METAMETRICS RESEARCH BRIEF

Enriching the Concept of Career Preparedness by Examining Text Complexity Associated with Bright Outlook Occupations

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OBJECTIVE

Text complexity associated with college and career preparedness has become an issue of national interest (NGA & CCSSO, 2010). Previous work (e.g., Daggett, 2003; Stenner, Sanford-Moore & Williamson, 2012; Williamson, 2008) has examined workplace texts globally or within the United States Department of Education (USED) career clusters but has not reported on texts associated with specific individual occupations. This study provides a description of the text complexity of reading materials that are considered important for accessing specific individual occupations.

The focal occupations for this study are the O*NET Bright Outlook Occupations identified on the O*NET website (http://www.onetonline.org/find/career) in December 2012. Bright Outlook Occupations are expected to grow rapidly in the next several years, will have large numbers of job openings, or are new and emerging. Occupations are designated as Bright Outlook Occupations by the National Center for O*NET Development using data collected by the U.S. Bureau of Labor Statistics. A linear systematic sample (described below) of the December 2012 Bright Outlook Occupations was selected for data collection and analysis. The focus of the study is on identifying the reading ability necessary for career *preparedness* or career *accessibility*. Career success is not a criterion outcome for the study.

Key Hypotheses: The study provides descriptive results only.

METHODS

Participants*:* The "participants" of this study are text samples associated with specific occupations. The focus of the study is on identifying the reading ability necessary for career *preparedness* or career *accessibility*. Therefore, admissible materials had to satisfy the following requirements.

- Texts that are commonly encountered and/or used by individuals who are being trained for a selected career or are in their first year of employment in the career. For example, texts may include (but are not limited to) the following:
  - Texts associated with degree or certification programs required for career entry.
  - Texts commonly used or disseminated by professional organizations associated with the career.
  - Texts posted on websites of career-related professional organizations.
  - Recruitment materials associated with the career.
  - Commonly used reading materials, manuals, or references associated with on-the-job performance during the first year of employment in the career.
- Texts that predominantly consist of professionally edited prose.
- Texts that are readily available in print or editable electronic format.
- Texts that are classifiable as to source, purpose and/or use.

Based on projected workload considerations, ten text samples were sought to represent each individual career.

Career Sample Design

There were 354 O*NET Bright Outlook Occupations as of December 2012. Approximately 50 occupations were desired for study in a first phase to be completed during 2013. The remaining Bright Outlook Occupations will be held for future phases of work. Coincidentally, the factorization of $N = 354 = 2 \times 3 \times 59 = 6 \times 59$ suggested a sample size of 59 occupations, which could be achieved with a sampling interval of 6 (sampling fraction equal to 1/6). With a sampling interval of 6, there are exactly six systematic samples possible from the population of Bright Outlook Occupations. Choosing a random number between 1 and 6, inclusive, is sufficient to randomly select a linear systematic sample for study. Once a random start is chosen, the sample of careers is established. (This also reserves five equivalent alternate samples for future implementation when desired.) The sampling frame was ordered by Standard Occupational Classification (SOC) code within career cluster, ensuring that the proportion of careers in each cluster in the sample is approximately equal to the proportion of careers in each of the career clusters represented in the Bright Outlook population of careers.

The major challenge of the study was locating sufficient numbers of reading materials for each sampled career. Unfortunately, no sampling frame exists for career-related texts. Consequently, reading materials cannot be probabilistically selected. Reading materials were chosen based on availability and the degree to which they satisfied the desired text requirements outlined above.

Procedure:

The ongoing work was organized into six phases that correspond to six mutually exclusive, but exhaustive, systematic samples of the Bright Outlook Occupations as identified in December 2012. By using this strategy, in conjunction with a random selection of which systematic sample to use in each phase, the long-term study is assured of successive and cumulative representative random samples of Bright Outlook Occupations at the completion of each phase of analysis. In addition, there will eventually be an exhaustive analysis of all O*NET Bright Outlook Occupations (as of December 2012) when all six phases have been completed. The growing data base affords the opportunity of

continuously expanding coverage of the Bright Outlook Occupation population, while maintaining representativeness of the Bright Outlook population and the constituent USED career clusters during each phase of study.

For the first phase, summarized in this research brief, materials were identified from extant sources (e.g., career preparation institutions, professional associations, career-related websites, etc.). Each text sample was digitized and measured for text complexity using the Lexile® Analyzer and standard protocols for preparing documents to be measured. It proved impossible to obtain reading samples for some careers (notably those that only required a high school education for entry) because there were no professional associations or postsecondary institutions responsible for preparing potential career candidates. Consequently, the text complexity measures of high school texts (Williamson, 2008) were used as a proxy for the career reading requirements in those instances where a high school diploma was the entry requirement for the career.

Measures:
The primary measure used for analysis is the Lexile measure (Stenner, H. Burdick, Sanford & D. S. Burdick, 2007). Lexile® measures 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.

Other variables collected for the study included: the Standard Occupational Classification (SOC) code for the career, career title, years of required education to enter the career, U.S. Department of Education (USED) career cluster; and variables associated with the specific text sample (e.g., source, cost, etc.).

ANALYSES

Selected percentiles were calculated for the distribution of Lexile measures associated with each career text collection. The median (50th percentile) Lexile measure indicates the typical text complexity of each career text collection. The 25th percentile and 75th percentile were used to depict the interquartile range of text complexity for each career text collection. A bivariate plot of median career text complexity measures versus years of education required for career entry is also presented for the 59 Bright Outlook Occupations.

RESULTS & DISCUSSION

The results are presented graphically. In Figure 1, careers are displayed in order of increasing median text complexity. Selected careers are labeled with the career name to provide anchors for interpreting the career text continuum. Several features of the plot are notable. First, each career (with one exception) is represent by a bar, representing the interquartile range of text complexity measures associated with the career. The lower end of the bar corresponds to the 25th percentile of the career text complexity distribution. The upper end of the bar corresponds to the 75th percentile of the career text complexity distribution. Consequently, the entire bar represents the interquartile range (middle 50%) of text complexity measures associated with the career. The mid-point line in each bar denotes the median career text complexity. The one exception to this convention is the fifth career from the top of the plot. For that career, there was insufficient information to determine an interquartile range; consequently, only the median text measure is plotted for that one career.

Seventeen of the 59 Bright Outlook Occupations required only a high school diploma for career entry. As mentioned earlier, the high school text collection reported by Williamson (2008) provides a proxy median and interquartile range for these careers, which are represented by the yellow bars at the bottom of the plot. Because the high school texts are generally serving as proxy texts for these careers, the yellow bars (except one) are identical. The one exception is due to the fact that a sample text was available for one high school career; in that case, the text was pooled with the high school texts to determine the text distribution for the career.

In Figure 2, the same 59 Bright Outlook Occupations are displayed in another fashion. The median text complexity of each career is plotted versus the number of years of education required for entry into the career. The same anchor careers that were labeled in Figure 1 are also identified in Figure 2. As expected, there appears to be a positive relation between the number of years of education required and the text complexity associated with career entry.

In Figure 3, the Bright Outlook Occupations are grouped into the sixteen USED career clusters. For each career cluster, the median and inter-quartile range are depicted in the chart. The cluster names appear in the vertical axis labels.

This study provides perhaps the first glimpse of text complexity for individual Bright Outlook Occupations and summarizes those findings by career cluster and for all 59 occupations combined. It is worth noting that the median text complexity measure of all texts examined for the Bright Outlook Occupations is 1140L. This is 120L lower than the median text measure (1260L) reported by Williamson (2008) for workplace texts. The middle 50% of the Bright Outlook Occupation texts range from 1090L to 1270L. Williamson reported an inter-quartile range for workplace texts that ranged from 1120L to 1360L. It is difficult to know whether these differences are important due to the differences in sample size and different purposes of the two text collections. The Bright Outlook Occupations comprise a narrower sub-domain within the broad universe of workplace texts. Also, 17 (28.8%) of the 59 Bright Outlook Occupations in the linear systematic sample examined for this study required only a high school diploma for career entry. High school text difficulty measures were used as proxies for career text difficulty in

those careers requiring only a high school diploma; this procedure could have contributed to the lower levels of text in the Bright Outlook sample. At the same time it is worth noting that a number of individual careers and career clusters have higher text complexity measures than those reported for workplace texts by Williamson (2008).

The current work is deliberately limited to an examination of texts associated with Bright Outlook Occupations, which may differ from workplace texts in general. In addition, Bright Outlook Occupations are not uniformly distributed across the 16 USED career clusters—i.e., some clusters have more Bright Outlook Occupations than other clusters. Therefore, generalizations to particular career clusters should be made cautiously.

The most notable limitations of the present study are the small sample sizes and lack of probability sampling. The numbers of texts per career ranged from 1 to 11, with most careers being represented by somewhere between 5 and 11 text samples. Thus career text measures should be regarded as approximate. As subsequent phases of the study are completed, the numbers of texts within career clusters and the total sample of Bright Outlook Occupations will accumulate. The number of sampled careers will approach the entire population of Bright Outlook Occupations by the completion of the final phase.

Unfortunately, scientific sampling strategies are not possible because there is no sampling frame for workplace texts. The representativeness of the career text samples relies on availability and human judgment with respect to how closely potential texts align with the text characteristics prescribed by the study design (described earlier). Nevertheless, the results presented in this research brief provide a start and gives some information where none was available before. Continued work in the measurement of career text complexity should make it possible to build on this beginning to improve our understanding in the future.

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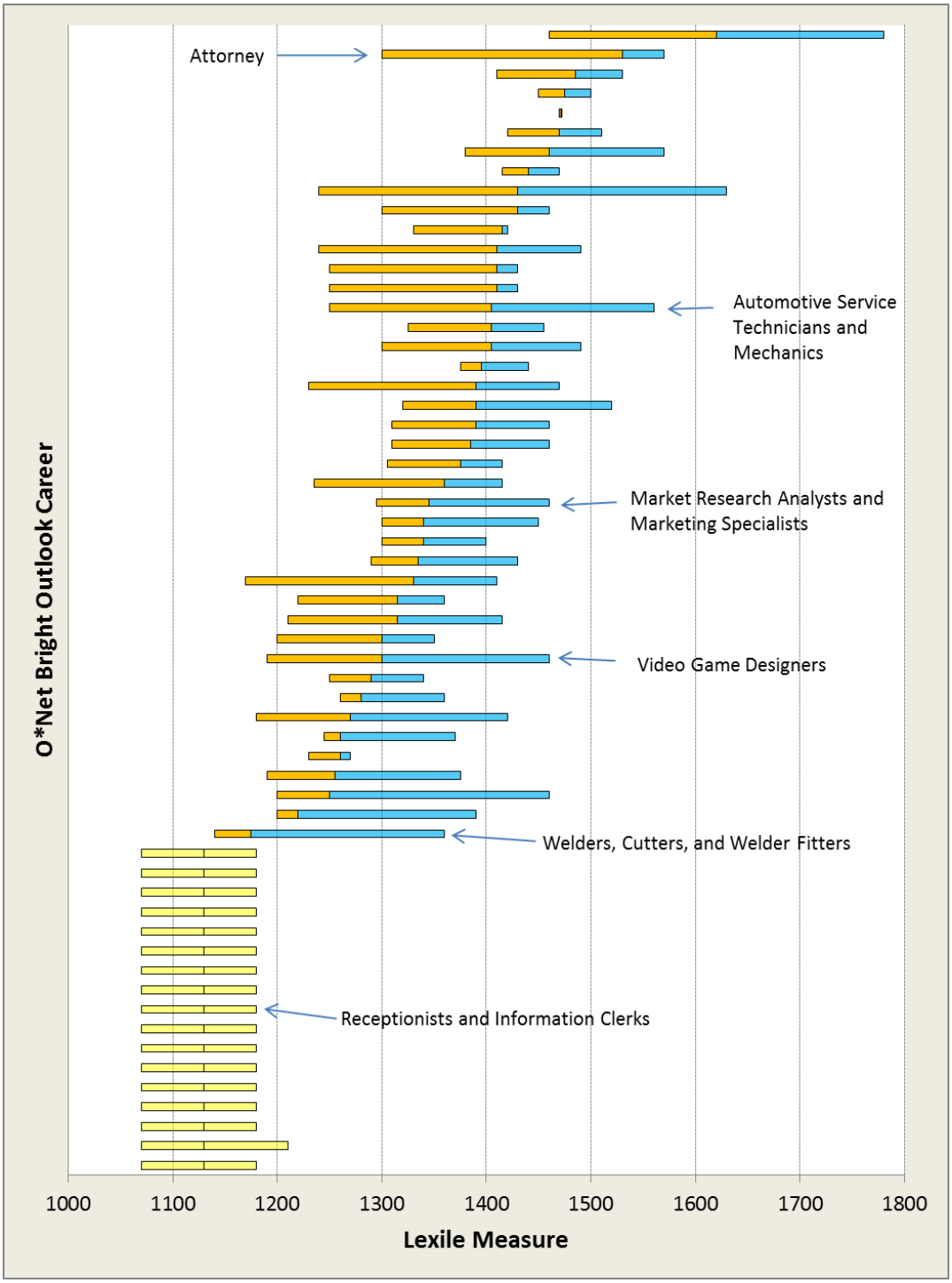

Figure 1. Text complexity for O*NET Bright Outlook Occupations: Medians and inter-quartile ranges for Phase 1 linear systematic sample (n = 59 careers).

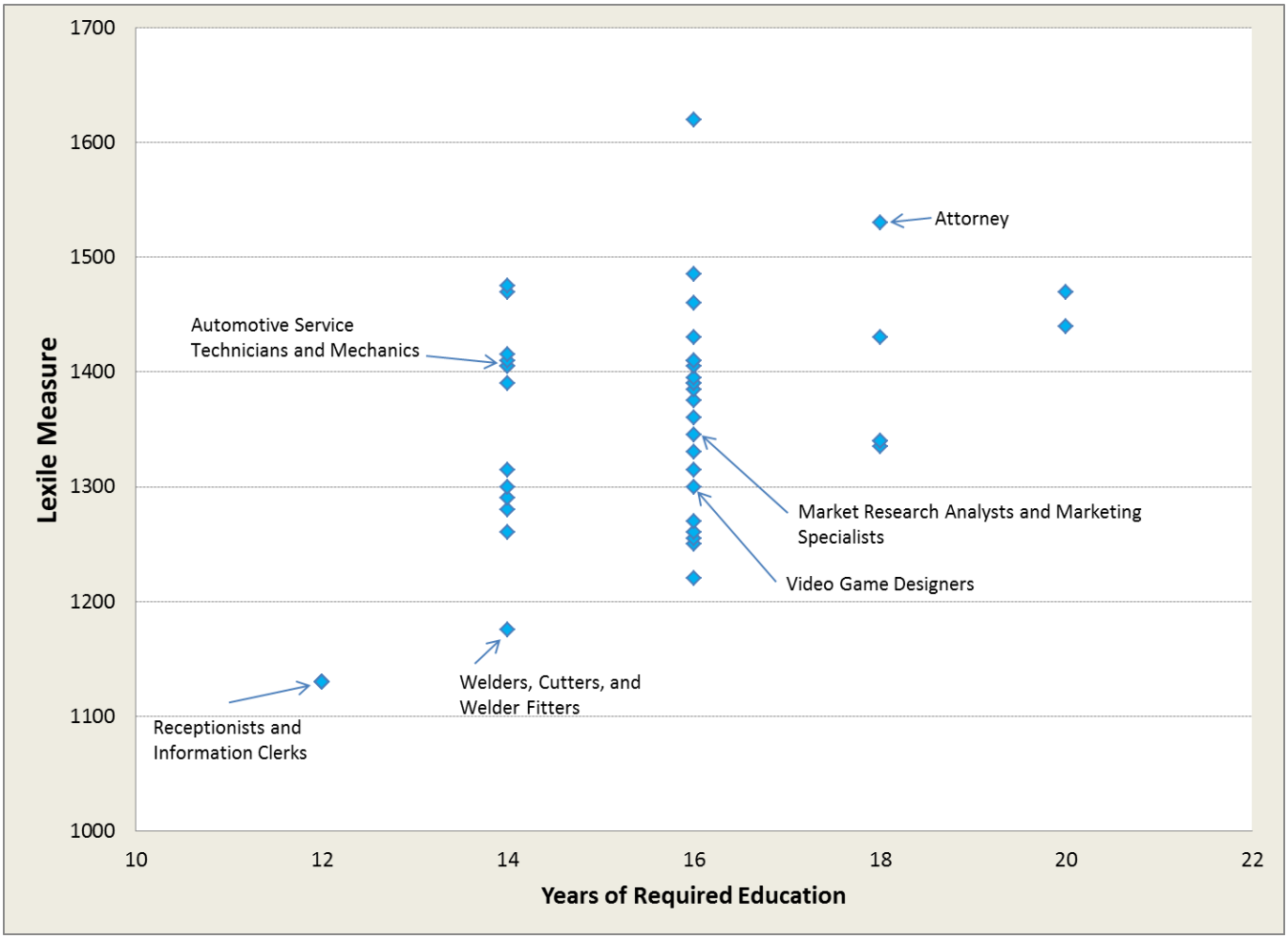

Figure 2. Median text complexity and education level for selected O*NET Bright Outlook Occupations (December 2012): Phase 1 linear systematic sample (n = 59 careers).

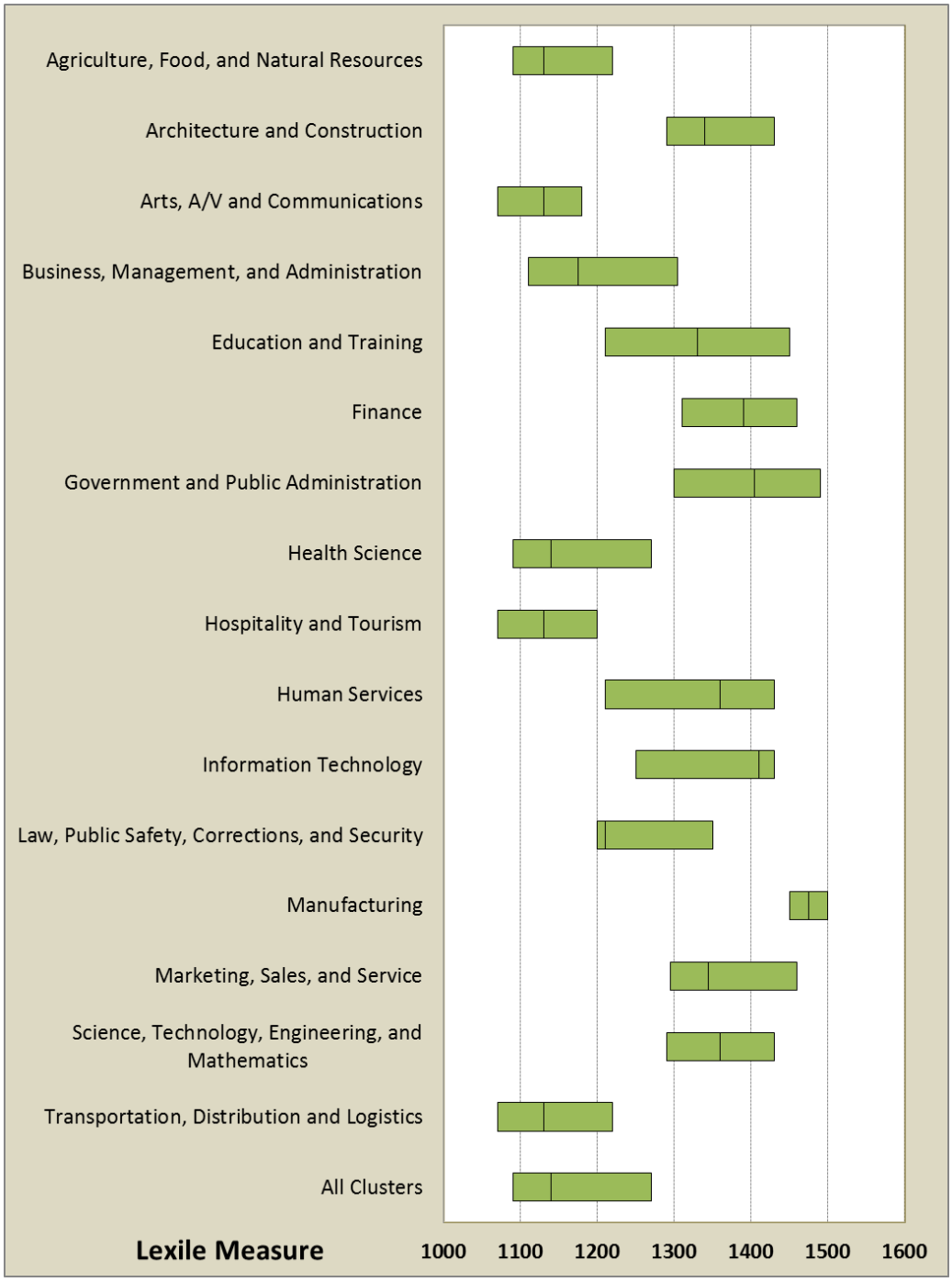

Figure 3. Text complexity for O*NET Bright Outlook Occupations (December 2012) by USED career cluster: Phase 1 linear systematic sample (n = 59). The median and inter-quartile range are displayed for each cluster and for all clusters combined.