Automated entropy-based detection of mispronounced logatomes

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Abstract
This paper presents a controlled experiment focused on the entropy-based discrimination of mispronunciations of *logatomes* (monosyllabic pseudowords). The introductory part briefly describes the related symptomology and the current challenges posed by the main objective of our research theme: the development of a software solution for the automated screening of dyslalia in early school-age children. Statistically speaking, the weight of dyslalic disorders ranks first among speech disorders, whereas from a linguistic standpoint dyslalia mainly engages the phonetic tier. Its symptoms are distortion, substitution, omission or inversion of speech sounds (phonemes) and if undetected in due time and left untreated, it may have serious consequences for the subjects' school performance and the development of their personality. A few general remarks with respect to the phonological parameters of the target consonants are also made in the Introduction section. The Materials and Method section describes the conditions, the feature-extraction technique, the technology, and the materials used in the controlled experiment. The same section also makes a description of the manner of calculation of the information entropy values of each analyzed speech sample and the manner of comparison of such information entropy values, aimed at increasing the current rate of successful discrimination of misarticulation cases. A synthesis of the achieved results is provided in the Results section based on which conclusions are drawn and comments are made in correlation with the target consonants and the influence of the phonological context thereof, in the Conclusions section. The final section also contains a discussion on further research and development of our computerized dyslalia screening solution in light of the new findings.

Keywords:

Information Entropy; Logatomes; Dyslalia; Screening