Is there a social motion preference in autistic adults?

Magdalena Matyjek, Nico Bast, Salvador Soto-Faraco

BACKGROUND & AIMS

• Autism is associated with attenuated social attention and sensory atypicalities [1].

• In comparison to neurotypical (NT) children, autistic (AUT) children look less at social (SOC) motion scenes and more at geometrical (GEO) ones [2]. Yet, it is unknown whether this imbalance persists into adulthood.

• The underlying mechanism may be the atypical assignment of saliency in sensory processing [3], as indexed by the pupil responses (reflecting the activity of locus coeruleus) [3,4].

• We tested (behavioural) looking preference and saliency assignment (gaze responses) for SOC vs. GEO motion in AUT and NT adults.

HYPOTHESES

AUT and NT would differ in the relative:

Hyp. 1: looking preference
Hyp. 2: pupil responses

so that: (SOCNT – GEOAUT) > (SOCAUT – GEONOT)

RESULTS

PLANNED ANALYSES

TASK 1: LOOKING PREFERENCE

Model:
preference ~ group + (1(subject)) + (1(trial))

Behavioural looking preference per group

% of NT show preference for SOC (PRP > 0)

NT: 63.6%  P < .001

GEO: 1.7%  P = .88

Example: Stimuli set: 10 x 6s videos

Counterbalancing presentation side for SOC/GEO and randomised trials

Measurement: Looking preference (SOC/SOC+GEO)

The model yielded a group effect on the cubic term (group*time*interaction) [t = -1.8, 16(10) = -3.9, p < .001] and 3-way interactions of group, condition, and all three time terms (all p < .006).

While both groups showed a larger pupil response to SOC than GEO, the shape of the relative difference between pupil responses in the two conditions is different between the groups: AUT dilate pupils faster to SOC than NTs, and this difference persists over time (at least up to 6s).

EXPLORATORY ANALYSIS

Because larger pupil sizes in AUT vs. NT for SOC were an unexpected result, we further tested whether this effect could be explained by social anxiety traits (measured with Liebowitz Social Anxiety Scale: LSAS [5]).

pupil = β0 + β1*group*LSAS + β2*contrast + β3*(binomial.3)*LSAS

LSAS was not significant as main effect, nor did it have a significant effect on any other term in the model (all p > .25). Bayes Factors revealed overwhelming evidence in favour of the model without social anxiety (BF10 > 100).

So: the larger pupil sizes for SOC in AUT than NT cannot be explained by social anxiety traits.

DISCUSSION

Looking preference

Autistic and non-autistic adults differ in their looking preference for social and geometrical motion. While the non-autistic group shows a strong preference for the social motion, there is no clear preference for either motion type in the autistic group.

Saliency of social and geometrical motion

Social motion seems to be perceived as more salient (as measured by pupilary responses) by both groups. However, the pupil in the autistic group dilated faster and stronger for this type of motion than in the non-autistic group, which could not be explained by social anxiety traits. It is possible that this difference indexes increased effort for processing of social motion in autists.

Conclusion

Social motion preference (or lack thereof) might be a potential autism marker, even in adulthood.