Process Analysis of Visual Search in ADHD, Autism and Healthy Controls – Evidence from Intra- Subject Variability in Gaze Control.

Divya P. Seernani, Holger Hill, Giuseppe Boccignone, Tom Foulsham, Christian Fleischhaker, Monica Biscaldi, Ulrich Ebner-Priemer, Christoph Klein

Department of Child and Adolescent Psychiatry, Medical Faculty, University of Freiburg, Germany; Institute of Sports and Sports Sciences, Karlsruhe Institute of Technology, Germany; Department of Computer Science, University of Milan, Italy; Department of Psychology, University of Essex, United Kingdom; School of Psychology, Bangor University, United Kingdom; Department of Child and Adolescent Psychiatry, Medical Faculty, University of Cologne, Germany
divya.seernani@uniklinik-freiburg.de

Increased Intra subject variability, i.e. moment to moment fluctuations in performance, is a candidate endophenotype of Attention Deficit Hyperactivity Disorder (ADHD. In light of potential etiological overlap between ADHD and Autism Spectrum Disorder (ASD) (Biscaldi et al., 2015; Rommelse et al., 2011), it is important to study ISV, in both aforementioned disorders simultaneously. Here, we broaden the study of ISV from reaction time tasks with manual responses to the ISV of gaze control. Children and adolescents with ADHD, ASD and healthy controls, aged 10-13 years (N = 90; all native German speakers) were invited for an oculomotor testing session. Participants were presented a visual search task. The task required participants to find a Portuguese target word shown above a grid with multiple Portuguese German word pairs and indicate its position by pressing response keys matching the search array. Preliminary analysis have been calculated with moment-to-moment fluctuations in eye movements for the period of search. Preliminary results suggest increased ISV in the ADHD group. Our study extends the ISV finding to the ocular-motor domain, proposes methods to study ISV in gaze movement, and highlights its relationship with ASD.

When one target predicts the other: Target guidance in visual search

Christof Körner, Jonas Potthoff
University of Graz, Austria
christof.koerner@uni-graz.at

Knowledge about a target feature such as its luminance can guide search efficiently. Here we investigated how a search for a target is guided when its luminance is indicated by the luminance of another target. Nineteen participants searched for two target letters (T's) among distractors (L's) in displays of 10 high- and 10 low-luminance items. Critically, the luminance of the first found target during search indicated the luminance of the second target (same vs. different). Hence, the luminance information could be retained or had to be updated to guide search for the second target. In a third (random) condition there was no consistent luminance relationship between the targets. We counted the number of fixations necessary to find the second target as a measure of search guidance. Compared to the random condition, participants needed substantially fewer fixations to locate the second target when the first target indicated its luminance. Interestingly, participants made an additional fixation on distractors sharing the luminance of the first target when, in fact, luminance information had to be updated. Our results suggest that the search for a target could be effectively guided by luminance information of another target but slightly less so if an update was required.