Complexity of University Texts in the United Kingdom

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OBJECTIVE

The two objectives of this research were:
- to quantify the complexity of textbooks commonly used in universities in the United Kingdom (UK); and,
- to compare the text complexity of UK university texts with texts used in the United States of America (USA) by postsecondary educational institutions (universities, community colleges and technical colleges).

Key Hypotheses:
1. The median text complexity of texts used in universities of the United Kingdom is similar to the median text complexity of texts used in postsecondary education in the United States of America.
2. The distributions of text complexity are similar for university texts in the United Kingdom and the United States of America.

METHODS

Participants:
The units of analysis were textbooks used in selected universities of the United Kingdom. A two-stage process was used to identify texts for inclusion in the study. During the first stage of the selection process, prospective universities were identified for inclusion in the study based on rankings provided by *The Complete University Guide* (CUG) (University League Table, 2015). The CUG ranking system is based on entry standards, student satisfaction, research assessment and graduate prospects. We focused on those UK universities that were ranked in the Top 50. Then as a practical condition for inclusion in the study, we required that universities should have open access to reading lists, university bookshops, or course syllabi. We selected ten universities which met these conditions.

In the second stage, we selected specific texts by searching university libraries and bookstores for introductory course syllabi (Semester 1). Classes in the UK are referred to as modules, and many universities provide course information in searchable module indexes (e.g., Knox, 2015). In some cases, some modules were not updated for the current semester, so we relied on university bookstores for required texts (e.g., Smith, 2015). We endeavored to balance the selected texts across Science, Business and English disciplines, and always checked to verify whether a title used at one university was also used at another.

The ten universities selected for inclusion in the study are listed in Table 1. As it turned out, these universities are in fact among the top thirty UK universities in the 2015 CUG rankings. Table 1 also presents the number of texts selected from each university. A total of 99 textbook titles were selected from the ten universities. A number of texts were used at multiple universities; however, texts were only counted once for analysis purposes. Among the 99 texts, there were 70 unique titles which comprised the data set for this study

To expedite text measurement once texts were selected for inclusion in the study, we sampled portions of each text for measurement. Rather than measuring the entire text, we selected three chapters from each book—one chapter from the beginning of the book (but never including the first chapter), one chapter from the middle of each book and one chapter near the end of each book. The three chapters were pooled to form a representative sample of reading material to characterize the text complexity of the entire book.

Procedure:
MetaMetrics measured the text complexity of each textbook sample using The Lexile® Framework for Reading and the Lexile® Analyzer. The resulting Lexile measures of text complexity were statistically summarized for the 70 UK university texts. In the Results and Discussion section, we observe the characteristics of the UK university text collection relative to text collections from universities in the USA, as well as for texts more generally used in postsecondary education in the USA by universities, community colleges and technical colleges.

Measures:
The Lexile® Framework is a scientific way to match readers with text using the same developmental scale. Lexile® text measures (Stenner, H. Burdick, Sanford & D.S. Burdick, 2007) are measures of text complexity that are based on semantic and syntactic factors. Independent psychometric studies of the Lexile scale indicate that it is a valid and reliable measure of reader ability and text complexity (Mesmer, 2008; White & Clement, 2001).

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 is a developmental scale for measuring reader ability and text complexity, ranging from below 0L for beginning readers and beginning reader materials to above 2000L for advanced readers and materials.

Extensive information about the development of the Lexile Framework for Reading can be found in the "Research and Publications" section of the Lexile website (www.Lexile.com/research-and-publications).

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ANALYSES

Using SAS PROC UNIVARIATE, we calculated sufficient statistics for the Lexile measures of UK university texts. In addition, selected percentiles of the distribution of text complexity measures provide the basis for constructing a modified box-and-whiskers plot featuring the 95th, 75th, 50th, 25th and 5th percentiles of the UK text complexity distribution. Corresponding statistics for the USA text collections were available from previous work (Williamson, 2012).

RESULTS & DISCUSSION

The average Lexile measure for UK university texts was 1280L and the standard deviation of the distribution was 114L. In Table 2, we summarize selected percentiles of the distribution of UK university text complexity measures and the distributions of analogous text collections assembled from postsecondary institutions in the USA. Figure 1 affords a visual representation.

The university text distributions for the UK and the USA are very similar. The observed differences are too small to be educationally important in most cases. For example, the corresponding percentiles of the UK and USA university text collections are within 30L of each other except for the 95th percentile, where the difference is 80L. This larger difference at the upper extreme of the distributions can be partly due to the difference in sample sizes between the two text collections (the USA text collection being larger).

Understandably, there are larger differences between the UK university text collection and the broader postsecondary text collection from the USA because the latter represents community college and technical college texts in addition to university texts. Even so, the difference between the medians is just 40L and the boundaries of the interquartile ranges are quite close to each other (within 30L). The slightly larger spread between the 5th and 95th percentiles of the USA postsecondary text collection (450L) versus the corresponding spread for the UK university text collection (400L) is also probably due to the sample sizes of the different text collections.

Naturally in Figure 1, the visual impression is one of striking similarity between the text complexity distributions of university texts in the UK and the USA.

The research hypotheses for this study are retained. Nevertheless, the results of any text study depend on the particular collections of texts analyzed. These in turn are always restricted by availability and resources to gather and measure the requisite text samples. As work in this area continues, findings will build upon the provisional baseline established by this study.

**Table 1**
Number of Texts Selected for Study, by University

University	Number of Texts
Durham University	9
Newcastle University	10
The University of Warwick	10
University of Bath	10
University of Birmingham	10
University of Glasgow	10
University of Leeds	10
University of Southampton	10
University of St. Andrews	10
University of Surrey	10
Total	99

Table 2
Selected Percentiles for Postsecondary Text Distributions

	USA Postsecondary Education	USA University	UK University
95th Percentile	1490L	1540L	1460L
75th Percentile	1350L	1390L	1360L
Median	1270L	1300L	1310L
25th Percentile	1180L	1220L	1210L
5th Percentile	1040L	1080L	1060L
n	536	294	70

Figure 1. **Text Complexity Distributions for University Texts in the United Kingdom Relative to Postsecondary Text Distributions in the United States of America (Box-and-Whiskers Plots Display 5th, 25th, 50th, 75th and 95th Percentiles)**
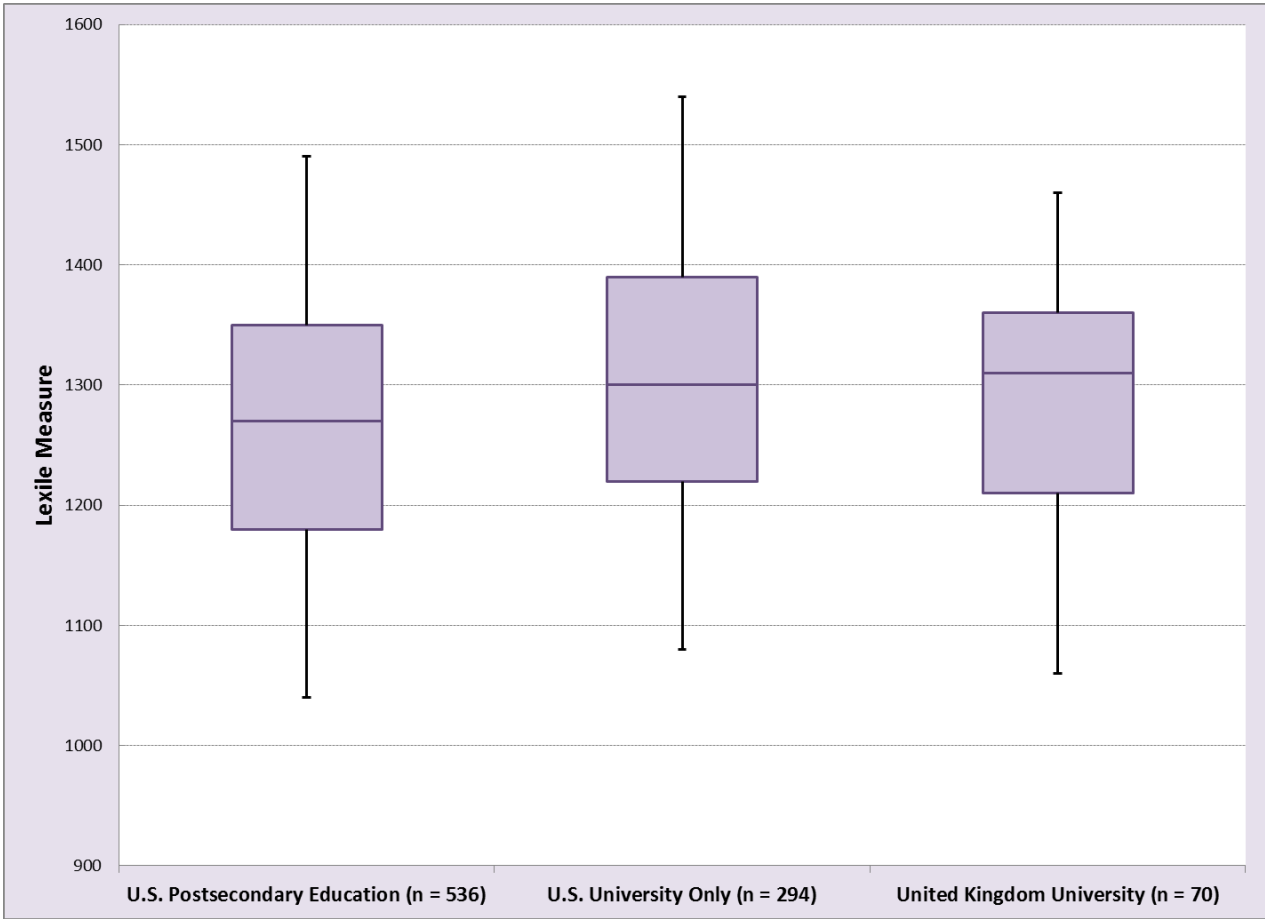
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