In The Mind’s Eye: Comparing Eye Movements and Ocular Patterns

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The many current tests for dyslexia and other disabilities are generally expensive, time-consuming, and tedious. This research was done as a continuation of an attempt to see if video could one day be used as a diagnostic tool, as this would be more appealing, less expensive, and more accurate than a written test whose results ultimately are based on the patient’s test-taking skills, rather than quantitative numerical data. In Phase 1, it was found that those with dyslexia had shorter gaze event durations than those without dyslexia, and there was a significant difference between the two groups ($p<0.05$). In Phase 2, it was expected that different disabilities and disorders would affect the focus of the participants’ eyes, and the duration of their gazes, in different ways. In order to test this hypothesis, the gaze event durations of the eyes of 43 participants (16 with primary dyslexia, 10 with Parkinson’s disease, and 17 with no disability) were analyzed by a T120 while participants watched a 5 minute video displaying randomly moving objects in 5-second clips. An ANOVA test was performed, and the data proved to show a very significant difference between the groups’ eye movements ($p<0.05$). Histograms and inferential statistics revealed that those with Parkinson’s disease had the shortest gaze durations, and the control participants had the longest gaze durations. These results supported the research hypothesis. This information and further research could potentially lead to the utilization of a universal video test for dyslexia, Parkinson’s disease, and other disabilities.