



PRESS RELEASE

Geneva | 11 January 2024

How does social attention develop in autistic children?

A UNIGE team shows how visual social skills develop in a unique way in children with autistic disorders.

As they grow, children increasingly focus their attention on social elements in their environment, such as faces or social interactions. However, children with autism are often more interested in non-social stimuli, such as textures or geometric shapes. By tracking where children look while viewing a cartoon, a team from the University of Geneva (UNIGE) has revealed that attention in autistic children does not follow the same developmental trajectory as that of typically developing children. Instead, they each gradually develop their own unique attentional preferences. These results, published in *eLife*, argue in favour of early interventions aimed at enhancing social attention, which could help guide autistic children onto developmental courses more akin to their peers, paving the way for tailored, individualized support.

Right from birth, babies are endowed with innate abilities that are crucial for their survival and adaptation. Among these innate abilities is a complex attentional system, finely tuned to detect the presence of others. Thus, from the very beginning of their lives, newborns show fascination for faces and face-like configurations, especially moving ones. Such preference for biological movement early in life is vital for development, serving as the primary driver of exploration and interaction with the environment, eventually setting the stage for more complex social interactions.

This fundamental, widely shared social attention can, however, be impaired in children with autism spectrum disorders (ASD). This highly diverse neurodevelopmental condition is characterized by repetitive behaviors and specific interests accompanied by significant challenges in communication and social interactions.

Eye-tracking

Are these social challenges expressed in the same way in all children with ASD? Do they vary according to the intensity of the disorder and/or age? Using an eye-tracking device that records eye movements in real time, a UNIGE team analysed the visual preferences of 166 children with ASD and 51 typically developing children (TD) while they freely viewed a short cartoon. The participants, all boys for sample homogeneity, ranged from two to seven years old, and were repeatedly tested as they developed.

“Each child watched a three-minute cartoon featuring a little donkey in various social situations, without any specific instructions. This was not a cartoon specially designed for our study, but rather one

High resolution pictures

that is very popular among children in this age group,” explains Nada Kojovic, a postdoctoral scholar in the Department of Psychiatry at the UNIGE Faculty of Medicine and first author of the study.

Desynchronised attention in ASD

Typically developing children are observed to focus their attention on social interactions between characters, and as they grow older, to increasingly look at the very same social elements in a scene. This phenomenon of “synchronisation” observed in typically developing children is absent in ASD children. The latter show an interest in other types of stimuli - such as objects or certain irregularities in the cartoon scenery - and over time each ASD child develops his or her own unique visual preferences.

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DOI: [10.7554/eLife.85623](https://doi.org/10.7554/eLife.85623)

“It is likely that we could identify sub-groups with common preferences among ASD children, but there is no real synchronisation of attention over the course of their development, unlike what is observed in TD children. This is the first time that a study has highlighted this developmental phenomenon,” states Daphné Bavelier, a full professor in the Psychology Section of the UNIGE’s Faculty of Psychology and Educational Sciences, and a co-author of the study.

The researchers also observed that the autistic children whose gaze was most alike that of typically developing ones function better in everyday life and have better cognitive skills. And crucially, the way in which a child views a social scene, such as the cartoon used here, can be used to predict future social difficulties.

In favour of early intervention

“These findings show how important it is for therapeutic interventions to target social attention at a very early stage in ASD children, especially those with the greatest developmental delay. Indeed, this work shows that if autistic children do not show interest in social interactions early on, they will become increasingly disinterested in them,” explains Marie Schaer, associate professor in the Department of Psychiatry at the UNIGE Faculty of Medicine, who led this research.

Moving forward, the UNIGE research team plans to apply its eye-tracking method to evaluate children who have benefited from a behavioural intervention known as the Early Start Denver Model (ESDM). This intensive behavioural intervention, developed in the United States, is designed to enhance communication skills in young autistic children through playful interactions. Since 2012, over a hundred autistic children under the age of three have benefited from this method in Geneva, showing encouraging outcomes. The researchers hope that their innovative eye-tracking technique will shed light on how this behavioural intervention contributes to the progress of ASD children, providing a unique tool to improve on strategies for supporting their development.

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