

# AB017. Group differences between individuals with dyslexia and normal readers while performing reading tasks

Zoey Stark<sup>1</sup>, Leon Franzen<sup>1,2</sup>, Aaron Johnson<sup>1,3</sup>

<sup>1</sup>Department of Psychology, Concordia University, Montreal, QC, Canada; <sup>2</sup>Institute of Neuroscience and Psychology, Glasgow University, Scotland, UK; <sup>3</sup>CRIR/Centre de Réadaptation MAB-Mackay du CIUSSS du Centre Ouest de l'Île de Montréal, QC, Canada  
*Correspondence to:* Aaron Johnson, PhD. Concordia University, Department of Psychology, 7141 Rue Sherbrooke Ouest, Montréal, QC H4B 1R6, Canada. Email: aaron.johnson@concordia.ca.

**Background:** Individuals with dyslexia present with a variety of reading related deficits including text comprehension, reading speed and word encoding. While previous literature addresses individual components of group differences, the present study compares individuals with dyslexia and normal readers on a variety of eye tracking components, as well as behavioural reading measures. The applied nature of this research allows for a comprehensive understanding of how individuals with dyslexia perceptually encode and process written texts. Using type font (i.e., Times New Roman *vs.* OpenDyslexic; a font created to elevate visually specific characteristics of dyslexia) as a mediator, we investigated the group differences in eye movement patterns, text comprehension and reading speed between normal readers and individuals with dyslexia when reading standardized and validated texts designed for a grade six reading comprehension level.

**Methods:** Our 73 participants included 38 normal reading controls and 35 individuals with dyslexia. Participants were administered the symbol search and coding subtests of The

Wechsler Adult Scale of Intelligence. Participants then read ten texts from the International Reading Speed Texts: five texts in Times New Roman and five in OpenDyslexic, while binocular eye movements were recorded using a SR Research Eyelink 1000.

**Results:** We found that irrespective of font type, when compared to controls, individuals with dyslexia demonstrated increased re-reading of texts [i.e., regressions: CI (-0.99, -0.66), Hedges's  $g_s = -0.83$ ] and number of saccades per trial [CI (-1.42, -1.08),  $g_s = -1.25$ ] as well as increased median fixation duration [CI (-1.15, -0.82),  $g_s = -0.98$ ]. The control group had increased reading speed [words per minute: CI (1.48, 1.84),  $g_s = 1.65$ ], visited less interest areas [CI (-1.48, -1.13),  $g_s = -1.31$ ], and had fewer directional deviations from the horizontal-axis [CI (-0.49, -0.18),  $g_s = -0.33$ ]. We found an interaction between text comprehension and font type, with both groups having improved performance with OpenDyslexic. However, results did not show a main effect of group with respect to text comprehension.

**Conclusions:** The lack of group differences in text comprehension illustrates that high-functioning individuals with dyslexia are able to comprehend these elementary level texts, irrespective of font type. However, the erratic nature of their eye movements combined with a slow reading speed suggest that individuals with dyslexia read texts in a different manner; achieving the same understanding as normal readers. Our results suggest that reading speed differences act as compensatory methods in our sample of individuals with dyslexia.

**Keywords:** Dyslexia; eye-tracking; group differences; reading comprehension

doi: 10.21037/aes.2019.AB017

**Cite this abstract as:** Stark Z, Franzen L, Johnson A. Group differences between individuals with dyslexia and normal readers while performing reading tasks. *Ann Eye Sci* 2019;4:AB017.