Cambridge Assessment

To what extent is the language of this test question readable? Tools for investigating the linguistic accessibility of assessment material.

Conference Paper Abstract

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Assessment is a useful process as it provides teachers and other stakeholders (e.g. parents, government, employers) with information about students' competence in a particular subject area. However, for the information generated by assessment to be useful, it needs to be accurate. One factor that can undermine the accuracy, or validity, of assessment outcomes is the language of the assessment material. For instance, if a mathematics test question is phrased in a lexically and/or grammatically complex manner, it might prevent students from displaying their true mathematical knowledge and skills. This may result in teachers and other stakeholders drawing inaccurate inferences from the test scores. Students who are not native speakers of the target language are more likely to be disadvantaged by assessment material that displays low levels of linguistic accessibility. In an attempt to support teachers and test developers in designing linguistically accessible assessment material, this study explored practical ways of investigating the complexity of test questions both at the level of vocabulary (lexical complexity) and grammar (syntactic complexity).

The starting point of this research was the shortcomings of traditional measures of linguistic accessibility, or readability, and their limited applicability to test questions. For example, traditional readability measures often assume that longer words are more difficult to comprehend (see Lenzner, 2014). However, in the context of assessment, such words are normally subject-specific technical terms (e.g., *photosynthesis*, *Reformation*) with which students are expected to be familiar as they are part of the construct that is being assessed. Also, traditional readability measures tend to be based upon continuous prose and, as a result, are not well-suited for measuring the readability of texts that do not fit this format, such as multiple-choice questions. Furthermore, readability measures that are based on sentence length and text length do not consider the different cognitive challenges that various syntactic structures pose on readers (Lenzner, 2014). In response to these shortcomings, alternative ways of investigating the linguistic accessibility of assessment materials were explored. These involved undertaking lexical and syntactic analyses of test questions in an automated manner using software packages that are typically employed in the field of corpus linguistics.

To investigate linguistic accessibility in assessment material, three corpora of examination papers were compiled. The examination papers, all taken by students in the UK between 2015 and 2017, were obtained from three A level subjects: Biology, Business Studies and History. Each corpus was approximately 15000 words long and comprised several hundred examination questions.

The corpora were first analysed to identify examples of vocabulary that may be unfamiliar to candidates, particularly to candidates who do not have English as a first language. This lexical analysis was carried out via AntWordProfiler (Anthony, 2013), a software package that was used to compare the vocabulary of examination questions to a set of 'graded' vocabulary lists. The lists, which were developed by Nation (2018), were based on the frequency of words in large language corpora (e.g. British National Corpus).

Following the lexical analysis, the examination questions were subjected to grammatical, or syntactic, analysis. This involved identifying in the examination questions a number of grammatical features that are thought to increase complexity and therefore undermine accessibility. The grammatical analysis was facilitated by the Multidimensional Analysis Tagger (MAT) (Nini, 2015), a software package that generates grammatically annotated versions of corpora alongside frequencies of the different grammatical features occurring in the corpora. Using MAT, the three corpora were profiled grammatically revealing differences in how grammatical structures are typically used across subjects. Subsequently, pairs of examination questions similar in length but different in complexity were identified and were subjected to qualitative analysis to obtain an insight into the ways in which the use of grammar can increase or decrease accessibility.

This presentation will report some of the findings of this study and will discuss how specialist software, such as those explored in this study, can be used to support teachers and professional question writers in designing more effective tests.

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