



1350L | Lexile: Matching readers to text

STUDENT READINESS FOR POSTSECONDARY OPTIONS

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A Paper from The Lexile Framework for Reading

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Executive Summary

Students who leave high school successfully may nevertheless be unprepared for the array of possibilities that face them in the postsecondary world. Whether the goal is further education, a job, or enlistment in the military, there are those who say that high school graduates are unprepared because of a lack of basic skills attained in the public schools. Some even question whether young adults have developed enough basic literacy skills to function effectively as citizens.

Apparently however, no one has actually looked systematically at the text demands of high school in contrast to those of college, the workplace, the military and citizenship to determine if there is a gap in the literacy requirements. If such a text gap exists then an apparent gap in student performance or preparedness could actually be a function of different text demands rather than purely a gap in student ability.

To put it another way, public school graduates may have learned very well what they were taught; but if there is a gap between the literacy demands of the high school curriculum and the requirements of various postsecondary options, then students will still appear to be unprepared. However, to ascertain whether the gap is purely an ability gap or whether there is also a textual gap requires that both ability and textual difficulty be measured. Doing this necessitates a method that places both text and student ability on the same scale.

Using The Lexile Framework[®] for Reading, this report directly addresses the issue of whether there is a gap between high school textbooks and various reading materials in the most widely chosen postsecondary domains of endeavor. These results are juxtaposed with previously reported conclusions about the readiness of students for postsecondary options.

It is fairly clear that a gap exists between the text demand placed on students by high school textbooks and the text demands of reading materials likely to be encountered in various postsecondary options typically considered by students. Regardless of whether a student aspires to postsecondary education, a job, the military, or just to be an informed citizen, the reading ability required is likely to be higher than what is typically required in high school based on texts that are widely used in this country.

This finding is consistent with much of the extant literature about readiness for postsecondary options, but it gives a new insight to the possible response to the situation. This report calls for a more systematic effort to identify and quantify the reading ability gap and the text demand gap in terms of a metric for both ability and textual difficulty. The advantage would be more meaningful measurement of reading ability in light of text demands and findings that are more conducive to instructional interventions and policy actions.

Student Readiness for Postsecondary Options

Introduction

Too many students who successfully complete high school are nevertheless unprepared for the array of possibilities that face them in the postsecondary world. This is the claim made by a number of authors over the last few decades. Whether the goal is further education, a job, or enlistment in the military, there are those who say that high school graduates (and also, those who do not graduate) are unprepared because of a lack of basic skills attained in the public schools. In effect, it has been asserted that there is a gap between students' abilities and the requirements of the workplace, the military, and postsecondary educational institutions. Some question whether young adults have even developed enough basic literacy and numeracy skills to function effectively as citizens.

A variety of statistics have been quoted to support these views. Some focus on student behaviors and attainments, such as high school dropout rates and/or graduation rates. Some focus on analogous later events, such as the rates at which college students require remediation or fail to complete their program of study. Other reports focus on the skill demands of the workplace in contrast to what students have been taught in school. Still others focus on the literacy demands of citizenship. College transcripts, student course completions, and finally, student performance have all been used as indicators of college readiness.

Apparently however, no one has actually looked at the text demands of high school in contrast to those of college, the workplace, the military, and citizenship to determine if there is a gap in the literacy requirements. If such a gap exists, then an apparent gap in student performance or preparedness could actually be a function of different text demands (in essence the standards expected for different activities) rather than purely a gap in student ability. To put it another way, graduates may have learned very well what they were taught; but if there is a gap between the literacy demands of the high school curriculum and the requirements of various postsecondary options, then students will still appear to be unprepared. However, to ascertain whether the gap is purely an ability gap or whether there is also a textual gap requires that both ability and textual difficulty be measured. To do this requires a method that places both text and student ability on the same scale.

The Lexile Framework for Reading

The Lexile Framework for Reading is a scientific approach to reading measurement that matches readers with text. The Lexile Framework measures both reader ability and text difficulty on the same scale, called the Lexile[®] scale. This approach allows educators to manage reading comprehension and encourage reader progress using Lexile measures and a broad range of Lexile products, tools and services.

The Lexile Framework was developed by MetaMetrics Inc., an independent education company focused on using technology to bridge assessment and instruction, after 15 years of research funded by the National Institutes of Health. It has since become a widely adopted reading measure—tens of thousands of books and tens of millions of articles have Lexile measures, hundreds of publishers Lexile their materials, and all major standardized tests can report student reading scores in Lexiles. Lexiles enable educators to choose confidently materials that will improve students’ reading skills across the curriculum and at home.

Regrettably, few researchers have used the Lexile scale when investigating the readiness of students for postsecondary options in life. This paper seeks to make a first step toward filling that gap.

The Approach Taken in This Paper

Although analyses of postsecondary readiness typically focus on skills and knowledge in the areas of reading and mathematics, this paper will focus on reading ability with the confidence that many of the central issues will be similar for mathematics. The perspective of this paper is that both text demand and reader ability are important. The issue of a reading ability gap between high school and postsecondary life activities is important; but it is only half the story. An important missing piece is the issue of whether there exists a gap in the actual text demands required by different postsecondary activities. By analyzing a range of textual material from K-12 education, postsecondary education, the military, the workplace and the world of citizenship, it should be possible to more scientifically consider whether there appears to be a gap in textual difficulty between these various endeavors of life. This approach will suggest a similar effort with respect to actual human ability in these various roles in an effort to more systematically address the issue of student readiness for life after the K-12 years.

The approach of this paper is intended to be illustrative and does not constitute an exhaustive investigation. Nor is it the purpose of this paper to provide a complete review of literature or extant data sources about student readiness. Rather a few readily available articles and reports are described to motivate the investigation and to give a flavor of the views expressed by previous writers; additionally, the next section describes selected data sources that were readily available for the analyses reported in this paper. The conceptual framework for the approach is the key issue of importance for future investigations. The results that are presented will provide a sample of what a more exhaustive analysis could show.

The paper begins with a review of textual resources and a sampling from the literature on an ability gap, followed by a description of the methodology used for this report. After that, results are presented to describe the text demand for high schools, postsecondary education, the workplace, the military and selected activities of citizenship. The paper concludes with a summary and a discussion of desirable next steps.

Review of Resources and Literature on the Issue

The resources used for this paper are organized into four domains and are displayed in a matrix format in Table 1. There are four rows in the table, corresponding to the four major domains of interest for this paper. The first three rows correspond to the three major postsecondary options that students have: education, the workplace and the military. The fourth row corresponds to the broad area of citizenship, which cuts across all of the postsecondary options.

The first column of the table simply lists these four domains, thereby labeling each row of the table. The second and third columns show the resources pertaining to text readability and reading ability, respectively, in each of the four domains.

Resources related to text

The second column of Table 1 lists various resources that relate directly to the text demands in each domain. For the educational domain, MetaMetrics, Inc. draws upon a library of over 4,400 textbooks used in public schools in the United States. Each of these texts has been measured on the Lexile scale and possesses a Lexile measure that represents its reading demand.

A resource recently provided through collaboration with Questia Media America, Inc. consists of texts used at the community college and/or university (13-14) levels. As a library, Questia focuses on texts used in the humanities and social sciences. For this study, they focused on university courses that most if not all freshmen and sophomores will have to take, and selected 100 titles for analysis. Similarly, they selected 50 titles representing materials that students in community colleges typically encounter. Questia analyzed these texts to assign Lexile measures. (This was possible using software called the Lexile Analyzer, provided by MetaMetrics, Inc. and described in more detail in the Methodology section below.)

In the workplace domain, this study draws upon the previous work of Willard R. Daggett of the International Center for Leadership in Education (ICLE). Dr. Daggett has independently analyzed reading material for 16 career clusters identified by the U.S. Department of Education and determined the Lexile measure for each text. (ICLE also used the Lexile Analyzer provided by MetaMetrics, Inc. for this task.)

For the military domain, MetaMetrics, Inc. examined a variety of material available through the U.S. Army website. First, selected army news service articles were analyzed for their reading demand. Second, selected articles were analyzed from the Professional Writing Collection featured on the Army website. Third, the document *225 Years of Service* was used, as it appeared to be a featured general paper on the history of the military. Fourth, the *Soldier's Handbook* was analyzed. Finally, the reading demand was calculated for a selection of field manuals, training circulars, drills and other documents used for various branches of the armed services. In general, these are official departmental publications available from the General Dennis J. Reimer Training and Doctrine Digital Library.

In the domain of citizenship, MetaMetrics, Inc. examined a variety of materials representing different aspects of citizenship. These included newspapers, the U.S. District Court's *Handbook for Trial Jurors*, material about voting rights and responsibilities from the N.C. State Board of Elections website, the Internal Revenue Services' (IRS) 2003 Form 1040 instructions, public online information about state marriage laws, and the North Carolina Department of Motor Vehicles' *Driver's Handbook*. Lexiles calculated by ICLE for eleven similar documents were also included in the analysis.

Resources related to reading ability

The final column of Table 1 shows a sampling of studies and/or recent literature related to student ability. In the domain of K-12 education, there is a wealth of material ranging from analyses done by United States governmental agencies, to journal articles and monographs published by university faculty and/or private institutions, to reports in state and national newspapers, to informal pieces available online from different writers. Specific examples are shown in the table.

There are relatively fewer sources available relating to actual measured reading ability of young adults in the domains of 13-14 education, the workplace, the military and citizenship. However, there have been a few national studies conducted by the federal government. The corresponding cells in Table 1 reflect this and some related reports are listed in the Bibliography.

Methodology

The approaches used to investigate textual difficulty and reader ability for this brief are explained in the following two subsections.

Text

Identification and description of texts. Nearly 50,000 books and 70 million newspaper and magazine articles have received Lexile measures to date. Some of these books and articles were measured by various users and are not generally available for inspection. However, tens of thousands of books are searchable in the online Lexile Book Database maintained by MetaMetrics, Inc.; and, tens of millions of articles are searchable in periodical databases. [These are a subset of the "measured" books and articles. The actual number available at any given time fluctuates and depends on the number of titles added to the Lexile Book Database and the number of measured articles to which major users (e.g., ProQuest and EBSCO) choose to attach a Lexile measure in their databases.]

For this paper, textual sources for K-12 education were drawn from the extensive library that has been built and maintained by MetaMetrics, Inc. over the last 20 years. Included in this library are over 4,400 textbooks used in the public schools of the United States. From these, 132 are texts used in the high school grades (9-12); among these only 23 were specifically coded as being 11th grade or 12th grade texts. These 23 were selected for statistical summary for this paper.

This paper focuses on texts for the last two years of high school compared to the first two years of university and community college to specifically represent the text gap between high school and postsecondary education, if there is one.

Texts for the beginning (freshman and sophomore years) of university education were identified and provided courtesy of Questia, through collaboration with MetaMetrics, Inc. These texts represented courses in the humanities and social sciences that most if not all freshmen and sophomores have to take. The texts reflected the content often required in the courses. Courses included (among others):

- American Literature
- English Composition
- World Literature
- US History
- World History and Civilization
- Psychology and/or Sociology
- Philosophy
- Understanding Humanities
- Music or Theater or Visual Art Appreciation
- Introduction to Business
- Introduction to Economics
- Introduction to Education

For community college, the books selected from the Questia collection represent the variety of materials used in the most popular fields of community college study. The fields of study include: business, social and community service, health, education, design/arts, and technology/science.

These university and community college texts were analyzed to produce Lexile measures for each text. These Lexile measures were then summarized statistically.

Textual sources for the workplace were identified by the International Center for Leadership in Education (ICLE). They have identified over 1,400 examples of occupational reading material. These have been classified into 16 career clusters. ICLE analyzed the texts to obtain a Lexile measure for each. This database was analyzed for this paper to obtain a summary of the Lexile measures for workplace materials.

Textual sources for the military were identified largely through the U.S. Army website listed in the notes to Table 1 and described in the Resources section above. A sample of publications was downloaded from these sites and analyzed to produce Lexile measures, which were statistically summarized.

Textual sources for citizenship were also obtained through various websites as described earlier and as listed in the notes to Table 1. These materials were also analyzed to produce descriptive statistics.

Obviously the choice of materials can have an effect on the results of these analyses. Analyzing all possible materials from the domains of interest would be an unending task. As the study was limited by time, choices had to be made. We analyzed the available texts from the MetaMetrics, Inc. and Questia databases that conformed to the grade range requirements for the study. We also analyzed all of the workplace materials available from the ICLE. Materials from the citizenship realm were chosen to represent typical sources of printed information that most people might encounter in daily life. Materials from the military reflect a variety of sources ranging from the mundane to the more technical and tactical. While these materials are not exhaustive, they were chosen because they may be representative of materials from these domains. To the extent they are not, then results should be interpreted with caution.

The Lexile Analyzer. A Lexile measure is the specific number assigned to a text that describes the reading demands of the text. Software called the Lexile Analyzer is used to compute the Lexile measure. The Lexile Analyzer carefully examines the entire text to measure sentence length and word frequency—characteristics that are highly related to overall text comprehensibility. Using the information about the text and the theory provided by the Lexile Framework for Reading (e.g., Stenner & Burdick, 1997; Wright & Linacre, 1994), the Lexile Analyzer arrives at a Lexile measure for the text.

The Lexile measure of a text is a number indicating the reading demand of the text in terms of the semantic difficulty (vocabulary) and syntactic complexity (sentence length). In general, the Lexile scale ranges from 200 to 1700 Lexiles although actual Lexile measures can be lower or higher. Additional details about the Lexile Framework for Reading and the Lexile Analyzer can be found at www.lexile.com.

Application to text sources. A Lexile measure is assigned to a text through a two-stage process. First, the entire text is digitized, formatted and analyzed. All electronic files are formatted according to established guidelines used with the Lexile Analyzer software. These guidelines include the removal of all incomplete sentences, chapter titles and paragraph headings; running of a spell check; and re-punctuating where necessary to correspond to how the book would be read by a young child (for example, at the end of a page). The text is submitted to the Lexile Analyzer, which examines the lengths of the sentences and the frequencies of the words, and then reports a Lexile measure for the text.

The second step in the process is to review the Lexile measure for the text in terms of the actual layout of the text and the publisher's reported reading and interest levels (if provided). At this time, a Lexile code may be assigned. The Lexile measure and Lexile code of the book are added to the Lexile Book Database and reported to the publisher and various trade book distributors (as appropriate).

Lexile measures were determined in this manner for the materials described earlier in the paper. Findings are presented in the Results section. Before that however, the next section describes the methodology used to address the potential existence of a reading ability gap between high school and postsecondary options.

Ability

Identification and description of sources. It is not the intent of this paper to undertake a comprehensive review of all of the literature about student performance during and after the public school years. That literature is enormous and has accumulated for decades. The public discussion in this area has been protracted, often characterized by pejorative conclusions regarding the effectiveness of the public schools and thus also has frequently been riddled with disagreement. It is unlikely (and is probably not possible) that a short paper could begin to unravel the many differences that exist. They run the gamut, spanning issues of conceptualization, data collection, research methodology, data analysis procedures, methods of reporting, and ultimately, interpretation.

As will be explained below, it is currently impossible to construct valid comparisons of actual measured student performance that can be compared across the same domains used with the text measures produced for this report. Consequently, this paper merely employs a few examples from existing literature to illustrate some of the concerns that have been raised about student readiness for postsecondary options. No claim is made as to the accuracy or generalizability of the reported results. The interested reader is directed to the original sources for fuller explanation.

Lack of a commonly used metric for reading ability. In spite of the fact that the Lexile Framework for Reading is the most widely used metric for reading ability, it is still far from universally used. Additionally, it has been used most frequently to assist teachers in matching readers with text. It has been used hardly at all to facilitate comparisons of reading ability. In fact, it is still the case that there is no systematic national assessment in the United States that would yield scores to address the comparisons of interest in this paper. While there are numerous testing programs in the public schools, and some even use tests that have been linked to the Lexile scale, the assessments are unique to each state and generally not comparable from one state to another. Different states test in different grades, at different times of year, in different subjects, etc. The National Assessment of Educational Progress (NAEP) provides results for reading in grades four, eight and twelve at the national level, but NAEP has not been linked to the Lexile scale. [Note: The National Assessment Governing Board (NAGB) is considering recommendations to revamp and expand the 12th grade NAEP (NAGB, 2004).]

Our military uses the Armed Services Vocational Aptitude Battery (ASVAB) to determine eligibility for enlistment and for assignment to specific military jobs. And, there have been national studies in which the ASVAB was administered to a national sample of young men and women to establish norms. However, the ASVAB has not been linked to the Lexile scale and is not comparable to other tests used in the public schools.

The national assessments that have been conducted of adults in the workplace or in their roles as citizens have been infrequent. They have been designed as adult literacy studies, and initiated as surveys that included literacy tasks. However, the measures were unique to the studies and their scales have not been linked to measures commonly used in the public schools or the colleges and universities.

Effects on comparability of previously reported results. The effect of not having a commonly used metric for reading ability is that reported results are by and large not comparable from one study to the next. The constructs vary and the metrics differ. Consequently, it is not uncommon for writers to use proxy measures for student readiness that have little or no direct relation to reading ability. Consequently, attempts to interpret the literature on reading ability and postsecondary readiness should be undertaken with some reluctance and with great caution. Still, people do attempt to interpret the results and frequently derive alarming messages. Some examples will be given in the second half of the Results section.

Results

The results are presented in two subsections. First, the results of MetaMetrics' text analyses are presented. Secondly, a sampling of quotations from previously reported results of reading ability is presented.

Text

Table 2 shows the distributions of Lexile measures for texts in each domain. For comparative purposes, the analyses focused on high school texts for 11th and 12th grades to summarize the text demand near the end of high school. Texts for the first two years of college/university were used as an indication of text demand near the beginning of postsecondary education. The texts for the workplace, the military, and citizenship are as described in the Resources and Methodology sections.

The table shows the number of texts from each domain and selected percentiles from the distributions of Lexile measures. The median (50th percentile) Lexile for texts used near the end of high school (1090L) is considerably lower than the median Lexiles for texts at the beginning of college, or for the other domains (workplace, military and citizenship). The differences range from 90 Lexiles (between the high school and the military texts) to 265 Lexiles (between the high school and the college/university texts).

Of course, there is even more variability within each text domain, with different domains overlapping in their text difficulty. However, it is striking that the 95th percentile of the high school texts is lower than the median Lexile of texts from the other domains. This means that not only is the typical end-of-high school text lower in its text demand, but the vast majority of high school texts require less reading ability than most of the reading material students are likely to encounter after high school. Furthermore this is true irrespective of whether the student chooses to pursue higher education, seek a job, enlist in the military or simply try to function as a citizen.

This contrast indicates that there most likely exists a sizable difference in the text demand placed on students as they complete high school compared to what they will face in the postsecondary world. It indicates a considerable gap between the reading requirements of high school and those of later life.

Figure 1 expands on the summary in Table 2 to provide a picture of a continuum of text difficulty from high school textbooks to graduate school admissions tests. Undergraduate school admissions tests and graduate school admissions tests have been added to the picture. The community college texts are depicted separately from beginning university texts. The figure shows the distributional summaries of Lexile measures in each text collection. The text collections are arranged in increasing order of their medians.

It is interesting to note in Figure 1 that there are increasing steps of approximately 100L between the median measures for: a) high school texts and undergraduate admissions tests; b) undergraduate admissions tests and community college texts; and, c) community college texts and university texts. These three successive 100-point gaps accumulate to a total text gap of 305L between the median high school and university (13-14) text measures.

Ability (previously reported results)

Because there is no universally used common metric(s) for reading ability, it is impossible to construct a table for actual measured reading ability analogous to the table for text demands that was presented in the previous section. Consequently, the best that can be done is to summarize some of the findings from the many studies and metrics that have been used to investigate the reading performance of students at various stages of their development. In doing this, one must realize that the various results are not comparable to each other. However, it is useful to review some of the thoughts that others have expressed related to the performance of students in high school and their readiness for what will be encountered after high school.

The following subsections present conclusions and observations from different reports on education. They are organized into the domains of education (K-12 and 13-16), the workplace, the military and citizenship. Within domain, quotations are organized according to report with citations identifying the respective report listed in the Bibliography.

Education (K-12)

The most pervasive result of the National Adult Literacy Survey is that level of formal schooling is strongly related to adult literacy proficiency. This may strike some as surprising, given much recent criticism of schools for failing to teach reading effectively and for failing to make school learning relevant to real-life tasks. Nonetheless, increased levels of formal schooling correlated with substantial gains in adult literacy proficiency for all groups, at all levels of education. (p. xxiii)

-- Kaestle, Campbell, Finn, Johnson, & Mickulecky (2001)

“...31 percent of fourth-graders and 32 percent of eighth-graders performed at or above the *Proficient* level in 2003. The percentage of students performing at or above the *Basic* level in 2003 was 63 percent at grade 4 and 74 percent at grade 8.”

-- 2003 NAEP Reading results, grades 4 and 8

In 2002, the “percentages of twelfth-graders who performed at or above the *Basic* [74%] and *Proficient* [36%] levels ... fell below levels seen in 1992.”

-- 2002 NAEP Reading results, grade 12

A high school diploma should signify that students are prepared for their next steps in life. ... But the large gap that exists between these tests [state exit exams] and the real-world expectations of colleges and employers is clear evidence that these tests are not aiming too high; in fact, one could argue they are not aiming high enough. (pp. 30-31)

--Achieve, Inc. (2004)

...schools have a special role to play in raising community standards. (p. 95)

...Young people from communities with a higher achievement standard have a marked advantage ... Everyone would benefit from the diffusion of higher achievement standards. (p. 164)

-- Bock & Moore (1986), *Advantage and Disadvantage: A Profile of American Youth*

Only 70% of all students in public high schools graduate, and only 32% of all students leave high school qualified to attend four-year colleges.

-- Greene & Forster (2003)

Students at risk were defined as 1992 high school graduates who had risk characteristics that increased their chances of dropping out of high school. ... About 58 percent of 1992 high school graduates had one or more risk factors;

Among 1992 high school graduates with no risk factors, 58 percent successfully navigated the pipeline to enrollment in a four-year college, compared with 30 percent of students at risk ...

At-risk students most differed from their counterparts not at risk in relation to their educational aspirations ... and academic preparation Just over half (56 percent) of at-risk students aspired to a bachelor's degree in the tenth grade, compared with four out of five students (81 percent) not at risk. About 44 percent of at-risk students ... were at least minimally prepared academically to attend a four-year college ..., compared with 75 percent of students not at risk.

-- Horn (1998)

High school transcripts for this cohort indicate that approximately 62 percent of the cohort pursued programs that would constitute college preparation; 38 percent were enrolled in general or vocational tracks

-- Sanderson, Dugoni, Rasinski, Taylor & Carroll (1996),
said of the 1988 eighth grade cohort from NELS:88

This study calculates the financial costs incurred by Michigan business and institutions of higher learning when students leave high school without learning basic skills. ... The best estimate ... is \$601 million per year. Extrapolating to the entire United States, the lack of basic skills costs a total of approximately \$16.6 billion each year.

--Greene (2000)

Education (13-16)

“... high school assessments often stress different knowledge and skills than do college entrance and placement requirements. Similarly, the coursework between high school and college is not connected; students graduate from high school under one set of standards and, three months later, are required to meet a whole new set of standards in college. Current data systems are not equipped to address students' needs across systems, and no one is held accountable for issues related to student transitions from high school to college.” (p. 1)

-- Venezia, Kirst & Antonio (2003)

“... students who perform poorly in high school probably won't graduate from college—many won't even make it beyond remedial courses.... (p. 1)

Forty-four percent of those from the class of 1982, ... 25 percent from the class of 1992 ... took at least one remedial course. (p. 3)

“... only 45 to 49 percent of students who enter college and earn more than 10 credits actually earn a bachelor’s degree For students with high school averages of C or lower, the chances that they will earn even one college credit are less than 50-50 ...” (p. 1)

-- Rosenbaum (2004)

In fall 2000, about three-fourths (76 percent) of the Title IV degree-granting 2- and 4-year institutions that enrolled freshmen offered at least one remedial reading, writing, or mathematics course. (p. iii)

In fall 2000, 28 percent of entering freshmen enrolled in one or more remedial reading, writing, or mathematics courses. (p. iv)

--U.S. Department of Education, National Center for Education Statistics (2003)

While almost a third (31 percent) of the 1972 cohort who entered [postsecondary education] right after high school completed a bachelor's degree within the 4 1/2 year period, less than a quarter (22 percent) of the 1980 cohort did so in the same length of time.

Overall, baccalaureate degree completion in 4.5 years for the 1980 cohort dropped about 10 percentage points below that of the 1972 cohort. This same 10 percentage point drop was evident for all groups, regardless of race, sex, or socioeconomic status (SES).

-- Knepper (1990), from the NLS:72 and HS&B:80

Slightly less than one-half of 1980 and 1982 high school seniors enrolled in postsecondary institutions in the first academic year following graduation.

-- Carroll, C. D. (1988) based on HS&B:80

About one-third of the graduating high school class of 1980 never enrolled in any type of postsecondary education. Slightly more than one-fourth entered 4-year colleges full time in the fall immediately following graduation to pursue bachelor's degrees. The remaining two-fifths entered less-than-4-year institutions, attended part time, or delayed entry.

Of the 1980 high school graduates who immediately entered 4-year colleges, about 4 of every 7 (or about one-sixth of the entire 1980 graduating class) persisted full time for 4-years. Nearly three-fourths of these persisters attained bachelor's degrees.

Less than one-tenth of the 1980 graduates who entered less-than-4-year institutions, attended part time, or delayed entry subsequently attained bachelor's degrees by February of 1986.

-- Carroll, C. D. (1989) based on HS&B:80

Students' academic preparation and test scores were related to the number of credits they completed in the first year, as was their academic performance in the first year. For example, about half of those who scored in the top quartile on the HS&B cognitive test completed at least 30 credits, compared with one-third of those with scores in the middle quartiles and one-fifth of those who scored in the bottom quartile.

-- U.S. Department of Education, NCES (1999), HS&B results

Workplace

"... more than half of our young people leave school without the knowledge or foundation required to find and hold a good job." (p. i)

Today, we cannot precisely determine how many youngsters have skills at the SCANS work-ready level. Our only data source is the 1986 National Assessment of Educational Progress (NAEP) survey of 21 to 25-year-olds. Our staff compared the tasks ... with those assessed by the NAEP. On this basis we estimate that less than half of young adults can demonstrate the SCANS reading and writing minimums; even fewer can handle the mathematics. NAEP does not assess the competencies. But since they are rarely explicitly taught or assessed in school, it is likely that reading, writing and mathematics performance represents the upper limits of student proficiency. Further, today most schools do not address the listening and speaking skills directly. (p. 23)

-- U.S. Department Of Labor (June, 1991) SCANS Report.

Education researcher Willard Daggett thinks Collier County schools have to improve, or their graduates will lose jobs to global competition....

In his talk, Daggett said American graduates need the skills to compete, or face being surpassed by other countries....

Students must be able to read, especially since in many careers, entry-level employees were required to read complicated materials....

Many high school sophomores and seniors had difficulty reading above a 1,000 Lexile rating, according to state testing.

-- Parker, R. (2004) in the *Naples Daily News*

The study results ... show a substantial gap between the reading capability that students will need for success in the workplace and in adult roles and the reading skills those students now possess. (p. 1)

When all of this data is brought together, this [sic] is apparent that society in general and the workplace in particular demand higher levels of reading proficiency than schools. Moreover, many students are barely meeting those minimal education requirements. (p. 3)

-- Pennsylvania Department of Education (2004)

Military

Like aptitude levels, reading levels were higher in the enlisted military than in the non-military sector. FY 1997 NPS [non-prior service] active duty enlisted accessions had a mean reading level typical of an 11th grade student [typical reader measures are approximately 940-1210 Lexiles for eleventh & twelfth graders] whereas the mean for civilian youth was within the 10th grade range [approximately 905-1195 Lexiles].

-- U.S. Department of Defense (1998) [based on ASVAB verbal composite score conversions—see: http://www.defenselink.mil/prhome/poprep97/html/2-reading_ability.html.]

“... regardless of age, vocational test performance tends to remain near the level of the highest grade completed. In particular, failure to complete high school argues poorly for meeting vocational test standards at a later time through informal learning and experience. (p. 113)

-- Bock & Moore (1986), said of the performance on the Armed Services Vocational Aptitude Battery (ASVAB) in the *Profile of American Youth* study

Citizenship

Twenty-one to 23 percent -- or some 40 to 44 million of the 191 million adults in this country -- demonstrated skills in the lowest level of prose, document and quantitative proficiencies (Level 1). Some 25 to 28 percent of the respondents, representing about 50 million adults nationwide, demonstrated skills in the next higher level of proficiency (Level 2) on each of the literacy scales.

-- Kirsch, Jungeblut, Jenkins, & Kolstad (1993)--1992 NALS

“... Overall, civilians in the labor force displayed higher literacy skills than those out of the labor force, and employed workers outperformed the unemployed.

Still, more than 40 percent of those in the labor force posted literacy scores within the lowest two levels. Moreover, less than 5 percent of labor force participants had received any recent training in these basic skills. Together these findings paint a bleak outlook for the future of the United States labor market.”

-- Sum (2000), 1992 NALS

Summary and Conclusions

It is fairly clear that a gap exists between the text demand placed on students by high school textbooks and the text demands of reading materials likely to be encountered in various postsecondary options typically considered by students. The median text demand is fairly uniform across the workplace, military and citizenship domains, ranging from 1180L-1260L; but it is higher for postsecondary education (1355L). Regardless whether a student aspires to postsecondary education, a job, the military, or just to be an informed citizen, the reading ability required is likely to be higher than what is typically required in high school (1090L) *based on texts that are widely used in this country.*

Furthermore, there is a remarkably systematic continuum of increasing text demand that extends from high school texts to university texts. There appear to be regular increases of approximately 100L in reading difficulty from high school texts to undergraduate admissions tests, to community college texts to university texts. The overall gap between high school textbooks and university texts is a huge 305L. Extending to graduate school admissions tests results in a slightly larger gap—320L.

To put this in perspective, consider that 250L is the difference between 75% comprehension and 50% comprehension of text. From another perhaps more familiar point of view, this approximately 300-point difference would likely exceed one standard deviation of student scores on most standardized tests. Such a difference is very large by almost any educational standard.

It is possible that students supplement their high school academic experiences with ancillary reading material that is systematically higher in its reading demand than is the case for the textbooks typically used. In this study, there was no way to investigate the breadth of reading material actually used by high school students. To the extent that teachers assign or students elect to read more difficult texts than those typically required textbooks examined in this study, then the effective size of the text gap may be over-estimated in this report.

On the other hand, the university texts were chosen from the humanities and social science disciplines. Texts from the physical sciences, mathematics, engineering, etc.

were not represented. To the extent that such texts might require a higher level of reading ability, our quantification of the gap could be underestimated.

In fact, it is impossible to know exactly what the text gap between high school texts and college/university texts is without analyzing all such texts. However, the fact that there appears to be a substantial gap in text demand between widely used high school textbooks and typical postsecondary textbooks in the humanities and social sciences is cause enough for concern to those who are interested in educational standards and better alignment between the public school curricula and postsecondary options.

Similarly, it is quite possible that reading ability continues to improve well beyond the transition between high school and entry into postsecondary options. (This would be reasonable given existing evidence that we continue to grow in verbal ability into adulthood.) If that is the case then the reading ability gap that many authors infer may actually be underestimated. Again, this study could not investigate these possibilities, and existing studies of student performance do not adequately address the issue.

The existing literature on postsecondary readiness and reading ability is filled with concerns about the apparent gap between actual measured student reading ability and the reading requirements of later life. Concluding that there is such a gap and knowing its magnitude is problematic because different studies have used different constructs and metrics to investigate the effect. Yet the uniformity of conclusions that there is a problem is striking, and the calls for higher standards and better alignment between the public schools and other sectors has received more attention in recent times.

Taking the next steps will be difficult until something is done to better quantify the reading ability gap. Knowing the magnitude of the gap is only useful if one can also act sensibly on the information. In order for the information to be practicable, it must be expressed in a metric that has universal meaning both in terms of its quantification and in terms of its relation to instructional actions—that is, it must be possible to say how much of what intervention is needed to bridge the gap.

This is a signal advantage of the Lexile Framework for Reading. The fact that both readers and text can be quantified on the same scale makes it possible to match readers with texts that are appropriately targeted to their reading ability. Thus it is also possible to challenge readers enough to stimulate their improvement without inadvertently discouraging them by suddenly increasing the demand beyond their immediate capabilities.

To more definitively identify and quantify the gap between the reading ability of students when they are in high school and their reading ability once they leave high school and engage in various endeavors would require a more systematic study that follows specific students for several years, measures their reading ability on repeated occasions and also documents and measures the texts that they encounter in each context. This in turn would presume the ability to measure both reading ability and text difficulty on the same scale. Such a study would take several years and would likely be expensive.

Such a study would have several advantages over extant investigations however. It would overcome objections to differences in construct and metric. It would eliminate cohort differences as one possible explanation for observed differences in ability. It could also more faithfully represent the actual life courses chosen and events experienced by a nationally representative group of students. In this respect, it would have higher ecological validity than many studies that now claim to estimate the gap between reading ability and postsecondary reading requirements.

Other possible strategies might be mounted on existing assessments and studies periodically conducted by the federal government. For example, if the reading tests for NAEP were linked to a universal metric for both reading ability and text difficulty, then the generalizability of NAEP results would be greatly enhanced and the policy implications of NAEP findings would gain new value in terms of actionability. For example, if the NAEP reading tests were linked with the Lexile Framework for Reading, at least five significant benefits would accrue:

1. The NAEP tests could be located on the continuum of text difficulty;
2. Readers could be located on the same scale;
3. NAEP proficiency level descriptions could be richly annotated with texts that readers at different levels can read with success;
4. It would be possible to produce an implied comprehension rate for any reading proficiency scale result; and
5. New meaning would be imparted to previously reported results.

Not only could NAEP results become directly comparable with a variety of widely used national measures that are also linked to the Lexile Framework, but states that participate in NAEP could conceivably examine their textbook choices and their reading program initiatives more directly in light of the NAEP results for the state.

Similarly benefits could accrue if the measures used in other national studies were linked to the Lexile Framework for Reading. Consider the rich new information available if the National Assessments of Adult Literacy (NAAL), the National Longitudinal Study (NLS), High School and Beyond (HS&B), the National Education Longitudinal Study (NELS), the Armed Services Vocational Aptitude Battery (ASVAB) and other similar efforts were also linked. The results of each of these studies would suddenly have a basis for comparability; they would also be comparable to measures from linked nationally normed tests used in different states. Findings from all of these sources would suddenly have direct commonly understood instructional meaning in terms of the text demand implied for readers.

A by-product of this strategy might be that educational standards would have a basis for comparability across the nation, a situation that does not now exist. If that were achieved, then policy discussions and actions related to educational standards and accountability would be greatly facilitated. The ultimate benefactors would be the students and all who rely on them for the future of the country.

About The Author

Gary L. Williamson, Ph.D., is senior research associate with MetaMetrics, Inc. With more than 30 years of experience in educational research on the academic, state and school district levels, Williamson's specialty is quantitative methodology encompassing psychometric, mathematical and statistical applications to educational data. He most recently was educational research and evaluation unit director at the North Carolina Department of Public Instruction. He has written and spoken extensively on the subjects of educational assessment and accountability. Williamson earned both a doctorate of philosophy in mathematical methods for educational research and a master's of science in statistics from Stanford University. He also holds a master's of education in educational research and evaluation from The University of North Carolina at Greensboro, and a bachelor's of science in mathematics from The University of North Carolina at Chapel Hill.

About The Lexile Framework for Reading

The Lexile Framework for Reading (www.Lexile.com) provides a common scale for matching reader ability and text difficulty, allowing easy monitoring of progress. Lexile measures give teachers and parents the confidence to choose materials that will improve student reading skills across the curriculum and at home. Tens of thousands of books and tens of millions of articles have Lexile measures, and all major standardized tests can report student reading scores in Lexiles. As the most widely adopted reading measure in use today, Lexiles are part of reading and testing programs at district, state and federal levels. The Lexile Framework was developed by MetaMetrics, Inc. an independent education company based in Durham, N.C., after 15 years of research funded by the National Institutes of Health.

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Bibliography

- Achieve, Inc. (2004). *Do Graduation Tests Measure Up? A Closer Look at State High School Exit Exams*. Washington, DC: Achieve, Inc.
- Bock, R. D., & Moore, E. G. J. (1986). *Advantage and Disadvantage: A Profile of American Youth*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Carroll, C. D. (1988). Enrollment in postsecondary education of 1980 and 1982 high school graduates. Washington, DC: NCES.
- Carroll, C. D. (1989). College persistence and degree attainment for 1980 high school graduates: Hazards for transfers, stopouts and part-timers. Washington, DC: NCES.
- Greene, J. P. (2000). The cost of remedial education: How much Michigan pays when students fail to learn basic skills. Midland, MI: Mackinac Center for Public Policy.
- Greene, J. P. & Forster, G. (2003). Public high school graduation and college readiness rates in the United States. Education Working Paper, No. 3. Center for Civic Innovation at The Manhattan Institute.
- Hogan, D. W., Jr. (2000). *225 years of service: The U.S. Army, 1775-2000*. Washington, DC: Center of Military History, U.S. Army.
- Horn, L. J. (1998). Confronting the odds: Students at risk and the pipeline to higher education. Washington, DC: NCES.
- Kaestle, C. F., Campbell, A., Finn, J. D., Johnson, S. T., & Mickulecky, L. J. (2001). *Adult Literacy and Education in America*. Washington, DC: NCES.
- Kirsh, I. S., Jungeblut, A., Jenkins, L., & Kolstad, A. (1993). *Adult Literacy in America: A First Look at the Findings of the National Adult Literacy Survey*. Washington, DC: NCES.
- Knepper, P. (1990). Trends in postsecondary credit production: 1972 and 1980 high school graduates. Washington, DC: NCES.
- National Assessment Governing Board. (2004). *12th Grade Student Achievement in America: A New Vision for NAEP*. A Report to the National Assessment Governing Board by the National Commission on NAEP 12th Grade Assessment and Reporting. Washington, DC: National Assessment Governing Board. Available at: http://www.nagb.org/release/12_gr_commission_rpt.pdf.
- Parker, R. (2004, May 1). Researcher: Graduates need the skills to compete in global marketplace. *Naples Daily News*. Available at: http://www1.naplesnews.com/npdn/news/article/0,2071,NPDN_14940_2851188,00.html
- Pennsylvania Department of Education. (2004). Pennsylvania reading requirements for school, the workplace and society: Executive summary of findings. [Online]. Available: http://www.pde.beta.state.pa.us/career_edu/lib/career_edu/pennsylvania_reading_requirements_for_school_summary_reporà.pdf.
- Rosenbaum, J. E. (2004). It's time to tell the kids: If you don't do well in high school, you won't do well in college (or on the job). *American Educator*, Spring. [Online]. Available: http://www.aft.org/american_educator/spring2004/tellthekids.html.
- Sanderson, A., Dugoni, B., Rasinski, K., Taylor, J., & Carroll, C. D.. (1996). *NELS:88/94 Descriptive Summary Report With An Essay On "Access And Choice In Postsecondary Education."* Washington, DC: NCES.

- Stenner, A. J., & Burdick, D. (1997). The objective measurement of reading comprehension—In response to technical questions raised by the California Department of Education Technical Study Group. Durham, NC: MetaMetrics, Inc.
- Sum, A. (1999). *Literacy in the Labor Force: Results from the National Adult Literacy Survey*. Washington, DC: NCES.
- U.S. Department of Defense. (1982). *Profile of American Youth: 1980 Nationwide Administration of the ASVAB*. Washington, DC: U.S. Department of Defense.
- U.S. Department of Defense. (1998). *Population Representation in the Military Services*. Washington, DC: Office of the Assistant Secretary of Defense, U.S. Department of Defense. Executive Summary available at: <http://www.defenselink.mil/prhome/poprep97/index.html>.
- U.S. Department of Education. Institute of Education Sciences. National Center for Education Statistics. (2003). *The Nation's Report Card: Reading 2002*, NCES 2003-521, by W. S. Grigg, M. C. Daane, Y. Jin, & J. R. Campbell. Washington, DC: NCES.
- U.S. Department of Education. Institute of Education Sciences. National Center for Education Statistics. (2003). *The Nation's Report Card: Reading Highlights 2003*. NCES 2004-452. Washington, DC: NCES. Available online at: <http://nces.ed.gov/nationsreportcard/pdf/main2003/2004452.pdf>.
- U.S. Department of Education, National Center for Education Statistics. (2003). *Remedial Education at Degree-Granting Postsecondary Institutions in Fall 2000*, NCES 2004-010, by Basmat Parsad and Laurie Lewis. Project Officer: Bernard Greene. Washington, DC: NCES.
- U.S. Department of Education, National Center for Education Statistics. (1999). *Credit Production and Progress Toward the Bachelor's Degree: An Analysis of Postsecondary Transcripts for Beginning Students at 4-Year Institutions*, NCES 1999-179, by Alexander C. McCormick. Project Officer: Dennis Carroll. Washington DC: NCES.
- U.S. Department of Labor. (1991). *What work requires of schools: A SCANS report for America 2000*. Washington, DC: The Secretary's Commission On Achieving Necessary Skills (SCANS). Available at: <http://wdr.doleta.gov/SCANS/whatwork/whatwork.pdf>
- Venezia, A., Kirst, M. W., & Antonio, A. L. (2003). *Betraying the college dream: How disconnected K-12 and postsecondary education systems undermine student aspirations*. Stanford, CA: The Stanford Institute for Higher Education Research.
- Waters, B. K., Barnes, J. D., Foley, P., Steinhaus, S. D., & Brown, D. C. (1988). *Estimating the Reading Skills of Military Applicants: The Development of an ASVAB to RGL Conversion Table*. Alexandria, VA: Human Resources Research Organization.
- Wright, B. D., & Linacre, J. M. (1994). *The Rasch model as a foundation for the Lexile Framework*. Durham, NC: MetaMetrics, Inc.

Tables and Figures

Table I**Resources for *Student Readiness for Postsecondary Options***

Post-Secondary Options	Text Gap	Reading Ability Gap
Education	<ul style="list-style-type: none"> • MM—4000 text books (K-12) • Questia (13-14) 	<ul style="list-style-type: none"> • NAEP High School Transcript Study (HST) • High School and Beyond (HS&B) • National Longitudinal Study (NLS) • National Education Longitudinal Study (NELS) • Postsecondary Education Descriptive Analysis Reports (PEDAR) • National Assessment of Educational Progress (NAEP) • Selected NCES reports (listed below)¹ • Greene & Forster (Manhattan Institute) paper² • SCANS report³ • Rosenbaum paper⁴ • Stanford University’s Bridge Project⁵
Workplace	<p>Daggett—16 job clusters⁶ Naples Daily News quotes from Daggett (5/1/04)</p> <p style="text-align: center;">(continued)</p>	<p>1991 Assessment of the Literacy of Job Seekers¹⁴ 2003 National Assessments of Adult Literacy (NAAL)¹⁵</p>

Post-Secondary Options	Text Gap	Reading Ability Gap
Military	<ul style="list-style-type: none"> • Army post newspapers⁷ • U.S. Army Professional Writing Collection⁸ • <i>225 Years of Service</i> publication⁹ • Training and Doctrine Digital Library¹⁰ (includes field manuals and other documents) 	<i>Profile of American Youth</i> ¹⁶
Citizenship	<ul style="list-style-type: none"> • Jury instructions: <ul style="list-style-type: none"> ○ Handbook for Trial Jurors¹¹ • Voting materials: <ul style="list-style-type: none"> ○ VotersPamphlet.com¹² ○ NC State Board of Elections website¹³ (registration forms, information, etc.) • MM—38 newspapers • Eleven documents Lexiled by ICLE • Naples Daily News quotes from Daggett (5/1/04) 	2003 NAAL ¹⁵ 1992 National Adult Literacy Survey (NALS) ¹⁷ 1985 Young Adult Literacy Assessment ¹⁸

¹Selected NCES reports [bibliographic references] and (related program areas):

Knepper, P. (1990). (HS&B, HST, NLS-72)

Carroll, C. D. (1989). (HS&B)

Carroll, C. D. (1988). (HS&B)

U.S. Department of Education, National Center for Education Statistics. (1999). (HS&B, HST, PEDAR)

Horn, L. J. (1998). (HST, NELS:88, PEDAR)

Sanderson, A., Dugoni, B., Rasinski, K., Taylor, J., & Carroll, C. D. (1996). (HST, NELS:88)

²Greene, J. P. & Forster, G. (2003). Public high school graduation and college readiness rates in the United States. Education Working Paper, No. 3. Center for Civic Innovation at The Manhattan Institute.

- ³ U.S. Department of Labor. (1991). *What work requires of schools: A SCANS report for America 2000*. Washington, DC: The Secretary's Commission On Achieving Necessary Skills (SCANS).
- ⁴ Rosenbaum, J. E. (2004). It's time to tell the kids: If you don't do well in high school, you won't do well in college (or on the job). *American Educator, Spring*. [Online]. Available: http://www.aft.org/american_educator/spring2004/tellthekids.html.
- ⁵ Venezia, A., Kirst, M. W., & Antonio, A. L. (2003). *Betraying the college dream: How disconnected K-12 and postsecondary education systems undermine student aspirations*. Stanford, CA: The Stanford Institute for Higher Education Research.
- ⁶ Pennsylvania Department of Education. (2004). *Pennsylvania reading requirements for school, the workplace and society: Executive summary of findings*. [Online]. Available: http://www.pde.beta.state.pa.us/career_edu/lib/career_edu/pennsylvania_reading_requirements_for_school_summary_reporà.pdf.
- ⁷ <http://www4.army.mil/ocpa/resources/armynewspapers.html>
- ⁸ <http://www.army.mil/professionalwriting/>
- ⁹ Hogan, D. W., Jr. (2000). *225 years of service: The U.S. Army, 1775-2000*. Washington, DC: Center of Military History, U.S. Army.
- ¹⁰ <http://www.adtdl.army.mil/atdls.htm>
- ¹¹ Handbook for Trial Jurors Serving in the United States District Courts (<http://www.nysd.uscourts.gov/jurybook.htm>)
- ¹² <http://www.thevoterspamphlet.com/cgi-bin/vote.pl?command=about>
- ¹³ <http://www.sboe.state.nc.us/>
- ¹⁴ Conducted for the U.S. Department of Labor; reports by ETS; see <http://nces.ed.gov/naal/resources/resources.asp>
- ¹⁵ <http://nces.ed.gov/naal/>
- ¹⁶ Sponsored by the U.S. Department of Defense and Military Services in cooperation with the Department of Labor, see: <http://www.bls.gov/nls/nlsasv79.htm>
- ¹⁷ <http://nces.ed.gov/naal/design/about92.asp>
- ¹⁸ <http://nces.ed.gov/naal/design/about85.asp>

Table 2**Text Demand in Lexiles for Different Postsecondary Options
Selected Percentiles**

Postsecondary Activity	N	Lexile Measures Percentiles				
		5 th	25 th	50 th	75 th	95 th
Education (11-12)	23	1040	1050	1090	1120	1139
Education (13-14)	150	1124	1253	1355	1450	1580
Workplace	1401	900	1120	1260	1360	1590
Military	22	1013	1105	1180	1235	1388
Citizenship	54	1090	1193	1230	1305	1384

Figure 1

**Box Plots for Selected Text Collections That Inform
the Transition from High School to Postsecondary Experience**
(Percentiles: 5th, 25th, 50th, 75th, 95th)

