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A Wealth of Words

The key to increasing upward mobility is expanding vocabulary.

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A number of notable recent books, including Joseph Stiglitz's *The Price of Inequality* and Timothy Noah's *The Great Divergence*, lay out in disheartening detail the growing inequality of income and opportunity in the United States, along with the decline of the middle class. The aristocracy of family so deplored by Jefferson seems upon us; the counter-aristocracy of merit that long defined America as the land of opportunity has receded.





ILLUSTRATIONS BY RICHARD LILLASH

These writers emphasize global, technological, and sociopolitical trends in their analyses. But we should factor in another cause of receding economic equality: the decline of educational opportunity. There's a well-established correlation between a college degree and economic benefit. And for guidance on what helps students finish college and earn more income, we should consider the SAT, whose power to predict graduation rates is well documented. The way to score well on the SAT—at least on the verbal SAT—is to have a large vocabulary. As the eminent psychologist John Carroll once observed, the verbal SAT is essentially a vocabulary test.

So there's a positive correlation between a student's vocabulary size in grade 12, the likelihood that she will graduate from college, and her future level of income. The reason is clear: vocabulary size is a convenient proxy for a whole range of educational attainments and abilities—not just skill in reading, writing, listening, and speaking but

also general knowledge of science, history, and the arts. If we want to reduce economic inequality in America, a good place to start is the language-arts classroom.

Early in the twentieth century, a well-meant but inadequate conception of education became dominant in the United States. It included optimism about children's natural development, a belief in the unimportance of factual knowledge and book learning, and a corresponding belief in the importance of training the mind through hands-on practical experience. In the 1920s and 1930s, these ideas began spreading to teacher-training institutions. It took two or three decades for the new teachers and administrators to take over from the old and for the new ideas to revolutionize schoolbooks and classroom practices. The first students to undergo this new schooling therefore began kindergarten in the 1950s and arrived in 12th grade in the 1960s.

Their test scores showed the impact of the new ideas. From 1945 to 1967, 12th-graders' verbal scores on the SAT and other tests had risen. But then those scores plummeted. Cornell economist John Bishop wrote in the 1980s of "the historically unprecedented nature of the test score decline that began around 1967. Prior to that year test scores had been rising steadily for 50 years." The scores reached their nadir around 1980 and have remained low ever since.

Some scholars thought that the precipitous fall of verbal SAT scores simply reflected the admirable increase in the percentage of low-income students taking the SAT. But Bishop observed that the same downhill pattern had occurred in verbal scores on the Iowa Test of Educational Development—a test given to all Iowa high school students, who were 98 percent white and mostly middle-class in attitude. He argued that the declining effectiveness of American schools was a leading indicator for the shrinking income of the American middle class. The evidence today suggests that he was right. The decline in the educational productivity of our schools tracks our decline in income equality. For 30 years after 1945, Stiglitz observes, economic equality advanced in the United States; after about 1975, it declined.

Later, another Cornell scholar, the sociologist Donald Hayes, showed that the decline of the verbal SAT scores was indeed correlated with a dumbing-down of American schoolbooks. Following the lead of the great literacy scholar Jeanne Chall, Hayes found that publishers, under the influence of progressive educational theories, had begun to use simplified language and smaller vocabularies. Hayes demonstrated that the dilution of knowledge and vocabulary, rather than poverty, explained most of the test-score drop.

Vocabulary doesn't just help children do well on verbal exams. Studies have solidly established the correlation between vocabulary and real-world ability. Many of these studies examine the Armed Forces Qualification Test (AFQT), which the military devised in 1950 as an entrance requirement and a job-allocating device. The exam consists of two verbal sections (on vocabulary size and paragraph comprehension) and two math sections. The military has determined that the test predicts real-world job performance most accurately when you *double* the verbal score and add it to the math score. Once you perform that adjustment, according to a 1999 study by Christopher Winship and Sanders Korenman, a gain of one standard deviation on the AFQT raises one's annual income by nearly \$10,000 (in 2012 dollars). Other studies show that much of the disparity in the black-white wage gap disappears when you take AFQT scores—again, weighted toward the verbal side—into account.

Such correlations between vocabulary size and life chances are as firm as any correlations in educational research. Of course, vocabulary isn't perfectly correlated with knowledge. People with similar vocabulary sizes may vary significantly in their talent and in the depth of their understanding. Nonetheless, there's no better index to accumulated knowledge and general competence than the size of a person's vocabulary. Simply put: knowing more words makes you smarter. And between 1962 and the present, a big segment of the American population began knowing fewer words, getting less smart, and becoming demonstrably less able to earn a high income.

Why should vocabulary size be related to achieved intelligence and real-world competence? Though the intricate details of cognitive abilities are under constant study and refinement, it's possible to give a rough answer. The space where we solve our problems is called "working memory." For everyone, even geniuses, it's a small space that can hold only a few items in suspension for only a few seconds. If one doesn't make the right connections within that space, one has to start over again. Hence, one method for coping and problem solving is to reduce the number of items that one has to make sense of at any moment. The psychologist George A. Miller called that process "chunking." Telephone numbers and Social Security numbers are good examples. The number (212) 374-5278, written in three chunks, is a lot easier to cope with than 2123745278.

Words are fantastically effective chunking devices. Suppose you put a single item into your working memory—say, "Pasteur." So long as you hold in your long-term memory a lot of associations with that name, you don't need to dredge them up and try to cram

them into your working memory. The name serves as a brief proxy for whatever aspects will turn out to be needed to cope with your problem. The more readily available such proxies are for you, the better you will be at dealing with various problems. Extend this example to whole spheres of knowledge and experience, and you'll realize that a large vocabulary is a powerful coping device that enhances one's general cognitive ability.

If vocabulary is related to achieved intelligence and to economic success, our schools need to figure out how to encourage vocabulary growth. They should understand, for starters, that word-learning occurs slowly and through a largely unconscious process. Consider the word "excrescence." Few know the word; fewer still encounter it in their everyday lives. Maybe you do know it, but imagine that you don't.

Now suppose I gave it to you in a sentence: "To calculate fuel efficiency, the aerospace engineers needed an accurate estimation of *excrescence* drag caused by the shape of the plane's cabin." That single exposure to the word is probably insufficient for you to grasp its meaning, though if you know something about aerospace engineering, you'll be likelier to make a good approximation. Here's an encounter in another context: "*Excrescences* on the valves of the heart have been known to cause a stroke." Perhaps now you have a vague understanding of the word. A third meaningful encounter will allow you to check your understanding or refine your sense of the meaning: "The wart, a small *excrescence* on his skin, had made Jeremy self-conscious for years." By now, you probably have a pretty solid understanding of the word, and one more encounter in a familiar context should verify your understanding: "At the far end of the meadow was what, at first glance, I thought a huge domed building, and then saw was an *excrescence* from the cliff itself."

You've probably figured out that the word "excrescence" means "an outgrowth." That's an accelerated, artificial example of how word-learning occurs. The sense of a word that a listener or reader gains from multiple exposures to it isn't a fixed and definite meaning but rather a system of meaning *possibilities* that get narrowed down through context on each occasion. As Miller showed, knowledge of a word is a memory residue of several meaningful encounters with the word in diverse contexts. We retain bits of those past contexts in memory as part of the word's meaning-potential. Almost all the word meanings that we know are acquired indirectly by intuitively guessing new meanings as we get the overall gist of what we're hearing or reading.

As the example also shows, it takes knowledge of surrounding words to guess a new word's connotations. "Domed building" and "cliff" helped you guess the meaning of

“excrecence” better than “drag” and “valves” did. And the context for an unfamiliar word isn’t just the other words surrounding it in a text but also the situation referred to by those words. Familiarity with the relevant subject matter ensures that a student’s unconscious meaning-guesses are likely to be right.

So the fastest way to gain a large vocabulary through schooling is to follow a systematic curriculum that presents new words in familiar contexts, thereby enabling the student to make correct meaning-guesses unconsciously. Spending large amounts of school time on individual word study is an inefficient and insufficient route to a bigger vocabulary. There are just too many words to be learned by 12th grade—between 25,000 and 60,000. A large vocabulary results not from memorizing word lists but from acquiring knowledge about the social and natural worlds.

The dependence of language comprehension on specific domains of knowledge comes into clear focus when we turn our attention from all-purpose words like conjunctions, adverbs, and verbs, and look at nouns. We used to be taught that “a noun is the name of a person, place, or thing.” That wasn’t a full definition, since it left out abstract ideas, but it was useful in emphasizing that a noun *names* something in the world—there’s no escaping the referential character of language. You can’t know what the noun means without knowing the thing that it names; conversely, you rarely know the thing without also knowing its name.



The trick in speeding up word-learning is to make sure that the subject matter that the words refer to has already been made familiar to the student. The speed with which students learn new words increases dramatically when schools create familiar subject-matter contexts within a coherent sequential curriculum, as the cognitive scientist Thomas Landauer has demonstrated. The fastest way to learn words is to learn about things—and to do it systematically.

Plenty of evidence backs up that proposition. The reading researcher John Guthrie has shown how well a system called “concept-oriented reading instruction” works. Similarly, in classrooms all over the world, including in the United States, children and adults are successfully being taught foreign languages through a method called “content-based instruction.” The content varies with the age of the student; kindergartners may learn another language by studying farms, while college students do it by studying social psychology. The method has proved to be one of the most effective ways to learn a second language.

The advantages of content-based instruction are enormous. One is that the topic itself is interesting, so the student has a strong motivation to understand what is being said or written. But an even more important advantage is that immersion in a topic provides the student with a referential and verbal context that is gradually made familiar, which encourages correct guesses of word meanings at a much more rapid pace than would be possible in an unfamiliar context. Psychologists refer to certain skills as being “domain-specific,” so perhaps a better name for content-based language acquisition would be “domain immersion.” The idea is to immerse students in a domain long enough to make them familiar with the context—and thus able to learn words faster.

For the purposes of teaching vocabulary, a “domain” could be defined as a sphere of knowledge in which concepts and words are repeated over the course of two or three weeks. Such repetition happens automatically in a classroom unit on, say, plants and photosynthesis. Students then learn not just the theme-based words of a domain—such as “seeds” in the kindergartners’ lessons on farms, or “empathy” in the university social-psychology class—but also the meanings of more general words, such as “however,” “conversely,” “credible,” and “annual.”

The domain-based approach to literacy—using a coherent, content-based curriculum to teach language—is the educational policy of the nations that achieve the best verbal results for both advantaged and disadvantaged students *and* narrow the gaps between them. The Organisation for Economic Co-operation and Development has devoted

massive resources to international comparisons of educational effectiveness, with particular attention to gap-narrowing between demographic groups. Its most recent Programme for International Student Assessment (PISA) report identifies the nations that best combine excellence with equity as Korea, Finland, Japan, and Canada. In these places, the report says, “everyone knows what is required to get a given qualification, in terms both of the content studied and the level of performance that has to be demonstrated to earn it.” In those countries’ classrooms, opportunities for a student to make correct meaning-guesses and build vocabulary occur frequently because the schools follow definite content standards that build knowledge grade by grade, thus offering constant opportunities to learn new words in contexts that have been made familiar.

Four decades ago, France led the world in both academic achievement and equality of educational opportunity. Today, it’s absent from the PISA list of the highest-scoring, highest-equity nations. According to my colleagues in France, the decline began in the 1980s, when French elementary schools, which once followed a very specific sequential curriculum, began to diversify according to the American mode, with each elementary school developing its own plan.

The old French system didn’t just have coherent, cumulative elementary schools; it had coherent, cumulative preschools as well. These schools have not degenerated as the elementary schools have; indeed, the French preschool system is still the best in the world. Nearly every child in France attends a free public preschool—an *école maternelle*—and some attend for three years, starting at age two. The preschools are academically oriented from the start. Each grade has a set curriculum and definite academic goals, and the teachers, selected from a pool of highly qualified applicants, have been carefully trained.

In the 1970s and 1980s, the French conducted an experiment with 2,000 students to determine whether sending children to preschool at age two was worth the public expense. The results were remarkable. After seven years of elementary school, disadvantaged students who had started preschool at age two had fully caught up with their more advantaged peers, while those who had started at three didn’t do quite as well, and those who had started at four trailed still further behind. A good preschool, it turned out, had highly egalitarian effects. A very early start, followed by systematic elementary schooling, can erase much of the achievement gap, though the payoff isn’t fully apparent until the later grades—a delayed effect that is to be expected, given the slowness and cumulateness of word-learning.

To grasp the significance of this remarkable result, it's important to grasp the extreme difficulty of narrowing the verbal gap between advantaged and disadvantaged students. The problem has been called the Matthew Effect, an allusion to Matthew 25:29: "For unto every one that hath shall be given, and he shall have abundance: but from him that hath not shall be taken away even that which he hath." Advantaged students who arrive in the classroom with background knowledge and vocabulary will understand what a textbook or teacher is saying and will therefore learn more; disadvantaged students who lack such prior knowledge will fail to understand and thus fall even further behind, relative to their fellow students. This explains why schooling often fails to narrow the gap and may even widen it.

The French data show that the Matthew Effect can be almost fully overcome—with an early start and curricular coherence. But how? Why didn't the Matthew Effect sink those very early preschool children in France who started out as cognitive have-nots? Part of the explanation is simply quantitative: disadvantaged children at age two are at less of an *absolute* disadvantage. If the more knowledgeable kids start school knowing 200 words while the less knowledgeable know just 100, the latter may be far behind percentage-wise, but still, they're just 100 words behind in absolute terms. The French preschools help fill in that gap by teaching the less knowledgeable kids enough words and things to enable them to understand the language of the classroom. Yes, they have to guess more meanings than their more advantaged classmates do—but they can do so correctly because of the careful way in which the curriculum puts all the children in the catch-up zone of content familiarity.

The picture is complicated by the fact that the advantaged children continue to hear and learn much more from their parents and peers outside school. (That's why it's so much easier for less knowledgeable children to catch up in math than in language: math is chiefly a school subject, while language is learned constantly outside school, where differences in background remain significant.) So again: How did the disadvantaged French children catch up with their advantaged peers?

Here's how. Systematic schooling using a coherent and cumulative curriculum covers a wide range of domains as the years go by. The cognitive scientist Keith Stanovich has shown that the vocabulary of the classroom and of books is far richer than that of everyday conversation even among highly educated groups. Hence, as schooling covers more and more subjects, it imparts an ever-broader vocabulary. Under those conditions, disadvantaged students do have to keep successfully guessing more words than their

advantaged peers do. But eventually, the knowledge and vocabulary gap is virtually closed.

To make the necessary school changes in the United States, an intellectual revolution needs to occur to undo the vast anti-intellectual revolution that took place in the 1930s. We can't afford to victimize ourselves further by continued loyalty to outworn and mistaken ideas. Of these, the idea that most requires overturning is how-to-ism—the notion that schooling should concern itself not with mere factual knowledge, which is constantly changing, but rather with giving students the intellectual tools to assimilate new knowledge. These tools typically include the ability to look things up, to think critically, and to accommodate oneself flexibly to the world of the unknowable future.

How-to-ism has failed because of its fundamental misconception of skills, which considers them analogous to automated processes, such as making a free throw in basketball. In English class, young children are now practicing soul-deadening how-to exercises like “finding the main idea” in a passage and “questioning the author.” These exercises usurp students' mental capacity for understanding what is written by forcing them to think self-consciously about the reading process itself. The exercises also waste time that ought to be spent gaining knowledge and vocabulary. The increasingly desperate pursuit of this empty, formalistic misconception of reading explains why our schools' intense focus on reading skills has produced students who, by grade 12, can't read well enough to flourish at college or take a good job.

Another mistaken idea that must be scrapped is that curricula don't need to build knowledge coherently and cumulatively. Consider the topics or “themes” that one best-selling reading program covers in the first grade. Theme Five, called “Home Sweet Home,” includes lessons called “Moving Day,” “Me on the Map,” and “The Kite.” The lessons of Theme Six, “Animal Adventures,” are “The Sleeping Pig,” “EEK! There's a Mouse in the House,” and “Red-Eyed Tree Frog.” Then come Theme Seven, “We Can Work It Out” (“That Toad Is Mine!,” “Lost!,” “If You Give a Pig a Pancake”), and Theme Eight, “Our Earth” (“The Forest,” “Butterfly,” “Johnny Appleseed”). Theme Nine, “Special Friends,” and Theme Ten, “We Can Do It!,” contain equally helter-skelter stories. As the names indicate, the texts have little substantive connection with one another and therefore offer few chances to speed word-learning through subject-matter familiarity.

Well, you might say, that's just first grade; surely more coherence will come later. Actually, no. Theme One of fourth grade is “Journeys” (“Akiak,” “Grandfather's

Journey," "Finding the *Titanic*," "By the Shores of Silver Lake"), and Theme Two is "American Stories" ("Tomas and the Library Lady," "Tanya's Reunion," "Boss of the Plains," "A Very Important Day"). In sixth grade, Theme One is "Courage" ("Hatchet," "Passage to Freedom," "Climb or Die," "The True Confessions of Charlotte Doyle"), followed by Theme Two, "What Really Happened?" ("Amelia Earhart, First Lady of Flight," "The Girl Who Married the Moon," "Dinosaur Ghosts").

Since large parts of the school day—usually two morning hours—are spent teaching literacy, the opportunity costs of such incoherence and fragmentation, especially for disadvantaged students, are easy to imagine. The misguided approach fails to do what domain immersion does: repeat words and concepts steadily, teaching students not only the subject under study but also an abundance of words.

Because vocabulary is a plant of slow growth, no quick fix to American education is possible. That fact accounts for many of the disappointments of current education-reform movements. For example, the founders of the KIPP charter schools, which have greatly helped disadvantaged children, recently expressed concern that only 30 percent of their graduates had managed to stay in college and gain a degree. But note that KIPP schools typically start in fifth or sixth grade, and while KIPP's annual reports show that their students achieve high scores in math, they score significantly lower in reading. I interpret those facts to signify that middle school is too late to rectify disadvantaged students' deficits of vocabulary and knowledge. Word-learning is just too slow a process to close those initial gaps in time for college. The work of systematic knowledge- and word-building has to begin earlier.

I would make three practical recommendations to improve American students' vocabularies, and hence their economic potential: better preschools, run along the French lines; classroom instruction based on domain immersion; and a specific, cumulative curriculum sequence across the grades, starting in preschool. Of these, the last is the most important but also the toughest to achieve politically. But the new Common Core State Standards for language arts, now adopted by more than 40 states, may offer a ray of hope (see "[The Curriculum Reformation](#)," Summer 2012). One statement in the new standards reads: "By reading texts in history/social studies, science, and other disciplines, students build a foundation of knowledge in these fields that will also give them the background to be better readers in all content areas. Students can only gain this foundation when the curriculum is intentionally and coherently structured to develop rich content knowledge within and across grades." A second encouraging passage: "The Common Core Standards do not—indeed, cannot—

enumerate all or even most of the content that students should learn. The Standards must therefore be complemented by a well-developed, content-rich curriculum.”

These two statements are big steps forward from the failed how-to approaches of the recent past. Their sentiments should be imported into all state and district standards and then followed up concretely. My hope is that some influential district superintendent will require a specific grade-by-grade knowledge sequence. The striking success of one major urban district could transform practice throughout the nation.

The best schools and teachers have already taken some of the steps that I’ve advocated. After James S. Coleman and his colleagues completed *Equality of Educational Opportunity* (1966), he became distressed that the only lesson people took from his great work was that American schools of the 1960s made far less difference to educational outcomes than family and economic status did. There was another finding at least as important: exceptionally good schools, though better for all students, were especially valuable for disadvantaged ones. Inferior schools, by contrast, harmed disadvantaged students much more than they harmed advantaged ones.

Distressed by the oversimplification of his work, Coleman proceeded to do important research on the success of Catholic schools in raising all students, rich or poor, to high levels of achievement. He found that a key factor in their success was their strong focus on subject-matter knowledge. Many other factors were at work: discipline, focus, expectations, all the many complexities that help determine school outcomes. But at the heart of the matter were the lessons themselves, which, in these Catholic schools, followed a cumulative sequence. The schools employed domain immersion *avant la lettre*.

It isn’t overstating the case to say that the most secure way to predict whether an educational policy is likely to help restore the middle class is to focus on the question: Is this policy likely to expand the vocabularies of 12th-graders? The physicist Max Planck once said that professors never change their minds. But teachers and principals can, when shown a better way. Educators and policymakers should inform themselves about the critical importance of factual knowledge and about the need for a specific and coherent yearly curriculum to impart that knowledge and language effectively. That won’t just improve students’ vocabularies; it will help restore the Jeffersonian ideal of equality of opportunity.

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