METAMETRICS RESEARCH BRIEF

Bending the Text Complexity Curve to Close the Gap

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OBJECTIVE

Prior research has identified a gap between the reading demands of high school and those of postsecondary endeavors (Williamson, 2008). When considered in the context of the K-12 text continuum (Koons & Williamson, 2012), this implies that a different text complexity trajectory is needed to close the gap that characterizes the present text complexity continuum in relation to postsecondary text demands. What should this new "aspirational" or "stretch" text complexity trajectory look like? Two questions are relevant to reducing the high school/postsecondary text complexity gap:

1. How should the gap in text complexity be apportioned across the K–12 continuum?; and
2. What policy actions could be taken to affect gap closure?

The objective of this research bulletin is to present a "stretch" text complexity trajectory that aligns with postsecondary text demands.

Key Hypotheses:

The current K-12 text complexity trajectory can be mathematically altered to eliminate the gap in text demands between high school and postsecondary reading materials.

METHODS

Participants (Units of Analysis)*:*

The units of analysis for this study are the medians from current grade-specific text complexity distributions in grades 1-12 (Koons and Aguirre, 2008; Koons & Williamson, 2012).

Procedure:

First, we fit a polynomial curve to the text complexity medians for grades 1-12 (Koons & Williamson, 2012). In essence, we treated each grade-level median as an observed measure that is comprised of a "true" value, plus error of measurement. The "true" or latent curve is our interest, not a choppy connection of the observed data points (i.e., medians) for each grade. This analysis produced the bottom curve in Figure 1. This is the latent text demand curve that describes how text currently changes throughout the K–12 continuum.

Second, we wanted to construct an "aspirational" text demand curve that would describe how text complexity exposure *could* be modified to realize a smoother transition from K–12 to college and career. Based on research summarized by Stenner, Sanford-Moore and Williamson (2012), we start by setting the end point for the aspirational curve to 1300L to align with college and career text demands. However, the construction of the curve must rely on some strategy for deciding how the increased text demand of postsecondary reading materials (approximately 170L above eleventh and twelfth grade texts) should be distributed across the public school grades.

There are many apportionment strategies that could be used and some could be highly disruptive to the educational system. For example, slower text demand growth in grades 9–12 might be cited to rationalize an apportionment strategy that distributes the increased text demand across the high school grades and leaves the text demands unchanged in K–8. High school teachers might have great concerns with this strategy. Similarly, apportioning the entire gap to the primary grades under the rationale that this is the grade band that shows the highest text trajectory growth could disrupt K–3 instruction. These strategies are akin to balloon mortgages or fixed mortgages, respectively, in the mortgage industry. The "balloon" model places increased financial demand on the individual in the last few years of the loan, whereas the "fixed" mortgage establishes the increased financial demand at the beginning of the loan.

MetaMetrics felt that both the "fixed" model and the "balloon" model could be fairly disruptive to the educational system. Consequently, we adopted a third model, which proportionally distributes the reading gap over the developmental continuum of reading in Grades 1-12. Said differently, the reading gap is distributed proportionally across the grades based on how text is currently apportioned. The goal of the apportionment strategy is to eliminate the text gap during one seven-to-eight year textbook-adoption cycle. We believe this may be feasible because the gap appears to have been created in a short time period in the early 1960s (Chall, Conrad, and Harris, 1977; Hayes, Wolfer, and Wolfe, 1996).

Speaking concretely, the compromise strategy distributes the 170L gap proportionally across grades in the same manner that the current text demand trajectory distributes the current grade-to-grade increases in text demand. Thus, if 18% of the current text demand curve can be attributed to 3rd grade and 5% to 10th grade, then 18% of the 170L gap (31L) would be allocated to 3rd grade and 5% of the gap (9L) would be allocated to 10th grade. This strategy produces the "stretch" trajectory in Figure 1. The detailed analytical strategy is summarized in the **Analyses** section.

Measures:

Lexile® measures (Stenner, Burdick, Sanford & Burdick, 2007) are measures of reader ability and text complexity that are based on semantic and syntactic factors and are reported on a developmental scale. Independent psychometric studies of the Lexile scale (Mesmer, 2007; White & Clement, 2001) indicate that it is a valid and reliable measure of reader ability and text complexity.

A Lexile measure is the numeric representation of an individual's reading ability or a text's complexity (or, difficulty), followed by an "L" (for Lexile). The Lexile scale ranges from 0L and below for emerging readers and beginning texts to above 1600L for advanced readers and texts. Values at or below 0L are reported as "Beginning Reader" (BR).

Extensive information about the development of the Lexile Framework for Reading can be found in the "Research" section of the Lexile website (www.Lexile.com).

ANALYSES

The following steps describe how MetaMetrics developed the "stretch" ranges associated with each grade level using a proportional apportionment model based on the current text demand ranges at each grade level (see the specific ranges associated with each grade level at http://www.lexile.com/about-lexile/grade-equivalent/grade-equivalent-chart/).

1. Conducted a textbook reading demand study by examining textbooks that were: (1) in state adoptions and (2) complete series. Each grade level sample (Grades 1-12) consisted of approximately 41 textbooks on average (range was 27 to 61) selected from reading, ELA, health, mathematics, science, and social studies. See Koons and Williamson (2012) for a summary of this research.
2. Conducted postsecondary reading demand studies and aggregated across the domains of postsecondary education (i.e., 4-year university, community college, and technical school), work place, military, domestic citizenship, international newspapers and Wikipedia "featured" articles. The median text complexity measure in the pooled postsecondary reading materials (i.e., 1300L) was taken to define college and career readiness (CCR). See Stenner, Sanford-Moore and Williamson (2012) for details of this research.
3. Determined the median text complexity measure for the text complexity distributions at each grade level. This curve across Grades 1-12 was smoothed using ordinary least squares regression. The resulting fitted curve defines the "current" value of the latent text complexity trajectory at each grade.
4. Calculated the growth from one grade to the next. So, for example, the growth from Grade 1 to Grade 2 was 206L and the growth from Grade 10 to Grade 11 was 41L.
5. Calculated the overall growth from Grade 1 to Grade 12 (1134L – 313L = 821L).
6. Calculated the proportion of the overall growth associated with each grade. So, the growth from the end of Grade 1 to the end of Grade 2 is 206L and this is 25% of the overall growth (206L/821L) and the growth from the end of Grade 10 to the end of Grade 11 is 41L and this is 5% of the overall growth (41L/821L).
7. Calculated the growth from Grade 1 to Grade 12 needed to be CCR (1300L – 313L = 987L).
8. Calculated the new growth needed in each grade level to be CCR at the end of Grade 12 using the same proportion of total growth that characterizes the current text complexity curve. So, the proportion of growth from the end of Grade 1 to the end of Grade 2 was 25% and 25% of 987L is 248L; and, the proportion of growth from the end of Grade 10 to the end of Grade 11 was 5% and 5% of 987L is 49L.
9. Calculated the increase per grade level in growth between the current model and the aspirational model. So, for the Grades 1-2 growth this is 42L (248L – 206L) and for Grades 10-11 growth this is 8L (49L – 41L).
10. These new growth estimates from grade to grade were then used to construct the "stretch" line. So, Grade 2 became 560L (313L + 205L + 42L) and Grade 11 became 1258L (1099L + 41L + 8L).

This methodology takes into account both the actual Lexile measure and the amount of growth from one grade to the next.

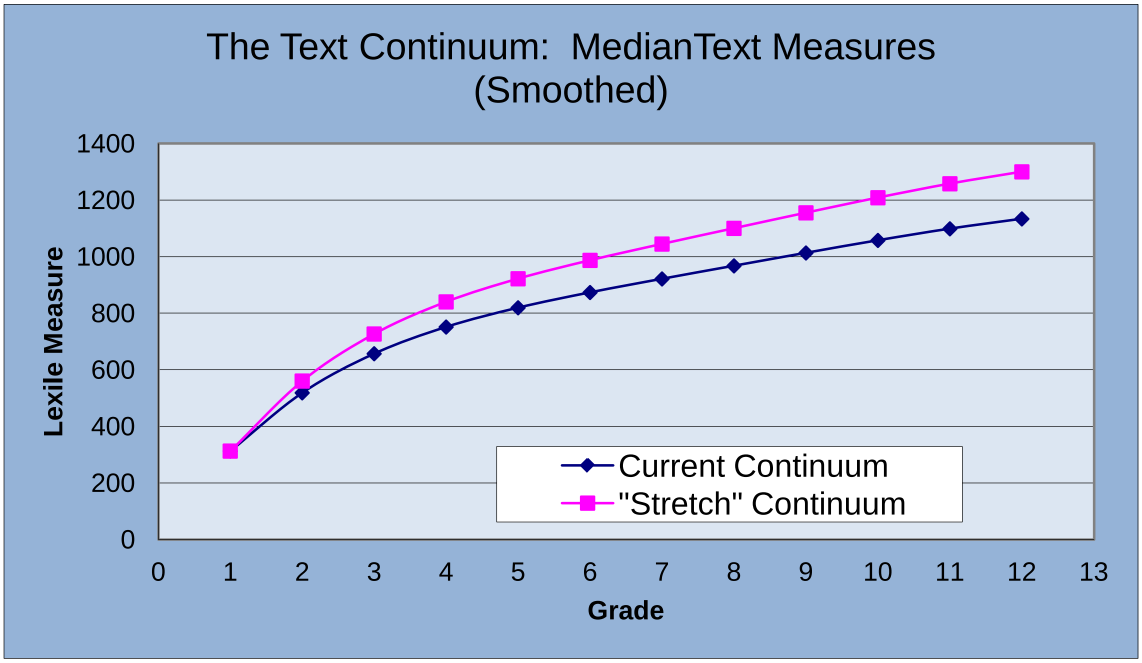
RESULTS & DISCUSSION

The results are shown in Figure 1. The new aspirational or "stretch" text complexity trajectory is shown along with the original text complexity curve for comparison. Note that both curves start at the same point in first grade, thus leaving the current text demands in first grade unchanged. However, the "stretch" curve rises faster across the subsequent grades in order to reach 1300L by the end of twelfth grade. The two curves have similar shapes because of the proportional allocation strategy imposed on the "stretch" curve relative to the current text complexity curve.

The policy actions needed to effect such a text gap closure might include: 1) federal incentives similar to those being offered to states for adopting the Common Core State Standards; 2) state education agencies agreeing to the new text demand curve and building the curve into textbook adoption calls; and 3) working with publishers to gain buy-in from textbook author teams. Educators, particularly teachers and principals, would need to use the "stretch" trajectory to regulate the increased text complexity exposure in their instructional program.

As we have mentioned, there are many alternate pathways to CCR through increased text complexity exposure. Williamson, Fitzgerald and Stenner (2012) illustrate a parametric strategy for constructing alternatives and discuss the educational implications associated with increasing text complexity exposure.

Figure 1.



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