



# The Spanish Text Complexity Continuum in Grades 1-12

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## OBJECTIVE

In 2018, MetaMetrics® conducted a study to examine the Spanish reading demands of materials encountered by Grades 1-5 students in the United States during their daily instruction (Sanford-Moore, Aguirre, Stenner, Redman, Calderon, Weller and Kiehm). The results showed that median text difficulty as measured by the **Spanish Lexile® Text Analyzer** increased across Grades 1-5 and that there was considerable variability in Spanish text complexity within grade.

The objective of this current research was to expand on the research conducted into the reading demands of Grades 1-5 to depict the grade-level Spanish text complexity distributions for Grades 1-12 in the U.S. This effectively documents a systematic continuum of Spanish text complexity exposure for reading education.

### Key Hypotheses:

1. Median Spanish text complexity generally increases with grade; and
2. Spanish text complexity varies within grade.

## METHODS

### Participants (Units of Analysis):

The units of analysis were Spanish textbooks used in the public schools in Grades 1-12.

### Procedure:

MetaMetrics systematically collects commonly used texts and measures their text complexity using the **Lexile® Framework for Reading** and the **Lexile® Text Analyzer** for English texts and **El Sistema Lexile® para Leer** and the Spanish Lexile Text Analyzer for Spanish texts. The resulting Spanish Lexile® measures of text complexity were statistically summarized by grade.

Research to examine the text complexity of English texts was initially conducted in 2004 with high school Grades 11-12 and then expanded in 2008. MetaMetrics embarked on a series of studies to update the description of the text complexity continuum for all of the public school grades. These studies were implemented in stages: the high school (Grades 9-12) in Fall 2005; the middle school (Grades 6-8) in Spring 2007; and the elementary school (Grades 1-5) in Spring 2008. The result was the publication of a Research Brief entitled “The Text Complexity Continuum in Grades 1-12” (Williamson, Koons, Sandvik and Sanford-Moore, 2012).

Following the same processes and procedures as used with the English text continuum study, the Spanish work initially began in 2017 and utilized the extant **Lexile® Titles Database** that MetaMetrics had established and maintained since its inception. MetaMetrics identified Spanish texts by consulting textbook adoption lists from a sample of states where statewide textbook adoptions were common practice (e.g., California, Florida, New Mexico and Texas). We focused on student editions of Spanish textbooks, organized into four content categories: Spanish Language Arts, Mathematics, Science and Social Studies. Textbooks that appeared on adoption lists in multiple states were selected for possible inclusion in the study. The assumption guiding this process was that textbooks selected for adoption in multiple states were likely to be used by a large number of students. When the textbooks occurred in a series, all books in the series were included in the study.

The updated lists of Spanish textbooks were compared with the titles in the existing MetaMetrics database to identify texts that had already been measured and those that would need to be measured for Spanish text complexity. Previously unmeasured texts were purchased and Spanish Lexile text measures assigned. Where possible, texts designated for a single grade were included in the analyses so as to unequivocally characterize within-grade text complexity distributions. Given the limited number of Spanish textbooks available and the general lack of a grade-specific designation for Grades 7 through 12, the grade-specific samples were combined into a middle school sample (Grades 7 and 8) and a high school sample (Grades 9 through 12). The resulting sample sizes are shown in Table 1. A total of 163 textbooks in Grades 1 through 12 were included in the study (92.6% of the copyrights were 2011 or later; and 7.4% of the copyrights were 2008-2010).

### Measures:

Spanish Lexile measures (MetaMetrics, 2013) are measures of Spanish reader ability and Spanish text complexity that are based on semantic and syntactic factors and are reported on a developmental scale. Linking studies utilizing the Spanish Lexile scale (MetaMetrics, 2013) indicate that it is a valid and reliable measure of Spanish reader ability and Spanish text complexity.

A Spanish Lexile measure is the numeric representation of an individual’s Spanish reading ability or a Spanish text’s complexity (or, difficulty), followed by an “L” (for Lexile measure). The Spanish Lexile scale ranges from 0L and below for beginning readers and beginning texts to above 2000L for advanced readers and texts. Values at or below 0L are reported as “Beginning Reader” (BR).

## ANALYSES

Each grade-level or grade-grouping Spanish text collection was analyzed separately. Selected percentiles (5<sup>th</sup>, 25<sup>th</sup>, 50<sup>th</sup>, 75<sup>th</sup>, 95<sup>th</sup>) of the Spanish text complexity distributions were calculated (e.g., with SAS PROC UNIVARIATE). These were used to construct modified box-and-whisker plots for the grade-level distributions of Spanish text complexity. The box-and-whisker plots were displayed graphically in grade-level order.

## RESULTS &amp; DISCUSSION

Sample sizes for the grade-level Spanish text collections are shown in Table 1. The median Spanish Lexile text measures are shown by grade in Table 2, along with the 25<sup>th</sup> percentile and 75<sup>th</sup> percentile (boundaries for the interquartile range). The Spanish text distributions are graphically displayed in Figure 1. Table 2 and Figure 1 confirm the two fundamental hypotheses.

First, median text complexity generally increases with grade. Because these samples are not probability samples, a statistical test for the difference is not appropriate, strictly speaking. Furthermore, we can see from Table 2 that median text complexity increases more or less smoothly where it is about 90L difference between Grades 1 through 3 and then to about 50L difference between Grades 3 through 5. When Grades 6 through 12 are examined, we can see that median text complexity also increases more or less smoothly across the grade groupings. Given the relatively small sample sizes, some departure from strict monotonicity might be expected. The fact that there is so little departure supports our first hypothesis: namely, that text complexity generally increases across Grades 1-12.

Secondly, we infer from the box-and-whiskers in Figure 1 that the second hypothesis for text complexity is also supported. Text complexity clearly varies within grade. The IQR ranges from 90L (Grade 1) to 200L (Grades 7-8). [This is easily confirmed from Table 2.] Judging from the whiskers compared to the box (IQR) in Figure 2, within-grade variability appears to be smallest in Grade 2 and Grades 9-12. Generally, the IQR is about 100L to 150L with slightly higher measures in Grade 6 and Grades 7-8. This larger IQR may relate to the sample of textbooks that was selected and/or differences in instructional opportunities available in Spanish at these grade levels.

This study provides educators a clear picture of current text complexity demands associated with each of the Grades 1-6 and the grade-groupings in Grades 7-12. Even though the sample sizes appear to be modest, they in fact may represent a large proportion of the textbooks used in Grades 1-12 Spanish-language instruction because there are relatively few textbook publishers and states have limited options for textbook adoption.

Clearly, our understanding of text demands in the public schools is an evolving one. Schools have the option of supplementing regular textbooks and both texts and auxiliary reading materials can change over time. Consequently, MetaMetrics continues its study of text complexity and updates its Titles Database to ensure adequate coverage. This in turn supports the validity of inferences about text demand from studies such as these.

We limited this study to textbooks that were designated for use in one particular grade or in one particular grade grouping at the secondary level. Of course, this decision served to reduce potential sample sizes; but it facilitated our ability to more finely ascribe text complexity exposure to a particular grade-grouping of students. Including textbooks that are designed for a sequence of grades would increase sample size, but would also tend to homogenize the grade-level text distributions and could cause us to infer less increase in text complexity across grades. In addition, it would introduce statistical dependency between the grade-level text distributions.

Studies of text complexity will no doubt continue. Textbooks evolve. Also, alternative sources of text (e.g., online sources) continue to emerge and have just begun to be studied. There is still ample opportunity to enhance our understanding about text complexity and to explore how and when readers encounter new or different text demands.

**Table 1. Final Sample Sizes for Spanish Text Study**

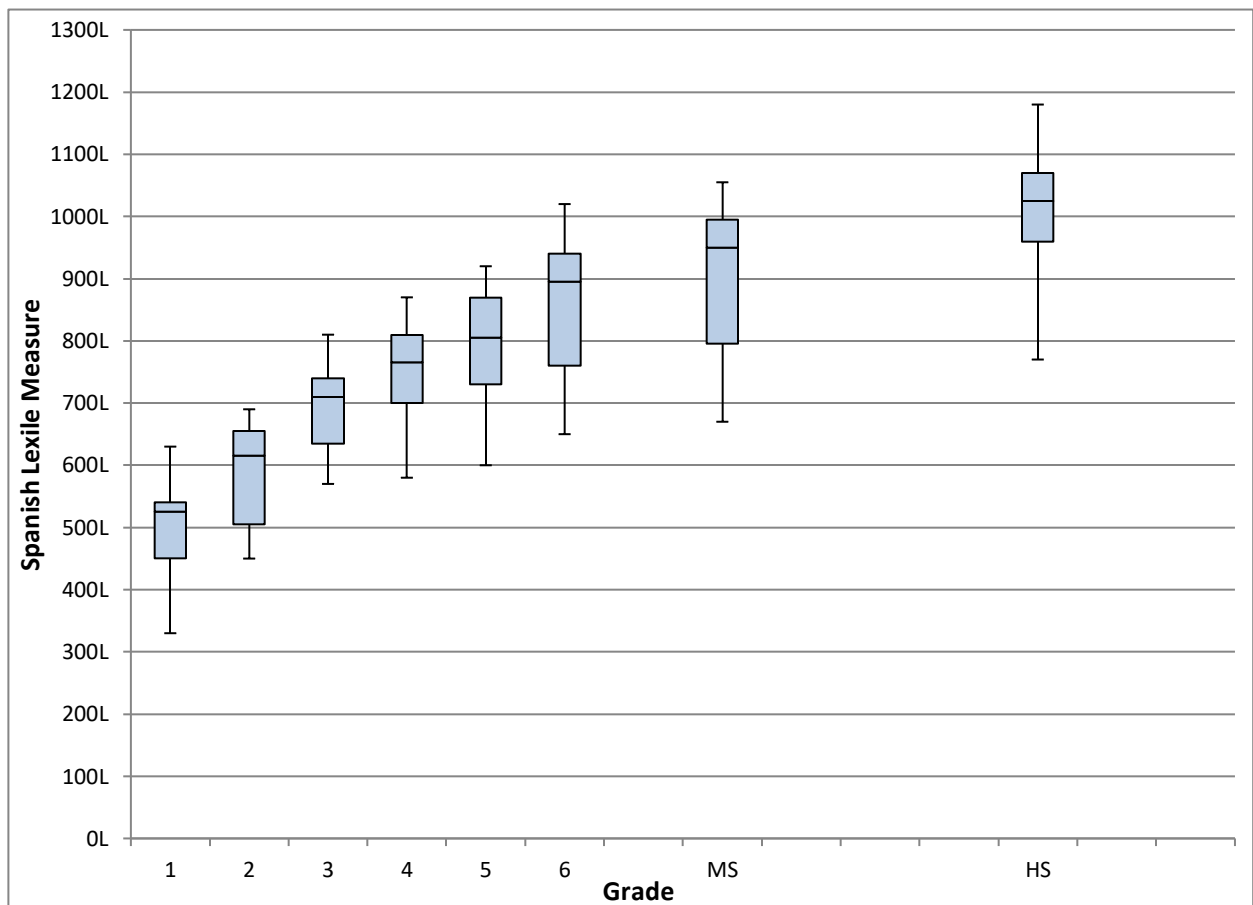
Primary School	Middle/High School
Grade 1 ( <i>n</i> = 16)	Grade 6 ( <i>n</i> = 17)
Grade 2 ( <i>n</i> = 16)	Grades 7-8 ( <i>n</i> = 17)
Grade 3 ( <i>n</i> = 16)	Grades 9-12 ( <i>n</i> = 32)
Grade 4 ( <i>n</i> = 16)	
Grade 5 ( <i>n</i> = 16)	

**Table 2. Median Spanish Text Complexity Measures and Interquartile Range Boundaries by Grade**

Grade	25th %ile	Median	75th %ile
1	450L	525L	540L
2	505L	615L	655L
3	635L	710L	740L
4	700L	765L	810L
5	730L	805L	870L
6	760L	895L	940L
7-8	795L	950L	995L
9-12	960L	1025L	1070L

Note: Measures rounded to nearest 5L

**Figure 1. Spanish Text Complexity Distributions by Grade  
(Whiskers represent 5<sup>th</sup> and 95<sup>th</sup> Percentiles)**



REFERENCES

MetaMetrics. (2013). *El Sistema Lexile® para Leer: Research and development*. Durham, NC: MetaMetrics, Inc.

Sanford-Moore, E.E., Aguirre, A., Stenner IV, A.J., Redman, C., Calderon, D., Weller, E., & Kiehm, A. (2018). *The Spanish text complexity continuum in grades 1-5*. Durham, NC: MetaMetrics, Inc.

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