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Gaze Behaviour of Individuals with and without Intellectual Disability for Nonaccidental and Metric Shape Properties

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Abstract : Eye Gaze behaviour of individuals with and without intellectual disability are investigated in an eye tracking study in terms of sensitivity to Nonaccidental (NAPs) and Metric (MPs) shape properties. Total fixation time is used as an indirect measure of attention allocation. Studies have found Mean reaction times for non accidental properties (NAPs) to be shorter than for metric (MPs) when the MP and NAP differences were equalized. METHODS: Twenty-five individuals with intellectual disability (mild and moderate level of Mental Retardation) and twenty-seven normal individuals were compared on mean total fixation duration, accuracy level and mean reaction time for mild NAPs, extreme NAPs and metric properties of images. 2D images of cylinders were adapted and made into forced choice match-to-sample tasks. Tobii TX300 Eye Tracker was used to record total fixation duration and data obtained from the Areas of Interest (AOI). Variable trial duration (total reaction time of each participant) and fixed trail duration (data taken at each second from one to fifteen seconds) data were used for analyses. Both groups did not differ in terms of fixation times (fixed as well as variable) across any of the three image manipulations but differed in terms of reaction time and accuracy. Normal individuals had longer reaction time compared to individuals with intellectual disability across all types of images. Both the groups differed significantly on accuracy measure across all image types. Normal individuals performed better across all three types of images. Mild NAPs vs. Metric differences: There was significant difference between mild NAPs and metric properties of images in terms of reaction times. Mild NAPs images had significantly longer reaction time compared to metric for normal individuals but this difference was not found for individuals with intellectual disability. Mild NAPs images had significantly better accuracy level compared to metric for both the groups. In conclusion, type of image manipulations did not result in differences in attention allocation for individuals with and without intellectual disability. Mild Nonaccidental properties facilitate better accuracy level compared to metric in both the groups but this advantage is seen only for normal group in terms of mean reaction time.

Keywords : eye gaze fixations, eye movements, intellectual disability, stimulus properties
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