Attention to Faces and Gaze Direction during Action Change in Toddlers with Autistic Traits

Saaristo, V.[1], Helminen T.M.[1], Itäjärvi, T.[1], Husu, E. [1], Špakov, O. [2], Mattila, H. [1] & Kylliäinen, A.[1]

1. Faculty of Social Sciences / Psychology, Tampere University, Finland;
2. Faculty of Information Technology and Communication Sciences/ Computing Sciences, Tampere University, Finland

Background

Face and gaze direction convey important information about another person's intentions. Previous research has shown that, already in early development, autistic children tend to look less at others' faces compared to non-autistic children (Chawarska, 2012). This reduced attention to faces may result in missing socially relevant information, particularly during key moments of interaction.

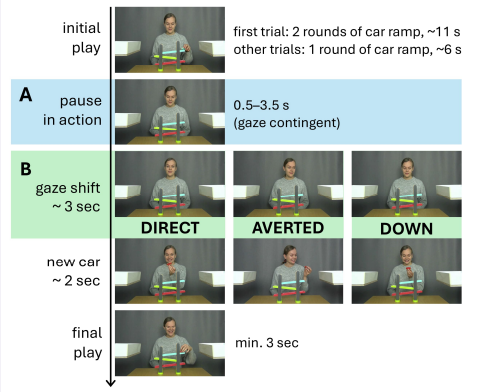
Aims

- To investigate whether early autistic traits are associated with looking at the face area during moments when socially meaningful nonverbal signals might occur – that is, during ambiguous changes in a person's actions, such as a pause in action.
- To examine how different gaze conditions (direct, averted, down) affect attention capture.

Methods

Participants: 114 toddlers

- 84 M-CHAT-R/F screen-positives, 30 screen-negatives from a population-based sample
- Age: Mean = 18.2 months, Range 13.7-25.4
- Sex: female = 41, male = 73
- ADOS-2 toddler module: Mean = 10.9, Range = 1-26

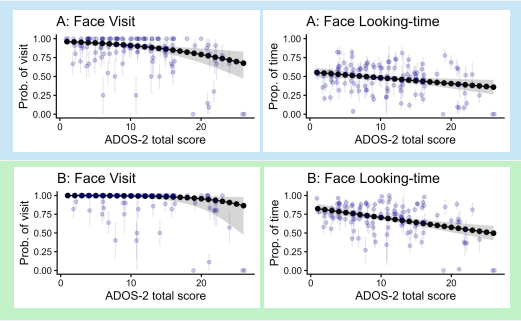


12 trials of video stimuli, showing a lady playing with a car ramp were presented while the toddlers' gaze behavior was recorded using an eye tracker.

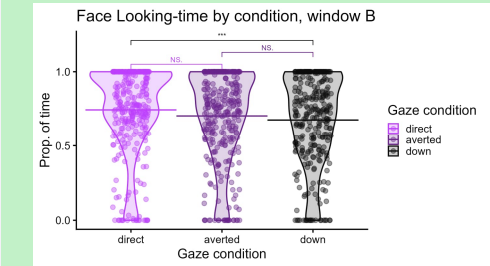
Analyses:

- Mixed-effects models were used to assess the association between ADOS-2 scores and looking at the face area (FAOI) during the two time-windows (A, B) across the different gaze conditions.
- Variables:
  1. Fixating on the face area (*Face Visit*, yes/no),
  2. Proportional duration of looking at the face (*Face Looking-time*).

Results



Higher ADOS-2 scores were associated with decreased probability of the ***Face Visit*** and reduced ***Face Looking-time*** in both **window A** (visits: *OR*=0.55, *CI95%*=0.40-0.76, *p*<.001; proportion: *b*=-0.14, *F*(1;107.33)=7.24, *p*=.008) and **window B** (visits: *OR*=0.29, *CI95%*=0.14-0.62, *p*=.001; proportion: *b*=-0.26, *F*(1;106.65)=19.83, *p*<.001).



In window B, there was a significant effect of gaze condition on ***Face Looking-time*** (*F*(2,849.18)=4.58, *p*=.011) with faces with direct gaze being looked at longer than those with downcast gaze (*b*=0.20, *t*(852)=2.95, *p*=.008). There was no significant interaction between condition and ADOS-2 scores.

Conclusions

The results indicated that higher early autistic traits were associated with a lower probability of looking at faces and shorter face looking times during socially meaningful moments.

Faces with direct gaze attracted longer attention than those with downcast gaze, regardless of their autistic traits, evaluated by ADOS-2.

Future longitudinal studies will reveal how these findings relate to the child's behaviour in real life situations, and whether these early face-specific attention patterns evolve into gaze-specific attentional preferences later in development.

INSAR2026
terhi.helminen@tuni.fi