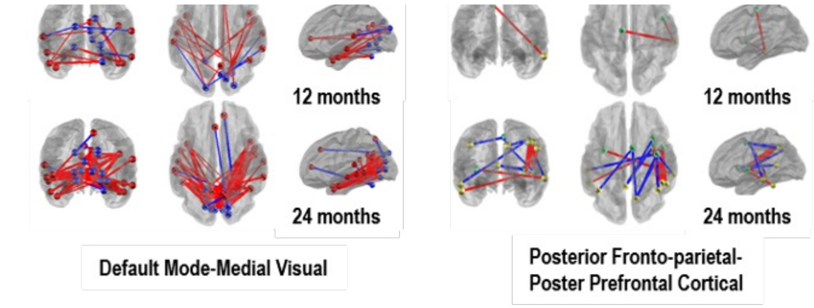
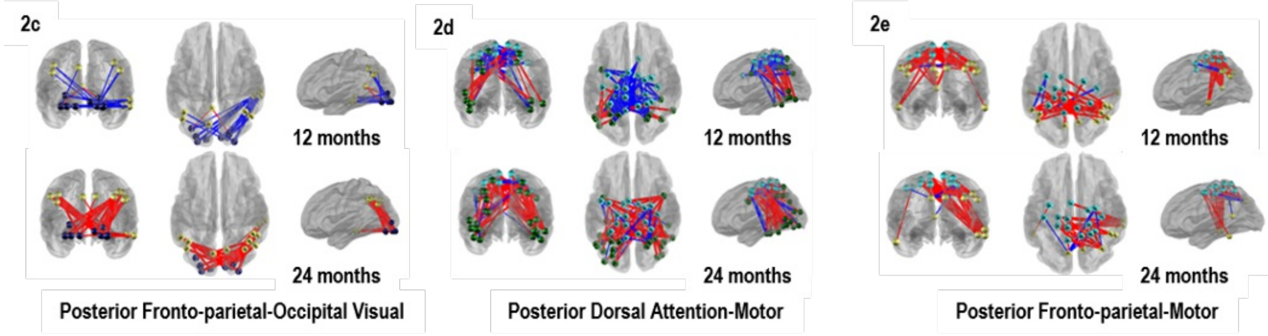


Correlations in Network Pairs at 12 and 24 months: 2a & b show the 2 network pairs with a significant change in the pattern of enrichment based on the McNemar test. Red and blue lines indicate positive and negative brain-behavior relationships, respectively. At 24 months, both 2a and 2b show more ROI pairs whose fc significantly correlates with motor function. 2c-e display the 3 significant network pairs at 12 and 24 months *which did not significantly change in amount of enrichment*. In 2c, the direction of the fc-motor correlations switched from negative to positive, while in 2d, a profile of mixed positive and negative fc-motor correlations became predominantly positive, showing the potential for marked variability in brain-behavior relationships over time.



Poster Session
122 - Cognition: Attention, Learning, Memory
5:30 PM - 7:00 PM - Hall A

1 **122.001** . Altered Pupil Responsivity to a Gaze Following Task in Children with an Autism Spectrum Disorder

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Background: Previous research has shown that changes in pupil size reflect cognitive resource allocation. Moreover, pupillary response is often used as a physiological measure for emotional arousal. Therefore, pupillary responses potentially can provide more insight in cognitive deficits and stress regulation as an underlying mechanism in deficits characteristic for Autism Spectrum Disorders (ASD).
Objectives: The aim of this study is to investigate which aspect primarily affects the physiological response (i.e., pupillary response) to a gaze following task in children with ASD and age-matched typically developing children, i.e. an object presence or an adult's eyes state.
Methods: Twenty children were divided into three groups: 7 children with an ASD (mean chronological age 64 months, SD 7.6 months and mean mental age 35.8 months, SD 19.9 months), 7 mental-age-matched typically developing children (mean chronological age 36.7 months, SD 19.4 months) and 6 chronological-age-matched typically developing children (mean chronological age 63.1 months, SD 9.2 months). All children were observed when seeing a video clip in which a female adult model, wearing a black shirt, sat behind a table against a neutral background. The clip had two open-eyes state conditions and two closed-eyes state conditions. Each condition was once performed towards an object (object-present) and once towards an empty space (object-absent), resulting in four conditions in total.
Results: Multilevel regression analyses revealed a statistically significant negative association between the object presence and pupillary response (b=-0.1, SE=0.04, p= .03). No association was found between the eyes state and pupillary response. Furthermore, both the mental-age-matched c and chronological-age-matched typically developing children had a significant larger pupil dilatation (b=0.15, SE=0.07, p= .04; b=0.29, SE=0.08, p< .001) than children with an ASD. No significant interaction was found between group (i.e., ASD vs. mental-age-matched and chronological-age-matched children) and object presence.
Conclusions: The results of this study confirm earlier studies showing altered physiological reactivity to a gaze following task in children with an ASD. More specifically, we found that children with an ASD show less pupil dilatation over all conditions compared to typically developing children. Additionally, the present study suggests that children's pupillary responses are not influenced by the adult's eyes, but rather by the presence of objects. Children showed less pupil dilatation when the adult looked at an object compared to an empty space, but this response did not differ between children with ASD and mental-, respectively chronological-age-matched peers.

2 **122.002** A Profile of Visual Illusion Susceptibility in ASD

***O. Landry**[1], I. Sperandio[2], S. Crewther[3] and P. Chouinard[1], (1)La Trobe University, Bendigo, Australia, (2)University of East Anglia, Norwich, United Kingdom, (3)La Trobe University, Melbourne, Australia*

Background: Visual illusions provide a means to understand how contextual visual information is used to perceptually rescale how people see objects in the world. Previous research examining illusion susceptibility in ASD has yielded inconsistent conclusions as to whether or not people with an ASD perceive illusions differently. One possible explanation is that previous research has tended to treat global processing, which underlies illusory susceptibility, as a singular cognitive construct. We hypothesize that one cannot treat visual illusions this way. Illusions come in different classes, each class reflecting distinct cognitive operations, which may or may not be affected in ASD.
Objectives: Our objectives were to test a battery of visual illusions in participants with ASD and examine susceptibility across different classes of illusions. These classes of illusions were derived in a separate study of 131 typically developing adults using factor analysis (Chouinard et al., under review).
Methods:
24 participants, including 12 with ASD were included. Comparison participants were selected to best match the participants with ASD one-to-one on age and Raven's Progressive Matrices raw scores (mean age: 13 yrs, range: 7 to 23 yrs; mean RPM score 36, range 24-50). We measured susceptibility to 13 of some of the most frequently tested visual illusions using the Methods of Adjustment approach. The illusion battery consisted of the Ponzo, Sander's Parallelogram, Ehenstein, Jastrow (Component 1), Helmholtz-Square, Horizontal-Vertical line, Muller-Lyer, (Component 2), Delboeuf, Ebbinghaus (Component 3), Shepard's tabletops, Square-Diamond (Component 4), Oppel-Kundt and Poggendorf (Component 5) illusions. To allow meaningful comparisons between illusions, we computed normalised indices of susceptibility for each illusion as: ((Perceived Size of Stimulus B - Perceived Size of Stimulus A) / (Perceived Size in Stimulus A + Perceived Size of Stimulus B)); B denoting the stimulus one would expect to see greater judgements in perceived size. Participants also completed control tasks to measure basic abilities in visual acuity and discrimination.
Results:
We found significantly reduced susceptibility on Component 4 (t(22) = 2.10, p=.048) but not on any of the other four Components (largest t(22)=1.71, p=.10). Examination of the illusions that made up this Component revealed that the reduced susceptibility was specific to the Shepard's tabletop illusion (t(22)=2.28, p=.032) and not found for the Square-Diamond illusion (t(22)=0.20, p=.844).
Conclusions: In ASD, we found reduced susceptibility to one specific illusion, the Shepard's tabletop illusion. This is consistent with a previous report by Mitchell, Mottron, Soulières, and Ropar, (2010). Furthermore, in adults, this specific illusion elicits a strong illusory percept, which is correlated with autistic traits as measured by the AQ (Chouinard et al., under review). Within our sample, the Shepard's tabletop is also the only illusion for which children's susceptibility scores are lower than those of adults (as reported in Chouinard et al., under review), however susceptibility was not correlated with age within our sample. These findings will contribute to our more general understanding of altered visual perception in ASD, shedding light into the nature of global processing. Particularly, what types may or may not be affected in ASD.