Abs-148

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An argument-based approach to validate S: A newly developed measure of lexical richness

The purpose of this study is to validate S (Kojima, 2010), a newly developed approach to assess the lexical richness of written text produced by second language learners of English. Several measures have been proposed to examine the learners' productions regarding the frequency information of vocabularies used in the text, for example, Lexical Frequency Profile (Laufer & Nation, 1995) and P_Lex (Meara & Bell, 2001). None of these measures, however, seem satisfactory (Daller & Xue, 2007; Meara, 2005). A new measure, which is called S, is calculated by randomly sampling words from a transcript to produce a curve of the cumulative ratio of lexes against the frequency levels for the empirical data. By adjusting the value of the parameter S, the computer programme finds the best fit between this empirical curve and the theoretical curves, which is calculated using a mathematical model. To develop a mathematical model of the curve, I use a logarithmic assumption of the frequency distribution of vocabulary (Zipf, 1935). The theoretical curves indeed fitted well with the empirical curves of my data, which indicates that the measure is a promising one. Kojima (2010) shows that the advantages of S over Lexical Frequency Profile and P_Lex are that S can be used to evaluate shorter texts and can sensitively evaluate the texts of various levels of learners.

To further validate S, the present study employed an argument-based approach that was proposed by Kane (2006) and examined six hypotheses. For this purpose, written texts from 60 Japanese learners of English, half of them are in the intermediate levels and the others are in the high intermediate levels, are collected and analyzed on the basis of S. Each learner produced two pieces of written work. Corresponding data of English native speakers were also evaluated on the basis of S. The results indicated the following: (1) The fitness of the theoretical curves to the empirical curves of the real data is satisfactory, 2) inner consistency of S is high, 3) S is independent of the text length, 4) S values calculated from each subject's two essays correlate significantly, 5) S is moderately but significantly correlated with the scores of the Productive Vocabulary Levels Test (Laufer & Nation, 1999) and the scores of the Vocabulary Levels Test (Schmitt, Schmitt & Clapham, 2001), 6) S can significantly discriminate between the two levels of learner groups and native English speakers. Those results strongly support S's validity as a new measure of lexical richness. S is hopefully applied to various study purposes such as exploring the relationship between learners' mental lexicons and their vocabulary use in their written or spoken productions.

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