-k up to grade 12. The results of the meta-analysis address two questions of interest to the present discussion.

The first question of interest is the magnitude of the effects of vocabulary instruction on vocabulary outcomes. If the effects of vocabulary instruction on vocabulary outcomes are minimal, there would be little reason to expect the effects of vocabulary instruction to generalize to reading comprehension outcomes. Effect sizes are interpreted in standard deviation units. For example, an effect size of 1.00 means an improvement of one standard deviation in performance on an outcome measure for the experimental group compared to a

control group. For standardized vocabulary tests, the effect sizes for vocabulary instruction ranged from −0.24 to 0.46, with an average weighted effect size of 0.29. This average weighted effect size was significantly different from 0. For researcher-developed custom vocabulary measures, the effect sizes ranged from -0.11 to 2.28, with an average weighted effect size of 0.79. This effect size also was significantly different from 0.

The second question of interest here is whether vocabulary instruction affects passage-level reading comprehension, and if so, which characteristics of participants and of the intervention predict variability of effects sizes across studies. The results mirrored those for vocabulary outcomes just described, although the effects were muted. For standardized measures of passage-reading comprehension, the effect sizes ranged from -0.26 to 0.43, with an average weighted effect size of 0.10. The average weighted effect size was not significantly different from 0. Turning to custom measures of reading comprehension that were created by the researchers, the effect sizes ranged from −0.06 to 1.46, with an average weighted effect size of .50. This average weighted effect size was significantly different than 0.

What kinds of instruction are effective at teaching vocabulary words? Beck and McKeown (1991, 2007) have summarized what is known about effective vocabulary instruction. All instructional methods that have been examined produce better word learning than no instruction, at least for the instructed words. No one method has been shown to be superior to other methods, but some characteristics of effective vocabulary instruction are presented in Table 4. They can be summarized by the commonsense admonition that better learning of new vocabulary words happens when their meanings are processed deeply, more than once, and in multiple contexts.

In summary, the results of three studies suggest there are small direct effects of vocabulary on reading comprehension. The modest size of these effects is suggested by the fact that the effects are observed reliably for researcher-developed measures, but not for standardized measures of reading comprehension which presumably are less sensitive to small effects. Some common sense characteristics of effective vocabulary instruction have been identified.

Indirect Influences of Vocabulary on Reading Comprehension

Phonological awareness refers to having access to the sound structure of oral language (Adams, 1990; Stanovich, 1992; Wagner & Torgesen, 1987). Examples of tasks that measure phonological awareness include elision (“Say cart.” Now say cart without saying /t/.”), blending (“What word do these sounds make: /t/ /a/ /k/.”), and sound matching (“Which word begins with the same sound as rat: cot, ham, or run?”). Children well-developed phonological awareness learn to read more easily than do children with poorly-developed phonological awareness, even controlling for potential confounding variables such as IQ, socioeconomic status, and receptive vocabulary (Bryant, MacLean, Bradley, & Crossland, 1990; Lonigan, 2007; Wagner, Torgesen, & Rashotte, 1994).

Why is an oral language skill such as phonological awareness related to early reading? One reason that oral language skills in general, and phonological awareness in particular are related to reading is that reading and writing are too recent to have been selected for by

human evolution. Although cave paintings can be traced back about 50,000 years, the earliest evidence of written language comes from Sumeria (modern Iraq and Iran) about 6,000 years ago (Crowder & Wagner, 1991). The evidence comes from the discovery of fired clay tokens that appear to represent goods in an agricultural economy. Farmers needed a way to protect agricultural goods that were sent to settlements. A system was developed in which hollowed clay balls called bullae were formed with clay tokens representing amounts of goods sealed inside. The bullea, which served as safety deposit boxes, were sent with the goods. When the shipment reached the settlement, the bullae would be broken open and compared with the goods in the shipment to make sure that all of the goods had arrived safely. It became useful to know what was inside the bullae without breaking it open so that the shipment could be checked along the way, so marks began to be inscribed on the outside of the bullae that represented the tokens inside. Once inscriptions on the outside of the bullae were accepted as representing the tokens inside, people realized that there no longer was a need to go through the trouble of sealing tokens in hollow bullae. They could exchange inscribed pieces of clay instead. This marks the birth of a writing system.

The way reading is possible without the benefit of human evolution is by recruiting areas of the brain that developed for other purposes. These areas primarily involve speech, language, and vision. The visual aspects of reading seem rarely to be challenging. In contrast, deficits in the phonological or speech-sound system appear to be universal. Performance on phonological processing tasks is predictive of early reading regardless of the form of the written script (Caravolas, 2005). However, it is an especially good predictor of early reading of alphabetic scripts such as English because letters correspond roughly to sounds. Thus, cat, rat, and hat have different initial sounds and identical medial and final sounds. These similarity and differences are reflected in their spellings.

Although it used to be assumed that phonological processing was modular and therefore independent of vocabulary knowledge, vocabulary knowledge is related to phonological processing at both the preschool and school-age levels (Bowey, 1994; Chaney, 1992; Cooper, Roth, Speece, & Schatschneider, 2002; Wagner, Torgesen, Laughon, Simmons, & Rashotte, 1993; Lonigan, 2007; Lonigan. Burgess, & Anthony, 2000; Wagner et al., 1997).

Further evidence of a relation between vocabulary knowledge and phonological processing comes from comparing performance on phonological processing tasks involving word stimuli with performance involving nonword stimuli. For example, the Comprehensive Test of Phonological Processing (Wagner, Torgesen, & Rashotte, 1999) has both word and nonword versions of phonological blending and phonological segmentation. It is possible to compare performance on comparable word and nonword items. Doing so makes clear that it is more difficult to do phonological processing on nonword items than on word items. Given evidence of relations between (a) vocabulary and phonological processing tasks, (b) phonological processing and decoding, and (c) decoding and reading comprehension, a plausible indirect influence of vocabulary on reading comprehension is via the mediating route of phonological processing and decoding.

In addition, comparing performance on the Word Reading Efficiency and Phonemic Decoding Efficiency subtests of the Test of Word Reading Efficiency (Torgesen, Wagner, &

Rashotte, 1999) reveals a similar advantage for word-based stimuli over nonword-based stimuli for decoding. This suggests the plausibility of an indirect route of vocabulary on reading comprehension via decoding alone (Plaut, McClelland, Seidenberg, & Patterson, 1996).

Reciprocal Influences of Reading Comprehension on Vocabulary

Estimates of the rates at which new vocabulary words are acquired vary considerably, from a low estimate of 2.2 words per day to a high estimate of 9 words per day (Biemiller & Slomin, 2001; Carey, 1878; Templin, 1957). Beck, McKeown, and Kucan suggest 7 words per day as the most commonly cited rate of vocabulary acquisition.

Opinions also differ about the proportions of new words that are acquired from direct instruction as opposed to learning from context via either listening comprehension or reading comprehension (Phythian-Sence & Wagner, 2007). For example, Biemiller (2001) believes that more than half of new vocabulary words—and perhaps as many as 80 percent—are learned as a result of direct instruction. Most others believe that more words are learned from context than from direct instruction (Leung, 1992; Nagy, Herman, & Anderson, 1985; Osborn & Armbruster, 2001; Sternberg, 1987). Regardless of disagreement about the proportions of vocabulary words acquired from direct instruction versus learning from context, there is consensus that a substantial number of new vocabulary words, and perhaps the majority of them, are learned from context.

Initially, vocabulary learning from context occurs as children hear oral language, either from conversation or from listening to books read aloud (Leung, 1992; McKeown, 1985; Werner & Kaplan, 1950). As children get older, learning words from context extends to reading (Jenkins, Stein, & Wysocki, 1984; Nagy et al., 1985; Shore & Kemp, 1999). Although there is some evidence that strategies can be trained that result in modest improvement in skill at inferring meaning from context (Fukkink & de Glopper, 1998; Sternberg & Powell, 1983), pronounced individual differences exist and individuals who are poor at reading comprehension also struggle with inferring the meaning of new words encountered in text.

Cain, Lemmon, and Oakhill (2004) had children read short stories that contained a single exposure to a novel word. The meaning of the novel word could be inferred from context, either from information in the text that occurred right after the novel word in a near condition, or after several sentences of filler text in a far condition. Compared to good comprehenders, poor comprehenders were less able to explain the meanings of the novel words, with a larger difference found for the far condition than for the near condition. The finding that poor comprehenders do not learn words from context as well as good comprehenders now has been replicated across many ages and settings (Nation, Snowling, & Clarke, 2007; Perfetti, Wlotko, & Hart, 2005; Ricketts, Bishop, & Nation, 2007).

In summary, individual differences in reading comprehension are associated with differences in the ability to acquire new vocabulary words from context. Because a substantial number of vocabulary words are learned from context as opposed to direct instruction, relations between reading comprehension and vocabulary are reciprocal: A rich vocabulary assists in fully comprehending written and oral language; skilled comprehenders

in turn are better able to infer the meanings of vocabulary words from context. Although the influence of reading comprehension on vocabulary acquisition has primarily been demonstrated in studies that present novel words to control for individual differences in prior knowledge of the target word, it is highly likely that the meanings of many words that are "known" become sharpened as a result of coming across them in different contexts.

Third-Variable Relations between Vocabulary and Reading Comprehension

Anderson and Freebody (1981) described three hypotheses about how vocabulary and reading comprehension might be related. One of the three—their instrumental hypothesis—implied a causal relation between vocabulary and reading comprehension in which knowing the meanings of the words you are reading better results in better reading comprehension. Their other two hypotheses—the knowledge hypothesis and the aptitude hypothesis—represent non-causal relations between vocabulary and reading comprehension that result from the joint relations with a third variable.

According to the knowledge hypothesis, conceptual knowledge is a critical determinant of how effectively one reads for comprehension. Vocabulary is viewed as a limited aspect of conceptual knowledge, and vocabulary is related to reading comprehension only because it is part of conceptual knowledge.

According to the aptitude hypothesis, vocabulary and reading comprehension are related because individual differences in each are caused by a common aptitude or set of aptitudes. For example, the general factor (*g)* that underlies performance on most all cognitive tasks explains variance on measures of both vocabulary and reading comprehension. People who score highly on IQ tests tend to have extensive vocabulary knowledge and to do well on reading comprehension tests.

Nagy (2007) makes a convincing case for a specific version of Anderson and Freebody's (1981) aptitude hypothesis. The aptitude in question is not *g*, however, but rather metalinguistic awareness. Metalinguistic awareness refers to the ability to reflect on and manipulate the structure of oral language (Tunmer, Herriman, & Nesdale, 1988). Examples of metalinguistic awareness include phonological awareness, morphological awareness, and syntactic awareness. Nagy makes that case that metalinguistic awareness plays a causal role in the development of vocabulary knowledge and in the development of reading comprehension.

Regarding a casual role for metalinguistic awareness in the development of vocabulary knowledge, the form of metalinguistic awareness that is central to vocabulary development is morphological awareness. Morphological awareness refers to knowledge about word roots, prefixes, and suffixes (Carlisle, 2007). Morphemes refer to the smallest units of word meaning. The ability to productively combine morphemes is viewed as an important skill in inferring meanings of new vocabulary words (Carlisle, 2007; McBride-Chang, Shu, Ng, Meng, & Penney, 2007; McBride-Chang, Wagner, Muse, Chow, & Shue, 2005). For example, the word "brush" contains a single morpheme that refers to the action of moving something with an object or to the object that is doing the moving. "Tooth" contains a single morpheme that refers to the hard objects in our mouths that are used for chewing and biting.

When the word “toothbrush” is encountered, its meaning can be derived by combining the morphemes associated with “brush” and “tooth.” In practice, the meaning of the word “toothbrush” may be acquired prior to the meaning of “brush,” or the word “brush” may be learned initially as specific to hair brush. With development of morphological awareness and exposure to words in context, word meanings are clarified.

Regarding a causal role for metalinguistic awareness in the development of reading comprehension that is independent of its important role in the development of vocabulary, Nagy (2007) describes several possibilities. First, metalinguistic awareness itself can be conceptualized as a form or metacognition, and therefore related to comprehension monitoring. Second, metalinguistic awareness in the form of syntactic awareness can be important for comprehending convoluted sentences such as “The dog that bit the owner of the deli belonged to his sister-in-law’s hairdresser.”

Promising Directions

Our review of relations between vocabulary and reading comprehension reveals a rich literature that describes a complex system of direct, indirect, reciprocal, and correlational relations between vocabulary and reading comprehension. However, much remains to be learned. Given what we have learned already, what are promising directions for future research?

Wagner, Muse, and Tannenbaum (2007b) identified exploring underlying dimensions of individual and developmental differences in both vocabulary knowledge and reading comprehension as a promising direction for future research. Justification for this as a promising area for future research was the belief that it might lead to better measures of both vocabulary and reading comprehension. Current measures of vocabulary have been criticized as insensitive to the relatively small effects that might reasonably be obtained from training that occurs over a moderate time interval. In addition, the rationale for determining which words belong on vocabulary tests is limited and uninformed by recent research on differences among words (Beck & McKeown, 2007; Beck, McKeown, & Kucan, 2002; Coyne et al., 2004). Similarly, existing measures of reading comprehension differ considerably in the mix of skills that they assess (Cutting & Scarborough, 2006; Keenan, Betjemann, & Olson, 2008).

Related to the issue of measures of vocabulary, there may be a problem that is much more profound than which words should occur on vocabulary tests: Does the individual vocabulary word represent the right unit of analysis? Most vocabulary tests consist of presenting individual words and obtaining responses that are scored as correct or incorrect, or perhaps with relatively crude differentiation between a “2-point” response and a “1-point response” (Beck et al., 2002) In fact, vocabulary knowledge is much more complex (Phythian-Sence & Wagner, 2007). Knowledge about words is not an all or none phenomenon, but is better conceptualized on continua that represent degrees of understanding of multiple senses of word meaning (Anderson & Ortony, 1975; Beck, McKeown, & Omanson, 1987; Cronbach, 1942; Dale, 1965; Graves, 1987; Nagy & Scott, 2000; Shore & Durso, 1990). Learning something new about a word or concept sharpens the

meanings of semantically related items. For example, learning that oil and water do not mix enriches one's understanding of the fact that waterfowl have oil glands.

Another area of promising research is to consider the acquisition of vocabulary knowledge and reading comprehension from the vantage point of skills acquisition and expertise (Wagner & Stanovich, 1996). Most research on improving either vocabulary knowledge or reading comprehension is conceptualized and carried out in an educational context that is isolated from large bodies of potentially relevant research on skill acquisition and the development of expertise in other domains. Conceptualizing the acquisition of vocabulary knowledge and reading comprehension as important examples of skill acquisition and development of expertise might fruitfully inform both the educationally-oriented research on vocabulary knowledge and reading comprehension and the study of skill acquisition and the development of expertise more generally.

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Table 1

Classifying Readers on the Basis of Decoding and Comprehension

	Good Decoding	**Poor Decoding**
Good Comprehension	Good Reader	Specific Reading Disability
Poor Comprehension	Specific Reading Comprehension Disability	Garden Variety Poor Reader

Table 2

Possible Causes of Comprehension Difficulties

1	Decoding difficulties.
2	Difficulties with meaning (vocabulary).
3	Difficulties with syntax.
4	Limitations in working memory.
5	Poor inference making.
6	Inadequate comprehension monitoring.
7	Limited prior domain knowledge.
8	Insensitivity to text structure.

Table 3

Frequencies of First- and Second-Grade Students who are Poor at Reading Comprehension yet Adequate in Decoding and Vocabulary

First Grade	Frequency	Percent
Total Sample Size	35,314	100.00
Poor Reading Comprehension	1,669	4.73
Yet Adequate Decoding	85	0.24
Yet Adequate Vocabulary and Decoding	23	0.07
Second Grade	**Frequency**	**Percent**
Total Sample Size	32,820	100.00
Poor Reading Comprehension	1,403	4.73
Yet Adequate Decoding	735	2.25
Yet Adequate Vocabulary and Decoding	72	0.22

Table 4

Characteristics of Effective Vocabulary Instruction

1	Words should be introduced using everyday language as opposed to dictionary definitions.
2	Providing a vocabulary word in multiple contexts is preferable to a single context.
3	Instructional activities should promote deep rather than shallow processing of meaning.
4	Multiple exposures are better than single exposures to new words.
5	Encourage students to attend to occurrence of new vocabulary words in settings outside of the classroom.