Developing a Screening Instrument for Arabic Speaking Children With Reading Dyslexia

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Dyslexia is a neurodevelopmental disorder that primarily affects reading abilities. Early identification of dyslexia is crucial because targeting the symptoms early will improve the reading skills of children diagnosed with reading Dyslexia. It is necessary to develop technological tools for Dyslexia screening because diagnosing dyslexia is a time-consuming and expensive process. This research aims to create a reliable screening model to differentiate between dyslexic and typically developing (TD) children through eye movements in the same age group using statistical metrics while reading a piece of Arabic text from the Jordan Ministry Book. Therefore, an eye-tracking model was developed using Python, utilizing a variety of eye movement metrics, including Fixation Percentage, Fixation Words, and Regression Number. The study was conducted on 36 dyslexic children and 33 age-matched non-dyslexic children, aged 8 to 11 years old. The results were calculated using SPSS, and they showed that the group with dyslexia scored significantly higher than the neurotypical group in Fixation Percentage, Fixation Words, and Regression Number. The unpaired T-test gave a two-tailed P-value of less than 0.0001 for all parameters. In this study, an eye movement task was used, which, based on previous evidence, suggested good discriminability between dyslexic and non-dyslexic groups. This research's results support and fulfill the research objectives. In conclusion, this research proposed a simple, fast, and accurate experimental methodology by utilizing eye tracking to screen for dyslexia in children.

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