Audiovisual Synchrony Perception in Autism Spectrum Disorders

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Introduction: The ability to integrate synchronous auditory and visual information is a crucial part of everyday life. Studies investigating lip reading (Smith & Bennetto, 2007) and the McGurk illusion (Irwin, 2006) have suggested that individuals with Autism Spectrum Disorders (ASDs) integrate audio and visual information less than typical developed (TD) individuals. When looking at the temporal aspect of audiovisual integration, children with ASDs show an extended temporal integration window (TIW) compared to TD controls (e.g., Foss Feig et al., 2010), whereas adolescents in both groups performed comparably (Grossman et al., 2009).

Preliminary study
Methods: 4 adult males with ASDs and their age, sex & IQ-matched controls were presented with audiovisual point-light drumming displays, which were either congruent, incongruent or inverted. Within the audiovisual display, the degree of audiovisual asynchrony was manipulated, i.e., the auditory information was presented 33, 267, 200, 133 and 67 ms before or after the visual information. Participants indicated whether the drumming sequence was synchronous or asynchronous.

Conclusion: These preliminary results suggest that high-functioning adults with ASDs are able to integrate audiovisual information to the same degree as TD adults.

Main study (in progress)
Method: 16 adult males with ASDs and age, sex & IQ-matched controls will be presented with the same stimuli and task as in study 2. This will be the first study to assess TIW in ASD using such a variety of stimuli. It will be interesting to see whether synchrony perception in ASD is dependent on the type of display.

References:

Results: The TIW were comparable between the ASD and control group across all of the conditions.

Predicted results:

Similar TIWs between the groups. Even though children with ASDs have a wider TIW the results in adults and adolescents suggest that this abnormality is masked by compensatory mechanisms developed later in life. Compensatory mechanisms in ASDs have been shown in other tasks (McKay et al., 2012).

Wider TIW in the ASD group. Most literature points towards a wider TIW in the ASD group compared to the TD group. A wider TIW could be due to a reduced signal-to-noise ratio in individuals with ASDs (Simmons et al., 2009). A wider TIW in the ASD group for social stimuli. The TIW is more narrow dependent on expertise in a particular field (Petrini et al., 2009). Since people with ASDs often have communication difficulties this would suggest a wider TIW for social speech stimuli.

A wider TIW for non-meaningful stimuli. Grossman et al. (2009) suggested that people with ASDs perform equally to controls when the stimuli are more meaningful.