

Face Recognition and Metacognitive Monitoring in Individuals with Autism Spectrum Disorders

Introduction

The human face is an important source from which social information is obtained to facilitate social interaction (Ellis, 1990). In everyday life, individuals view faces in a range of contexts where the recognition of familiar or unfamiliar faces is required. For appropriate social interaction to occur, it is important that individuals demonstrate awareness of their face recognition performance. Such awareness reflects the ability to engage in metacognitive monitoring, an advanced form of cognitive processing which involves making judgements about current mental states. For typically developing individuals, viewing unfamiliar faces under contexts of increasing exposure duration positively affects recognition accuracy and results in improved metacognitive monitoring (Weber & Brewer, 2004). Whether these patterns apply to individuals who are not typically developing, such as individuals with Autism Spectrum Disorders (ASDs), is yet to be investigated. It has been widely documented that individuals with ASDs demonstrate impairments in their face recognition, and that such impairments may contribute to their social interaction impairments. The present study explored whether individuals with ASDs demonstrate any changes in face recognition performance and any evidence of metacognitive monitoring across different contexts of facial stimuli exposure duration. Investigation of these issues is important to provide insight into whether face recognition performance can be improved in individuals with ASDs, whether they can effectively judge mental states of recognising faces, and whether they can use these judgements to guide their social behaviour.

Method

Participants

Fourteen adolescents and adults with a diagnosis of an Autism Spectrum Disorder were part of the ASDs group. Two participants had a diagnosis of Autistic Disorder and 12 had a diagnosis of Asperger's Disorder. The performance of the ASDs group was compared with that of 14 typically developing individuals who formed the control group.

Procedure

Measures of verbal and non-verbal ability were taken in order to match the two groups. Participants viewed three sequences of facial stimuli and three sequences of non-facial stimuli; one at a short exposure duration, one at a medium exposure duration, and one at a long exposure duration. Participants were asked to make recognition decisions and provide a confidence judgement for every decision. Recognition accuracy was measured by calculating the percentage of correct decisions, and metacognitive monitoring was calculated by comparing confidence and accuracy.

Results

There were 11 participants with Asperger's Disorder who demonstrated no impairments whatsoever relative to the typically developing group. Their recognition of both facial and non-facial was just as good as the typically developing group, and improved at a similar level as exposure duration increased. Similarly, their metacognitive monitoring of both facial and non-facial recognition performance was unimpaired and improved as exposure duration increased.

There were 2 participants with Autistic Disorder and 1 with Asperger's Disorder who demonstrated different patterns to the 11 with Asperger's Disorder. This subgroup of participants demonstrated poor recognition of both facial and non-facial stimuli, which was consistently at a chance level. There was no improvement in recognition performance as exposure duration increased, and these participants did not demonstrate any metacognitive monitoring (but were quite overconfident) of their recognition performance.

Discussion and Conclusions

As the sample size in the present study was quite small, strong conclusions cannot be made. However, the implications of these findings for face recognition are worth discussing.

The finding of a small subgroup who demonstrated poor performance relative to the other participants with Asperger's Disorder and the typically developing group is interesting. If the performance of all three was due to a disorder-related impairment then the considering face recognition and

metacognitive monitoring impairments along a spectrum may be relevant for individuals with ASDs. However, if the poor performance of the participant with Asperger's Disorder reflected a lack of understanding or compliance with task requirements, then these impairments may only be salient for individuals with Autistic Disorder, and not in Asperger's Disorder. Researchers have often grouped the two disorders together when discussing face recognition impairments, and the present findings suggest that face recognition was not an issue in the majority of individuals with Asperger's Disorder. It may be that individuals with Autistic Disorder (or individuals with more severe impairment along the autism spectrum) require training in being able to assign confidence levels and judge current mental states whenever they view faces. In contrast it may be that individuals with Asperger's Disorder (or those with less severe ASDs impairment) can effectively monitor when their face recognition is good and when it is poorer, but need training in being able to apply their accurate judgements to guide social behaviour.

The current findings suggest that face recognition and metacognitive monitoring impairments may not be present in all individuals with ASDs. Nevertheless, faces are an important source of social information. Thus, increasing the ability of individuals with ASDs to (1) recognise important social information from faces, (2) effectively monitor when they have recognised important information, and (3) effectively use their monitoring judgements to guide behaviour, may be important in improving the social impairments observed in individuals within this population.

Future research is needed in order to ascertain whether the patterns observed in the present study are an accurate reflection of face recognition performance and metacognitive monitoring in individuals with ASDs.

References

- Ellis, H. D. (1990). Developmental trends in face recognition. *The Psychologist*, 3, 114-119.
- Weber, N., & Brewer, N. (2004). Confidence-accuracy calibration in absolute and relative face recognition judgements. *Journal of Experimental Psychology: Applied*, 10, 156-172.