One of the cornerstones of literacy is acquiring vocabulary. Although there is agreement on the importance of vocabulary to becoming literate, there is little consensus among researchers on how an effective vocabulary should be built. For example, some advocate teaching word meanings directly; others suggest that skills in deriving meaning from context should be taught, while yet others believe that specific words need not be taught, as vocabulary is naturally acquired by encountering new words during reading and other verbal enterprises. One reason there is such diversity in suggested approaches is that researchers focus on different aspects of vocabulary skill and knowledge, such as the size of an effective vocabulary, the multi-faceted nature of vocabulary, the ability to use context to acquire word meanings, the relationship between vocabulary knowledge and reading comprehension, and more.

A point that is fundamental to the vocabulary research we have been engaged in over the past several years, and the positions we take in this article, is that vocabulary knowledge is multi-faceted. That is, knowing a word is not an all-or-nothing proposition. Rather, there is probably a continuum from complete unfamiliarity — zero knowledge — to a trace of knowledge, to accurate but narrow knowledge, to fluent and rich knowledge. Therefore, to make a decision about what kind of vocabulary instruction is most optimal, we first have to establish the level of knowledge or the criterion behavior to which the instruction is aimed. If, for example, the criterion is the ability to associate a word with its definition or synonym, a different type of instruction might be considered than if the criterion is the comprehension and interpretation of connected discourse.

The work we will discuss first has been from the latter approach and has resulted in what we call "fertile" instruction. To describe why we consider this type of vocabulary instruction as fertile, we focus on three characteristics: (1) the aspects of vocabulary knowledge and use that fertile instruction is aimed to enhance, (2) the types of words that are the candidates for instruction under this approach, and (3) the population of learners for whom the instruction is targeted.

Regarding aspects of vocabulary knowledge, we have hypothesized that the semantic processes involved in reading comprehension require accuracy of word knowledge, fluency of access to meanings in memory, and rich semantic network connections among related concepts. In order to influence reading comprehension and other complex verbal functions, instruction must improve all three of these processing components. Toward this end, it should aim at an exploration of each word's meaning and related ideas to yield a deeper knowledge of words.

From the three characteristics of our approach just presented, a role for fertile vocabulary instruction can be derived. That role is to increase knowledge of word definitions, provide a variety of semantic links to words, and promote greater facility in using words. Thus, the question that must be addressed is whether instruction can fulfill this role. From three studies we have done, we have evidence that the fertile instruction we created did so. We move now to an outline of the instruction and the evidence of its success.

This fertile instruction presented words in semantic groups of 8-10 words. For example, one labeled Moods included jovial, indignant, and enthusiastic. Each set of words was taught over a week's time, in which the activities grew more challenging each day. The instruction was designed to include a range of task requirements that not only encompassed but went well beyond matching words with definitions. Activities included associating new words with contexts that did not contain definition elements, but presented consequences, examples, or typical actions associated with the taught words. Children were sometimes asked to create contexts for words, such as discuss what a tyrant might have a nightmare about, or describe a time when they had consolated someone. Another type of activity involved comparing and contrasting words to discover relationships, such as answering, "Would you berate
someone who inspired you?" or "Would you want to baffle someone who tried to snare you?" Our rationale was that requiring students to manipulate words in varied and rich ways would produce a deeper understanding of the words and more flexibility in using the words. The activities were mostly whole-class, and provided for a great deal of discussion and interaction around the words.

Another component of the instruction was an activity to motivate the children to carry their vocabulary learning beyond the classroom. In this activity, called "Word Wizard," children could earn points toward becoming a Word Wizard by reporting the context in which they had seen, heard, or used an instructed word outside of class. The purpose of the "Word Wizard" activity was to provide extrinsic motivation for children to extend their learning of the words presented in the program to nonschool activities.

How successful was this instruction? The goals of the instruction were to produce word skill that was rich and proficient enough to facilitate complex verbal tasks such as reading. There are many aspects of word skill that are important. The ones we focused on in the first two of these studies were accurate knowledge of word meanings and accessibility of word meanings during processing.

In our studies, we found, first, that children gained an accurate knowledge of the definitions of the words taught as measured by multiple-choice tests. On mastery tests given at the completion of each week's instruction, the children knew about 95 percent of the instructed words. On a posttest given three weeks after all instruction had been completed, they still knew 80 percent of the words.

Second, as a result of the instruction, the children were able to access instructed word meanings faster as measured by their reaction time on word-categorization tasks. That is, children were shown a word on a screen and asked to press a "yes" or "no" button to indicate if the word was, for example, "a person." This result suggests that the words were learned well enough to be readily available for complex processing tasks.

Given that the instruction enhanced accuracy and fluency, and presented opportunities to develop rich word knowledge, one might expect that reading comprehension would be improved for stories containing instructed words. This was indeed the case as measured by recall and answers to multiple-choice questions. Thus, not only did children show improvement in specific components of vocabulary skill that are likely prerequisites of more complex tasks such as reading, they also showed improvement in reading comprehension itself.

The instruction we designed for the first two studies had three important dimensions: (1) frequent encounters with the words being taught, (2) richness of instruction, and (3) extension of activities beyond the classroom. In a third study, we examined the relative contributions of these dimensions by comparing traditional instruction, which required only associations between words and definitions, with rich instruction and extended rich instruction, which added activities to extend learning beyond the classroom. Frequency was manipulated by providing either four or 12 encounters with instructed words.

Another aspect that we added to this third study was that we presented a task to assess context interpretation, an aspect of verbal proficiency that is not easily revealed through recall of text, as well as measures of accurate knowledge of definitions, fluency of access, and reading comprehension. The task is based on a problem that young learners sometimes exhibit in being unable to integrate a word's meaning into the surrounding context to develop an appropriate representation of the context as a whole. Such a problem is particularly apparent when the surrounding context does not strongly call to mind the target word. For example, consider the following scenario containing the instructed word commend: "When father heard that Lisa had ripped up the letter from Steve, father commended her for it." This is not a stereotypical context for commend in that one does not usually think of being commended for destroying something in anger.

The task we presented consisted of scenarios such as the commend one, followed by a question that required an understanding of the implications of the target word within the context. The question for the commend scenario was, "What do you think father thought of Steve?" To answer this question, one must infer that father approved of Lisa's action, and, therefore, must not think much of Steve.

The results of this study showed, first of all, that high-frequency instruction produced better performance than low-frequency instruction for all measures. Regarding the type of instruction, no difference was found for accuracy of definition knowledge among the traditional, rich, and extended/rich instruction. For fluency of access to word meanings, extended/rich instruction showed advantage over rich and traditional instruction, and for context interpretation and story comprehension, extended/rich and rich instruction showed advantage over traditional instruction.

Thus, we have evidence of the different results that can be obtained by different kinds of instruction. A more narrow, traditional instruction is sufficient for promoting knowledge of definitions, while more elaborated
instruction is needed to promote the complex verbal processing represented by our story comprehension and context interpretation tasks. What is the difference in word knowledge that allows more complex processing? A clue to the difference can be found in the results of the context interpretation task in which children who received rich or extended/rich instruction were better able to respond to the questions that followed the scenarios. A tendency for children who received the narrow instruction was to react by defining the target word rather than responding to the situation presented. This suggests they did not have a network of associations readily available for the target word which they could draw upon in establishing an interpretation of the situation. Instead, they had to rely on the simple link that had been established between the word and its definition.

Although the results of our studies have shown the advantages of fertile instruction, we do not conclude that all vocabulary instruction must take place in a fertile environment. There is indeed a place for teaching words more narrowly. For example, classroom time is limited and the teacher may wish to devote less time in order to introduce more words. Such instruction can leave a trace of meaning about words and may initiate the process of knowing a word. Then the next time the word is encountered, more information about its meaning can be gathered. Another role for more narrow instruction is that teachers may, on occasion, wish to teach enough about a word for it to be useful for a specific purpose, such as in a social studies lesson or reading selection, but not be concerned with maintaining its meaning. In using narrow instruction, however, teachers do need to be aware of its limitations.

The point is that a determination of what kind of vocabulary instruction is best depends on the goal of the instruction. Another factor that underlies a decision as to the most appropriate kind of vocabulary instruction is the words being taught.

The fertile instruction we developed was not intended to be appropriate for all types of words. To elaborate, consider a mature, literate individual's vocabulary as comprising three tiers. The first tier consists of the most basic words: cat, mother, go, red, talk, chocolate, etc. It would be difficult to argue that any direct instruction be devoted to the meanings of these words in school. The third tier consists of words whose frequency of use is quite low, or which apply to specific domains. This tier might include words such as divertimento, nebula, resistivity, nonrestrictive, and tidal pool. In general, a rich conceptual knowledge of such words would not be of high utility for most learners. These words are probably best learned when a specific need arises, such as presenting nebula during a lesson or discussion of the solar system.

Now, to return to the second tier. It is this tier that contains words of high frequency for mature language users. They are also words of general utility, not limited to a specific domain. Some examples might be unique, convenient, retort, influence, ponder, and procrastinate. It is words of this type toward which the most productive instructional efforts can be directed. Because of the role they play in a language user's verbal repertoire, rich knowledge of words in this second tier can have a significant impact on verbal functioning.

The notion that fertile instruction is targeted for certain words has another important implication. It limits the number of words to be considered for instruction, thus alleviating the concern that direct instruction is fruitless because of the great number of words in the English vocabulary.

It is difficult to get a handle on how many words or what percentage of a vocabulary repertoire would be included in this second tier, but we have made an initial attempt to estimate it as follows, using data from Nagy and Anderson's analysis of words in printed school English for grades three through nine. Nagy and Anderson estimate that good readers of this age range may read a million words of text a year. They also estimate that half of the 88,500 word-families they calculate to exist in printed school English are so rare that they may be encountered no more than once in an avid reader's lifetime. With these figures in mind, it seems reasonable to consider words — or, rather, word-families — that would be encountered once in ten years, namely those that occur once or more in ten million running words of text, as comprising tiers one and two. That translates into about 15,000 word-families. A stab at estimating tier one, those most familiar words that need no instruction, would be 8,000 word-families. We have chosen this figure because Nagy and Anderson state that it may be reasonable to assume that a third-grader already knows 8,000 words. That gives us about 7,000 word-families for tier two which we want to focus on. Based on the third study we described earlier, which presented 12 encounters as the high-frequency condition, we estimate that the number of words that could be taught, in a rich way, per school year is about 400. Teaching 400 words per year over grades three to nine would provide rich knowledge for 40 percent of the word-families that make up tier two.

This estimate must be presented with a cautionary note: it is only an attempt to get a handle on a possible figure for the words we would focus on. No degree of precision can be assumed. Yet, it is useful for making two
important points. First, nowhere near all the words that are available in print or oral contexts would be candidates for the kind of instruction we have in mind. Second, providing rich conceptual networks for a portion of words that would be good candidates — approximately 40 percent of them — is a significant contribution to the verbal functioning of an individual.

The significance of this contribution is particularly apparent in light of another factor to be considered in choosing vocabulary instruction, the target population of learners. The kind of instruction we describe as fertile is particularly targeted for those children in the lower half of the distribution in both reading skill and SES. For example, in our original vocabulary style, the subjects were fourth-graders from an urban school, and 79 percent of them were below the 50th percentile on standardized pretests in reading comprehension and vocabulary. It is this type of child who is less likely to acquire — and become proficient in using — rich conceptual networks of tier-two words independently. We base this statement on two sets of evidence and a conjecture.

The first set of evidence about richness of vocabulary knowledge comes from work by Curtis and Glaser. They found that students of lower ability knew not only fewer words, but had more narrow knowledge of words with which they were familiar.

The other evidence and conjecture are concerned with the issue of how the acquisition and proficient use of rich vocabulary knowledge might develop without
specific in-school instruction. One way is through extensive reading, where familiar words are encountered in new and varied contexts and each new context presents a potential new facet of that word's network. However, the children we are talking about are the less-able readers. Not only are these children less likely to read extensively, but evidence shows that they are not particularly facile in deriving word meaning information from context. Specifically, McKeown found that less-skilled fifth-graders were less able to identify concepts from context that constrained the meaning of an unfamiliar word, less able to evaluate the meaning of a word even when correct constraints were identified, less able to take advantage of multiple contexts that used the unknown word, and less able to identify the meaning of the word after a series of context clues had been presented. In addition, even after the meaning of a word was identified or presented, less-skilled children were less able to identify correct use of the word in subsequent contexts. Thus, the power of increasing vocabulary through reading is significantly diminished for less-able readers.

In addition to extensive reading, another way rich networks might develop is through accumulated experiences of hearing and using new words in oral contexts. Our conjecture is that the use of and encouragement to use a more sophisticated vocabulary does not commonly characterize the informal verbal environment of our target children.

To evaluate vocabulary instruction one must realize that different types of instruction have different purposes. A decision about vocabulary instruction should consider the type of knowledge that is the goal of instruction, the type of words to be taught, and the characteristics of the learners. If vocabulary instruction is intended to foster higher-level verbal processing, then instruction must attend directly to various components of word skill required for such processing. This is particularly important for less-skilled readers because the habits and reading environments of these children are less likely to result in a satisfactory level of verbal performance without instruction.

Footnotes


3 McKeown, M.G. "The Acquisition of Word Meaning from Context by Children of High and Low Ability," in Reading Research Quarterly, in press.


Isabel L. Beck is Professor of Education at the University of Pittsburgh and a Senior Scientist at the Learning Research and Development Center, University of Pittsburgh, where she is Co-Director of the Reading and Comprehension Unit. Her current research interests include vocabulary development, reading comprehension, and computer-assisted reading instruction. Dr. Beck may be contacted at the Learning Research and Development Center, University of Pittsburgh, Pittsburgh, PA 15260.

Margaret G. McKeown is a Post-Doctoral Fellow at the Learning Research and Development Center, University of Pittsburgh. She received her PhD in education from the University of Pittsburgh in 1983. Her research interests include vocabulary development, reading comprehension, and computer-assisted reading instruction. Dr. McKeown may be contacted at the Learning Research and Development Center, University of Pittsburgh, Pittsburgh, PA 15260.

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