Research Into Practice READING

Keys to Early Reading Success: Word Recognition *and* Meaning Vocabulary

Crabs are arthropods, a very large group of animals that have an external skeleton and jointed legs. Other kinds of arthropods are insects, spiders, and centipedes. Blue crabs belong to a particular arthropod group called crustaceans. Crustaceans are abundant in the ocean, just as insects are on land.

The blue crab's shell is a strong armor. But the armor must be cast off from time to time so the crab can grow bigger. Getting rid of its shell is called molting.

Hard passage? Yes, but it is what fourth-grade children can be expected to encounter on high-stakes assessments and in upper-grade textbooks. To take in the potentially new information about crustaceans, or for that matter, the consideration of how crabs grow, requires that a child bring to the text a considerable amount of skill and knowledge. The child must be able to read most of the words accurately, attach meaning to them, and reason through some difficult, and probably new, concepts. This particular text is an excerpt from an 800-word article that was originally published in *Highlights for Children*. It appeared on the 1998 National Assessment of Educational Progress (NAEP), and it is now used to illustrate the types of texts fourth-grade students will be asked to read on this national assessment. Most children will find the text difficult. Indeed, it is intended to be difficult. The NAEP attempts to measure learning through reading—that is, to gauge comprehension and new knowledge gained from reading the text, not just the knowledge a child brought into the testing room. It attempts to measure what we hope reading can do for children—provoke thinking and growth in knowledge.

Thirty-seven percent of fourth-grade children nationwide scored below a basic level in reading on the 2003 NAEP. They could not comprehend passages like the one above at even a minimal level. For children from low-income families who qualify for a free or reduced-price lunch in the United States, the scores are even more disturbing: 56% of eligible children scored below the basic level in reading, compared to 25% of ineligible children (http://nces.ed.gov/nationsreportcard/reading/results2003/). The percentages of different ethnic groups scoring below the basic level on the NAEP were as follows: white, 26%; black, 61%; and Hispanic, 57%.

Connie Juel

Connie Juel is a professor of education at Stanford and serves on the editorial board of Reading Research Quarterly. *She was elected to the International Reading Association's Reading Hall of Fame in 2001. Dr. Juel is a program author for* Reading Street.

PEARSON Scott Foresman

The Language Gap

My point here is not to lament the number of children who fail to learn about crabs from reading a test. I use the example simply to demonstrate how learning about the world can be limited by reading skill, language, and knowledge. Why do so many children struggle to understand texts like these? Some children probably can't decode the words. Many more, though, probably fail to understand enough of the words even to have a chance at gaining the new knowledge offered by the text. Carver and Leibert (1995) found that reading a text with a vocabulary containing more than 2% of unknown words curtails reading comprehension. Imagine a child who has never seen a crab, or eaten a lobster, trying to understand an external skeleton. What picture will this child conjure of their *armor*? What, if anything, can the child learn about *molting*, or about this unusual adaptation to rocky coastal living? What is lost when this experience repeats itself over and over in the real texts children encounter? *The chief culprit behind the reading achievement gap is a language gap.*

"There are considerable differences in the vocabularies children bring to school, and these differences tend to snowball."

The language roots of the achievement gap start early. There are considerable differences in the vocabularies children bring to school, and these differences tend to snowball. Moats (2001) estimates that *linguistically advantaged* children know about 20,000 words on entering first grade, whereas *linguistically disadvantaged* children know about 5,000. Moats labels this gap *word poverty.* Not only do these early differences in vocabulary knowledge tend to linger (Cunningham and Stanovich, 1998; Stanovich, 1986), but also the vocabulary gap widens each year (Hart and Risley, 1995; Snow, Barnes, Chandler, Goodman, and Hemphill, 1991; Stanovich, 1986). This is because the meaning of one word facilitates the learning of a related one: there is a cumulative advantage to vocabulary growth. A child who knows what a crab is can grasp its similarity to a *lobster,* visualize their sturdy shells as *armor,* understand a term like *molting,* and classify these creatures as *crustaceans* more easily. The earlier in school we start to address the language gap, the better.

Children who have not been steadily increasing their vocabularies are simply not prepared for the words they will encounter in fourth grade, or on the NAEP. There are a lot of different words from which authors can choose. Nagy and Anderson (1984) estimated that 88,700 word families are used in books through twelfth grade and that the average twelfth-grade student knows about 45,000 of them. Some students know a lot more word families than average, and some know a lot fewer. This discrepancy will determine much about their future educational and career choices.

While the NAEP sets a high bar, children encounter less common, more exact vocabulary than they typically hear in everyday conversations as soon as they enter the world of print. Kindergarten children listen to the storybook *Rosie's Walk*: "Rosie the hen went for a walk across the yard, around the pond, over the haystack, past the mill . . ." (Hutchins, 1968). Once out of the yard, Rosie visits places with which children may not be familiar. Indeed, one of the joys of

reading is the way books transport us out of everyday life. With every word that a child does not understand, the journey becomes less captivating.

Reading improves overall intellectual growth (Cunningham and Stanovich, 1998), whether it involves using our imaginations or learning about external skeletons, the classification *crustacean,* and environmental adaptation. The vocabulary we encounter in books can even refine emotional intelligence. A third-grade child reads in a Beverly Cleary story that Ramona worried when her parents *bickered* (Cleary, 1985, pp. 180–181). This is not a word a child is likely to encounter outside of a book. A child might lament, "My parents fight," but not "My parents bicker." Yet by increasing children's understanding of nuances in meaning, "book language" gives shape to fine-grained distinctions in human interactions. Do parents *bicker, debate, fight?*

Authors routinely substitute less common words for ordinary ones—*thump* for *tap* or *quarrel* for *fight* (Snow, 1983). A wide swath of vocabulary appears in storybooks, not just in content texts. As Stahl (1999) wonderfully described it, "We live in a sea of words." Authors speak with words that express descriptive and emotional nuances. This language is one reason we read. Our sensitivity grows in response to word wealth, and we grow as people.

Growth in language reflects growth in world knowledge. In a sense, vocabulary is a proxy for knowledge (Hirsch, 2003). *All* children are learning about the world, and the finer distinctions promoted by a wide vocabulary help children express and understand what they learn. Children will not only score better on high-stakes tests with more vocabulary, but, in school and in our literate society, this vocabulary also opens doors to intellectual growth.

The Need for Commentary and Clarification

Wide reading, or having children listen to wide reading, seems the most logical method to promote vocabulary growth. But studies suggest that this reading is not effective unless it is supported by enriched discussions of new vocabulary. For the young child who is not yet able to engage in wide reading, the teacher's role is especially critical. Bus, Van Ijzendoorn, and Pellegrini (1995) found the average effect size of studies that have examined the outcomes of reading to children on vocabulary growth and comprehension to be .67, or about two thirds of a standard deviation—a major effect. The effect size on vocabulary growth was notably larger for children ages 5 and 6 (mean effect size: .86) than for children under 4 1/2 years old (mean effect size: .34). The effect on older children obviously has importance for schooling. To get that vocabulary boost, however, reading had to include verbal clarification of the book words that children did not know.

Discussing the concepts behind new vocabulary as a class improves students' ability to learn words independently.

Children who read more have more chances to learn words, but learning vocabulary from context in books is not easy. Outside of textbooks, words are usually not defined. Moreover, when children read privately, there is no one to supply additional information about words such as *crustaceans* or to ask, "Do you know what a *pond* is?" Researchers estimate that of 100 unknown words encountered in texts, only 5–15% will be learned (Nagy, Herman, and

Anderson, 1985; Swanborn and de Glopper, 1999). Attempts to help children learn from context more strategically have generally not succeeded (Kuhn and Stahl, 1998).

If children know enough of the concepts behind enough of the words in conversations or texts, they consistently attach new knowledge to words—even though that knowledge may be tentative at first. If a child knows words like *external, armor, skeleton, crab,* and *lobster,* the child may know enough to partially grasp a new word like *molting* and a new concept such as *crustacean.* To come equipped with this kind of vocabulary knowledge, to approach new words and new concepts with the ability to grasp them, requires that a wide background in vocabulary has been developed all along the way in school. There are a lot of different words, and building vocabulary takes exposure, help (often in the form of verbal clarification), and time.

A wide vocabulary base is important because there is no way to know that the author of the book a child picks up in free reading will use the term *bicker,* or that the assessment the child takes will have passages about *crabs* and *crustaceans.* The best way to prepare for these experiences is to broaden the child's vocabulary and general world knowledge. The more words children know, the more they will understand, follow, learn from, and enjoy books and texts, as well as succeed on high-stakes assessments.

"The more words children know, the more they will understand . . ."

While all children expand their knowledge and vocabulary in the classroom, some are particularly dependent on school. We know that children who grow up in low-income neighborhoods are likely to have smaller vocabularies than children who grow up in affluent neighborhoods (Duncan, Brooks-Gunn, and Klebanov, 1994; Hart and Risley, 1995; Lonigan and Whitehurst, 1998; McLloyd, 1998; Whitehurst and Lonigan, 2001). Parents with lower socioeconomic status (SES) often have less education than affluent parents and generally expose their children to both a smaller number of words overall and less analytic interchange about the meanings of those words (Heath, 1983; Hart and Risley, 1995; Wells, 1985; White and Watts, 1973).

One in twelve Kindergarten children in the United States comes from a home in which English is not the primary language (August and Hakuta, 1997). Many children learning English as a second language are concentrated in low-SES urban areas. In Los Angeles Unified School District, for example, 74% of children are Hispanic and 83% of school-age children qualify for free or reduced-cost lunch. If a child's exposure to a wide swath of English vocabulary is limited by living in low-SES and/or limited-English communities, language growth in English is likely to lag (Wong Fillmore, 1982, 1985, 1991, 1992; Valdés, 1998). Children who grow up interacting with peers and community members who speak limited English do not hear lots of rich vocabulary, and exposure matters (Hart and Risley, 1995).

Researchers and teachers have increasingly recognized that we must do considerably more in school to address the language gap. That effort needs to start early. Vocabulary plays a powerful role in reading comprehension (Baker,

Simmons, and Kame'enui, 1998; Dickinson and Tabors, 2001; Hoover and Gough, 1990). The vocabulary of children entering first grade predicts not only their word reading ability at the end of first grade (Sénéchal and Cornell, 1993) but also their eleventh-grade reading comprehension (Cunningham and Stanovich, 1998). If your eye is on improving performance on the fourth-grade or the eighth-grade reading assessment, *the key is to develop vocabulary from the beginning*. If your eye is on improving word recognition in first-grade children, vocabulary knowledge is equally essential.

Limitations of Phonics

Phonics instruction is based on the assumption that in sounding out a word, the child will hit upon something that is recognizable in his or her oral vocabulary. Sounding out a word using the rules and letter-sound associations taught in phonics yields the child a shaky-sounding representation—not an exact match—of the word (e.g., *hog* as *huh, huhaaawwwguh*). Getting to a meaningful representation of hog requires some familiarity with the animal. When there is no match, the reader may associate the spoken or written word with another word that shares some of its letters or sounds (Juel and Deffes, 2004). This is particularly likely to happen if there is little context around the word, as can happen in phonics instruction. I have encountered children who, perhaps due to vernacular dialect or because they do not attach meaning to the word, say that a *hog* is a *hawk* or a *log*. After painfully sounding out *hog,* a child explains that its meaning is "like a tree branch." *Thorn* means "like if you rip somebody's paper." *Troop* means "don't tell lies." The best phonics instruction is ultimately worthless if, upon a word's being decoded, it is connected either to no meaning or to a wrong one. As with every other aspect of reading, oral vocabulary underlies the success of the venture.

Phonics instruction must be supplemented by analyzing word meanings to be effective.

Currently, teachers of young children are observed to spend little time carefully analyzing word meanings in texts with their classes (Biemiller, 2001 a; 2001 b; Juel, Biancarosa, Coker, and Deffes, 2003). It may be difficult for a Kindergarten teacher to see the advantage in analyzing the terms *quarrel* or *quibble* from Leo Lionni's *It's Mine* (1986). *Fight,* a teacher may reflexively think, will do in conversation, and children this age are unlikely to be reading these words on their own. But a rich base of vocabulary paves the way for learning new words: knowing a term like *quarrel* facilitates the later understanding of *bicker.* In a sense, what teachers of young children need to do is prepare children for what lies down the road. This is exactly what is needed to offset the early gaps in vocabulary that have been described previously and to keep new ones at bay.

Comprehending and learning from text requires excellent decoding, but it also requires a hearty vocabulary. If a child identifies creatures as *crabs* and *lobsters,* then that child can more easily recognize their similar *armor* and understand an interesting adaptation to the vicissitudes of coastal living.

From a universe of about 80,000 different words in school texts, children can encounter an unpredictable subset in any given text (Nagy and Anderson, 1984). It's hard to predict which words a child might meet in a book or on a test. Assessment day in fourth grade might be the one and only day in years that the child sees *crustacean.* However, most of these 80,000 words are not unusual.

Words anchoring the less common end of the continuum include *beneficial, warn, fiction, pebble, remark, disappointment, astronomer, suggestion, iceberg,* and *horrible* (Adams, 1990; Stahl, 1999).

When children encounter unfamiliar words in texts, they often have few opportunities to practice the words or even encounter them again. A child may hear about Rosie the *hen* when her Kindergarten teacher reads *Rosie's Walk,* but that child is not likely to encounter *hen* in a text again very soon—and even less likely to meet the word *haystack* (towards the rare end of the 80,000 less-frequent words category). One encounter with Rosie the hen does not mean that a child knows all about hens. Maybe all that the child gleaned from the text came from the illustration, and the child remembers only the peculiar shape of hens. It is easy to see why storybook reading was shown to affect vocabulary knowledge only when combined with some clarification about the meanings of words (Biemiller, 1999; Bus et al., 1995).

One of the saddest findings in my own longitudinal work has been that language development in children from lower SES and limited-English backgrounds tapers over time. The children come into first grade with lower language skills; they work hard, learn to decode, and begin to read for enjoyment starting in about second grade; they see considerable increases in their listening comprehension and vocabulary in the second and third grades; but toward the end of fourth grade, their language development slows (Juel, 1988; Juel, 1994). Their reading comprehension then begins to suffer due to limited world knowledge and vocabulary to express that knowledge. To really overcome the reading achievement gap, to ensure that children can learn from their readings in school, to support reading enjoyment and reading comprehension in all children, vocabulary—and the concepts and knowledge that vocabulary represents—must be developed from the beginning of schooling. Teachers need to take every opportunity to expand language: through phonics instruction, through reading to children, and through clarifying the meanings of words that children read. Effective vocabulary instruction is the instruction that will best serve our children as they become interested, competent readers.

Author's note: A more extended discussion on this topic can be found in Juel, C. "The Impact of Early School Experiences on Initial Reading," in D. K. Dickinson and S. B. Neuman, eds., *Handbook of Early Literacy Research,* vol. 2. Guilford, 2005.

REFERENCES

Adams, M. J. *Beginning to Read: Thinking and Learning About Print.* MIT Press, 1990.

August, D., and K. Hakuta, eds. *Improving Schooling for Language-Minority Children: A Research Agenda.* National Academy Press, 1997.

Baker, S. K., D.C. Simmons, and E. J. Kame'enui. "Vocabulary Acquisition: Research Bases," in D. C. Simmons and E. J. Kame'enui, eds., *What Reading Research Tells Us About Children with Diverse Learning Needs,* pp. 183–218. Erlbaum, 1998.

Biemiller, A. *Language and Reading Success. Brookline Books, 1999.*

———. *Building Vocabulary: A Key to Reading Success.* Paper presented at the Norma Broussard Memorial Reading Conference (January 2001).

———. "Teaching Vocabulary." *American Educator,* vol. 26.4 (2001), pp. 24–28, 47.

Bus, A. G., M. H. Van Ijzendoorn, and A. D. Pellegrini. "Joint Book Reading Makes for Success in Learning to Read: A Meta-Analysis on Intergenerational Transmission of Literacy." *Review of Educational Research,* vol. 65 (1995), pp. 1–21.

Carroll, J. B., P. Davies, and B. Richman. *Word Frequency Book.* American Heritage, 1971.

Carver, R. P., and R. E. Leibert. "The Effect of Reading Library Books at Different Levels of Difficulty upon Gain in Reading Ability." *Reading Research Quarterly,* vol. 30.1 (1995), pp. 26–48.

Cleary, B. *Ramona Forever.* Dell, 1985.

Cunningham, A. E., and K. E. Stanovich. "What Reading Does for the Mind." *American Educator,* vol. 22 (1998), pp. 8–15.

Dickinson, D. K., and P. Tabors, eds. *Building Literacy with Language: Young Children Learning at Home and School.* Brooke, 2001.

Duncan, G., J. Brooks-Gunn, and P. Klebanov. "Economic Deprivation and Early Childhood Development." Child Development, vol. 65 (1994), pp. 296–318.

Hart, B., and R. T. Risley. *Meaningful Differences in the Everyday Experiences of Young American Children.* Brooke, 1995.

Heath, S. B. *Ways with Words.* Cambridge University Press, 1983.

Hirsch, E. D. "Reading Comprehension—Of Words and the World." *American Educator* (Spring 2003), pp. 10–29.

Hoover, W., and P. B. Gough. "The Simple View of Reading." *Reading and Writing: An Interdisciplinary Journal,* vol. 2 (1990), pp. 127–160.

Hutchins, P. *Rosie's Walk.* Macmillan, 1968.

Juel, C. "Learning to Read and Write: A Longitudinal Study of Fifty-Four Children from First Through Fourth Grade." *Journal of Educational Psychology,* vol. 80.4 (1988), pp. 437–447.

———. *Learning to Read and Write in One Elementary School.* Springer-Verlag, 1994.

Juel, C., G. Biancarosa, D. Coker, and R. Deffes. "Walking with Rosie: A Cautionary Tale of Literacy Instruction." *Educational Leadership,* vol. 60.7 (2003), pp. 12–18.

Kuhn, M. R., and S. A. Stahl. "Teaching Children to Learn Word Meanings from Context: A Synthesis and Some Questions." *Journal of Literacy Research,* vol. 30.1 (1998), pp. 19–38.

Lionni, L. *It's Mine.* New York: Dragonfly, 1986.

Lonigan, C. J., and G. J. Whitehurst. "Examination of the Relative Efficacy of Parent and Teacher Involvement in a Shared-Reading Intervention for Preschool Children from Low-Income Backgrounds." *Early Childhood Research Quarterly,* vol. 13 (1998), pp. 263–290.

McLloyd, V. C. "Socioeconomic Disadvantage and Child Development." *American Psychologist,* vol. 53 (1998), pp. 185–204.

Moats, L. "Overcoming the Language Gap." *American Educator* (Summer 2001), pp. 5–9.

Nagy, W. E., and R. C. Anderson. "How Many Words Are There in Printed School English?" *Reading Research Quarterly,* vol. 19 (1984), pp. 304–330.

Nagy, W. E., P. A. Herman, and R. C. Anderson. "Learning Words from Context." *Reading Research Quarterly,* vol. 20 (1985), pp. 233–253.

Sénéchal, M., and E. H. Cornell. "Vocabulary Acquisition Through Shared Reading Experiences." *Reading Research Quarterly,* vol. 28 (1993), pp. 360–374.

Snow, C. E. "Literacy and Language: Relationships During the Preschool Years. *Harvard Educational Review,* vol. 53 (1983), pp. 165–189.

Snow, C. E., W. Barnes, J. Chandler, I. Goodman, and L. Hemphill. *Unfulfilled Expectations: Home and School Influences on Literacy.* Harvard University Press, 1991.

Stahl, S. A. *Vocabulary Development.* Brookline Books, 1999.

Stanovich, K. E. "Matthew Effects in Reading: Some Consequences of Individual Differences in the Acquisition of Literacy." *Reading Research Quarterly,* vol. 21 (1986), pp. 360–406.

Swanborn, M. S. L., and K. de Glopper. "Incidental Word Learning While Reading: A Meta-Analysis." *Review of Educational Research,* vol. 69 (1999), pp. 261–285.

Valdés, G. "The World Outside and Inside Schools: Language and Immigrant Children." *Educational Researcher,* vol. 27 (1998), pp. 4–18.

Wells, G. G. *Language Development in the Preschool Years.* Cambridge University Press, 1985.

White, B. L., and J. C. Watts. *Experience and Environment.* Prentice-Hall, 1973.

Whitehurst, G. J., and C. J. Lonigan. "Emergent Literacy: Development from Prereaders to Readers," in S. B. Neuman and D. K. Dickinson, eds., *Handbook of Early Literacy Research* (pp. 11–29). Guilford Press, 2001.

Wong Fillmore, L. "Language Minority Students and School Participation: What Kind of English Is Needed?" *Journal of Education,* vol. 164 (1982), pp. 143–156.

———. "When Does Teacher Talk Work as Input?," in S. Gass and C. Madden, eds., *Input in Second Language Acquisition* (pp. 17–50). Newbury, 1985.

———. "Second Language Learning in Children: A Model of Language Learning in Social Context," in E. Bialystok, ed., *Language Processing in Bilingual Children* (pp. 49–69). Cambridge University Press, 1991.

———. "Learning a Language from Learners," in C. Kramsch and S. McConnell-Ginet, eds., *Text and Context: Cross-Disciplinary Perspectives on Language Study* (pp. 46–66). Heath, 1992.

scottforesman.com
800-552-2259