

Why Complex Text Matters

The American College Testing Service, in its influential study “Reading Between the Lines” (ACT 2006), determined a benchmark score on their reading test; 51% of students scored above this benchmark. These students were more likely to:

- Enroll in college.
- Earn a grade of B or higher in first-year U.S. history and psychology classes.
- Earn a GPA of 3.0 or higher.
- Return for a second year at the same institution.

It was also found that 47% of students who met the reading test benchmark met the science test benchmark as well, whereas *only* 5% of students who did not meet the reading benchmark met the science test benchmark. This is a particularly interesting finding in light of recent efforts to boost K-12 science learning. The 51% figure of test takers meeting the benchmark was the lowest in over a decade.

Student responses were analyzed with the goal of determining what patterns might distinguish students scoring above the benchmark from those below. The major findings follow:

1. Literal vs. inferential question type failed to differentiate students scoring above the benchmark from those scoring below (p. 13).
2. Questions focusing on textual elements—main idea/author’s purpose, supporting details, relationships, meaning of words, and generalizations and conclusions—also failed to differentiate students scoring above from those scoring below (p. 14).
3. The clearest difference of performance between the two groups was *degree of text complexity*, in the passages that acted as “sorters” within the ACT. This finding held true for both males and females, all racial groups and was steady regardless of family income levels (p. 16).

This is a stunning finding. The textual elements described above and inferential questions in general constitute many of the essential elements of what we usually think of as “critical thinking.” Developing these skills in students has been a major focus of educational efforts in all disciplines for decades. Yet the ACT study shows that, at least for this group of nearly a half million high school students, critical thinking does not distinguish those who are college and career ready from those who are not; facility with reading complex text does.

Text complexity on ACT's Reading tests (the ACT, PLAN, and EXPLORE, covering grades 12, 10 and 8 respectively) was divided into three levels of complexity: *uncomplicated*, *more challenging*, and *complex* (p. 14). In looking at scores based on this complexity gradient the following was found:

1. Students scoring below the benchmark (49% of the 568,000 taking the test) scored *no better than chance* on multiple-choice items associated with complex text, the most challenging of the three levels.
2. Only students who obtained nearly perfect scores (35 out of 36) did as well on complex text as they did on the less challenging text, indicating that a significant number of students who met the benchmark still scored relatively poorly on complex text.

Four hundred and sixty eight thousand students took the 2006 ACT exam. All were applying or considering applying to some form of post secondary education and therefore were likely to engage seriously with this test. Despite this, 49% , nearly a quarter of a million students, performed no better on the more complex reading passages than if these passages were written in Sanskrit.

How did we arrive at a situation where so many of our students fail to understand complex text? We will address this question, as well as the consequences this problem has generated, both those already present and those likely to emerge or become more widespread over time. We begin with the causes.

1. SCHOOL BOOKS AND READING DEMANDS K–12 HAVE BECOME EASIER.

- Chall et al. (1977) found a 13-year decrease from 1963–1975 in the difficulty of 11th-grade textbooks *in all subjects*; this corresponded with concurrent declines in SAT scores. She found a similar pattern for 6th-grade texts but not as clear-cut as for older students. Similarly, declines in first-grade basal readers corresponded with declining SAT scores *10 years later*.
- Hayes, Wolfer, and Wolfe (1996) found more: between 1963–1991, average length of sentences in reading textbooks K–8 (basals) was shorter than in books published between 1946–62; in 7th and 8th grade readers (usually anthologies, very widely used), the mean length of sentences decreased from 20 to 14 words. Vocabulary also declined: the vocabulary level of 8th-grade basal readers after 1963 was equivalent to 5th-grade readers before 1963; 12th-grade literary anthologies after 1963 were equivalent to 7th-grade readers before 1963.
- Hayes also found that though the vocabulary level of words in basal readers for grades 1–7 increased each year, high school literature books did not increase in

vocabulary difficulty for each year and did not differ greatly from grades 7–8 literature books.

- Hayes also found that though science books were more difficult than literature books, only books in AP classes had vocabulary levels comparable to even newspapers of the time.
- The span of years Hayes' work covers corresponded with SAT declines in the same period. Hayes addresses the question of whether declining SAT scores reflected demographic changes in students taking the test. He points out that the years for the decline do not match up with the years for the demographic shift; more pointedly he notes that the number of students scoring in the highest ranges (600-800) decreased both relatively and absolutely.
- Data since 1962 (Williamson, 2004) show a 305L (Lexile) gap between end of high school and college texts, equivalent to 1.5 standard deviations, or *more than the lexile difference between the 4th grade NAEP and the 8th grade NAEP*.
- Although data after 1992 are not as thorough, it should be noted that the SAT was re-centered in the mid-90s, thus essentially adding about 80 points to the verbal scores (Adams, in press).

These data do not include analysis of elements of text cohesion, which might give a different picture (McNamara, in press). That being said, while no measure of text difficulty is perfect, what is relevant in these numbers is the steady decline over time, across grades, in sophistication and difficulty of text, and the resulting correspondence with dropping SAT scores.

So the texts students read, or certainly many of the texts students read K–12, became easier after 1962. What about texts students were asked to read in college over that period and into our current period?

2. COLLEGE BOOKS AND COLLEGE READING HAVE *NOT* GOTTEN EASIER.

- Lexile scores of college textbooks have not decreased in any block of time since 1962 and in fact have increased (Stenner, in press).
- Hayes (1996) found that vocabulary difficulty of newspapers had remained stable over the period of his study.
- Hayes (1992) found that word difficulty of every scientific journal and magazine he examined between 1930–1990 had *increased*.

- Related to the above, a College Board research report (2005) shows that college professors assign more reading from periodicals than do high school teachers.

3. CURRICULUM AND PEDAGOGY MAY HAVE EXACERBATED THE PROBLEM OF DECLINING K–12 TEXT COMPLEXITY RELATIVE TO COLLEGE DEMANDS.

- Students in high school are not only reading texts significantly less demanding than students in college, but instruction with any texts they do read is heavily scaffolded compared to college, where students are routinely expected to read more independently (National Governors Association & Council of Chief State School Officers, 2009).
- Students in college are held more accountable for what they read than students in high school. College instructors assign readings, not necessarily explicated in class, for which students might be held accountable through exams, papers, presentations, or class discussions. Students in high school are rarely held accountable for what they have read independently (Heller & Greenleaf, 2007). The jarring exception is when college-bound students sit for the college entrance exams.

Note: We are not recommending here that teachers stop supporting students in their reading, only that this support taper off and that on regular occasions students be held accountable and assessed on texts they have not seen before and for which they have had no direct preparation from teachers prior to reading. As pointed out above, for most students, the only time in their K-12 experience this takes place is on standardized tests.

- Students have more difficulty reading expository texts than narrative (Bowen, 1999; Duke, 1998; Heller & Greenleaf, 2007; Shanahan & Shanahan, 2008; Snow, 2002), yet this material currently constitutes only 7% to 15% of instructional text in elementary and middle school (Hoffman et al., 1994; Moss & Newton, 2002; Yopp & Yopp, 2006). In college, most, and for many students *nearly all*, reading is expository (Achieve, 2007).
- The above data take on greater relevance with recent findings from McNamara and Graesser (personal communication – Active Ingredients work) that narrativity is “the most prominent component of reading ease.” In other words, the greater the portion of a student’s total reading is narrative, the greater the ease. Given the time constraints inevitably encountered in school, the more narrative text read, the less opportunity there is of encountering text that is complex.
- Expository text from social studies and science presents students with a different mix of rhetorical and semantic challenges relative to narrative (McNamara, Graesser & Louwerse, 2004). If students only engage in even successful reading

of narrative, they will be denied the opportunity to develop the abilities to overcome the challenges presented by expository texts. These genre challenges however, are related to each other (McNamara, in press), thus each genre's set of challenges will overlap to some degree, and failure to learn from one genre will likely weaken the ability to learn from the others.

- Successful learning from text and the consequent development of comprehension skills require the employment of both strategies and knowledge to build a mental or situation model from the given textbase. A high standard for coherence (a demand for the text to make sense) then drives comprehension monitoring. This recruits many of the same strategies that are called upon when comprehension breaks down (Perfetti, Landi, & Oakhill, 2004; Van den Broek, Risdien, & Husebye-Hartman, 1995; Van den Broek et al., 2001). If students engage in this process frequently, the use of strategies becomes more automatic and habitual, and the strategies become skills (Afflerbach, Pearson, & Paris, 2008). If students do not employ this process when reading expository text then the resultant learning is superficial and short lived (Kintsch, 1998; Kintsch, in Tobias and Duffy, 2009).
- Shallow reading from complex expository texts—skimming for answers, focusing only on details, and failing to make inferences in order to integrate different parts of the text, to connect to background knowledge, and therefore form a rich situation model—will do more than impede students' ability to read complex text. It will likely cause reading ability to deteriorate. Years of reading expository text in this superficial way gives students the message that expository text itself is shallow, thus reading it is an inevitably shallow and unrewarding exercise. The messenger, in this case, has been slain.

In sum, the texts students are provided in school to read K-12 are not of sufficient complexity to prepare them for college or career readiness. In addition, expository text, the overwhelmingly dominant form of career and college reading, constitutes a minute portion of what students are asked to read in pre-collegiate education. When it is read, it is over scaffolded by teachers, and taught superficially (read these pages, and find the answers). Far too many students are not only ill prepared cognitively for the demands this type of text presents; but are unaware there is even a problem, aside from how boring their informational texts seem to be. Those quarter million students who scored at levels no better than chance on the ACT likely had no idea how poorly they did. About to leave high school, they were blind-sided by tasks they could not perform on text passages they had never been equipped to encounter.

Given all of this, it is not surprising that Heller and Greenleaf (2007), in findings that paralleled the ACT Between the Lines study, found that advanced literacy across content areas (reading of expository, subject focused text), is the best available predictor of students' ability to succeed in introductory college courses. Nor surprising that in a synthesis of national and international reports on adolescent

literacy prepared for the Vermont Principals Association (Liben unpublished Power Point, 2007), we found that all nine called for enhancements in content area reading.

WHAT ARE SOME CONSEQUENCES OF SO MANY STUDENTS LEAVING HIGH SCHOOL UNABLE TO READ COMPLEX TEXT?

In addition to the findings noted in the ACT study:

- 20% of college freshman required remedial reading courses (NCES, 2004b). This is especially significant in light of the fact that 11 states have already passed laws “preventing or discouraging” enrollment in these classes in public four-year institutions (Jenkins & Boswell, 2002). In fact, students who enroll in these courses are 41% more likely to drop out than other students (NCES, 2004A).
- Only 30% of students enrolled in *any* remedial reading course went on to receive a degree or certificate (NCES, 2004).
- Differences between students in top brackets and all others, on measures such as NAEP test scores and AP courses successfully completed, have increased, (National Pipeline Data, 2005).
- Over 75% of surveyed students who dropped out indicated that difficulty with reading was a major contributing factor (Lyon, 2001).
- According to the National Assessment of Adult Literacy (2003), 15% of adults scored as proficient in 1992 and only 13% in 2003, a statistically significant difference in a decade.

The National Endowment for the Arts, in *Reading at Risk* (NEA, 2004), reports the following:

- The percentage of U.S. adults reading literature dropped from 54.0 in 1992 to 46.7 in 2002, a decrease of 7.3 percent in a decade.
- The percentage of adults reading *any book* likewise dropped by 7 percent in the same period.
- The rate of decline was in all demographic groups—women and men; whites, African Americans, and Hispanics; all education levels; and all age groups.
- Though all age groups are reading less, the steepest decline by far is in the 18–24 and 25–34 age groups: 28% and 23%, respectively. In other words, the problem is not only getting worse *but doing so at an accelerating rate*.

The NEA study cites declines in reading beginning in 1982 with 18- to 24-year-olds. Hayes cites a decline in difficulty of text beginning in 1962. It is tempting to link these findings, as 18- to 24-year-olds in 1982 began school from 1969–1975 and the Hayes study cites text difficulty decreasing beginning in 1962.

CONCLUSION

Being able to read complex text critically with understanding and insight is essential for high achievement in college and the workplace (Achieve, 2007, ACT, 2006). Moreover, if students cannot read challenging texts with understanding, they will read less in general, extending the societal effects the *Reading at Risk* report already documented. If students cannot read complex expository text, they will likely turn to sources such as tweets, videos, podcasts, and similar media for information. These sources, while not without value, cannot capture the nuances, subtlety, depth, or breadth of ideas developed through complex text. Consequently, these practices are likely to lead to a general impoverishment of knowledge, which in turn will accelerate the decline in ability to comprehend challenging texts, leading to still further declines. This pattern has additional serious implications for the ability of our citizens to meet the demands of participating wisely in a functional democracy within an increasingly complex world.

The ACT findings in relation to performance on the science test bear repeating. The need for scientific and technical literacy increases yearly. Numerous “STEM” (Science Technology Engineering Math) programs are beginning to dot the educational map. Yet only 5% of students who did not meet the ACT reading benchmark met the science benchmark. Science is a process, but it is also a body of knowledge. This body of knowledge is most efficiently accessed through its texts. This cannot be done without the ability to comprehend complex expository text.

A final thought: the problems noted here are not “equal opportunity” in their impact. Students arriving at school from less-educated families are disproportionately represented in many of these statistics. The stakes are high regarding complex text for everyone, but they are even higher for students who are largely disenfranchised from text prior to arriving at the schoolhouse door.

Bibliography: Why Text Complexity Matters

Achieve, 2007 Closing the Expectations Gap. Washington, DC: Achieve, Inc.

Afflerbach, P., Pearson, P., & Paris, S.G. (2008, February). Clarifying Differences

Between Reading Skills and Reading Strategies. *The Reading Teacher*, 61(5), 364–373
American College Testing (2006)“Reading Between the Lines: What the ACT Reveals about College Readiness in Reading” American College Testing, Iowa City: Iowa.

Biancarosa, G & Snow, C, (2004) Reading Next: A Vision for Action Research In Middle and High School Literacy. Alliance for Excellent Education. New York: Carnegie Corporation.

Best Practices National Governors Association (2005) Reading to Achieve: A Governor’s Guide of Adolescent Literacy. Wasington, DC: National Governor’s Association.

Bowen, G.M., & Roth, W.-M. (1999, March). “Do-able” questions, covariation, and graphical representation: Do we adequately prepare reservice science teachers to teach inquiry? Paper presented at the annual conference of the National Association for Research in Science Teaching, Boston, MA.

Bowen, G.M., Roth, W.-M., & McGinn, M.K. (1999). Interpretations of graphs by university biology students and practicing scientists: towards a social practice view of scientific representation practices. *Journal of Research in Science Teaching* .

Bradshaw, T., (2004)“Reading at Risk” Washington, DC: National Endowment for the Arts

Chall, J. (1977) An Analysis of Textbooks in Relation to Declining SAT Scores. Educational Testing Service, Princeton, NJ.

Glenn B. Milewski, Daniel Johnsen, Nancy Glazer, and Melvin Kubota 2005, A survey to evaluate the alignment of the new SAT Writing and Critical Reading Sections to

Curricular and Instructional Practices College Board Research Report No. 2005-1. ETS RR-05-07

Gioia, D., (2007)”To Read or Not to Read: A Question of National Consequence” Washington, DC: National Endowment for the Arts.

Hayes, D & Ward, M (1992) Learning from Texts: Effects of Similar and Dissimilar Features of Analogies in Study Guides. Paper presented at the Annual Meeting of the National Reading Conference (42nd, San Antonio, TX, December 2-5, 1992). Education Trust.

- Hayes, D., Wolfer, L. & Wolfe, M. (1996) Schoolbook Simplification and Its Relation to the Decline in SAT-Verbal Scores. Scholastic Aptitude Test
- Heller, R & Greenleaf, C (2007) *Literacy Instruction in the Content Areas: Getting to the Core of Middle and High School Improvement*. Washington, DC: Alliance for Excellent Education.
- Hiebert, E.H., & Kamil, M.L. (Eds.) (2005). *Teaching and learning vocabulary: Bringing research to practice*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Hiebert, E. (Ed.), *Reading more, reading better: Are American students reading enough of the right stuff?* New York: Guilford Publications, 2009.
- Hoffman, J. et al., (1994) *Building a Culture of Trust*. Journal of School Leadership, v4 n5 p484-501 Sep 1994.
- Jenkins, D & Boswell, K. (2002). State Policies on Community College Remedial Education: Findings from a National Survey. Denver: Education Commission of the States.
- Kays, J., & Duke, N. K. (1998). Getting students into information books. *Teaching PreK-8*, 29(2), 52-54.
- Kintsch, W. (1998) *Comprehension: A paradigm for cognition*. New York: Cambridge University Press.
- Kintsch, W. (2009) Learning and constructivism. In S. Tobias & T. M. Duffy (Eds.) *Constructivist Instruction: Success or failure?* New York: Routledge. Pp. 223-241
- Lyon, G. R. (2002). *Testimonies to Congress 1997–2002*. Covington, LA: Center for Development & Learning.
- Magliano, J. P., Millis, K. K., Ozuru, Y., & McNamara, D.S. (2007). A multidimensional framework to evaluate reading assessment tools. In D.S. McNamara (Ed.), *Reading comprehension strategies: Theories, interventions, and technologies* (pp. 107-136). Mahwah, NJ: Erlbaum
- McNamara, D, Graesser, A, and Louwrese: Sources of Text Difficulty: Across the Ages and Genres Memphis: University of Memphis
- Moss & Newton, 2002; An Examination of the Informational Text Genre in Basal Readers. [Reading Psychology](#), v23 n1 p1-13 Jan-Mar 2002.
- National Assessment of Adult Literacy (2003) Washington, DC: National Center for Education Statistics.

National Summary Educational Pipeline Data Profile, Achieve Inc. February 2005
Perfetti, C. A., Landi, N., & Oakhill, J. (2005). The acquisition of reading comprehension skill. In M. J. Snowling & C. Hulme (Eds.), *The science of reading: A handbook* (pp. 227-247). Oxford: Blackwell.

Shanahan, Timothy; Shanahan, Cynthia. (2008) Teaching Disciplinary Literacy to Adolescents: Rethinking Content-Area Literacy Harvard Educational Review (0017-8055) Spr 2008. Vol.78, Iss.1; p.40-59 Snow, 2002

Stenner, A J Koons, H and Swartz, CW: Text Complexity, the Text Complexity Continuum, and Developing Expertise in Reading. Research Triangle Park, North Carolina: MetaMetrics

U. S. Department of Education. National Center for Educational Statistics. (2004b). Tuition costs of colleges and universities.

van den Broek, P., Risden, K. & Husebye-Hartmann, E. (1995). The Role of Readers' Standards for Coherence in the Generation of Inferences during Reading. In Lorch, R. F. and O'Brien, E. J. (eds.) *Sources of Coherence in Reading*, 353-373. Lawrence Erlbaum: Hillsdale, NJ

P van Den Broek, R. F. Lorsch, Jr, T. Linderholm, M. Gustafson. (2001) The effects of readers' goals on inference generation and memory for texts Mem Cognit 2001 29:1081-1087

Williamson, G Aligning the Journey With the Destination: A Model for K-16 Reading Standards. North Carolina: Metamatrix.

Williamson GL 2006 Aligning the Journey With the Destination A Model for K-6 Reading Standards, A White Paper from the Lexile Framework for Reading

Yopp & Yopp, 2006 Primary Students and Informational Texts Science and Children, v44 n3 p22-25 Nov 2006. 4 pp. (Peer Reviewed Journal)