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An islet of social ability in Asperger Syndrome: Judging social attributes from faces

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Abstract

We asked adults with Asperger Syndrome to judge pictorial stimuli in terms of certain social stereotypes to evaluate to what extent they have access to this type of social knowledge. Sixteen adults with Asperger Syndrome and 24 controls, matched for age and intelligence, were presented with sets of faces, bodies and objects, which had to be rated on a 7-point scale in terms of trustworthiness, attractiveness, social status, and age, or, in the case of objects, price. Despite impaired performance on two important aspects of social cognition (second-order mentalizing and face recognition) the social judgements of the individuals with Asperger Syndrome were just as competent and consistent as those of their matched controls, with only one exception: there was a trend for them to be less able to judge the attractiveness of faces if they were the same sex. We explain this difference in terms of a weakness in mentalizing, specifically the ability to take a different point of view: While all other stereotypic attributions could be made from an egocentric point of view, judging the attractiveness of faces of one's own sex requires taking the perspective of someone of the opposite sex, a challenge for people with mentalizing problems. We conclude that individuals with Asperger Syndrome show preserved aspects of social knowledge, as revealed in the attribution of stereotypes to pictures of people. These findings suggest that there are dissociable subcomponents to social cognition and that not all of these are compromised in Asperger Syndrome.
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1. Introduction

The social impairments present in autism-spectrum disorders form part of the essential diagnostic criteria used to define such conditions (DSM-IV; American Psychiatric Association, 2000). Asperger Syndrome (AS) is widely acknowledged to be a variant of autistic disorder, without a delay in language and cognitive development. Children with AS are typically diagnosed in later childhood (Macintosh & Dissanayake, 2004). The later diagnosis may be partially explained by the presence of good language and often outstanding intellectual abilities, which can mask deficiencies in social development and cognitive flexibility (Frith, 2004).

Among the social impairments documented in AS are mentalizing problems (e.g., Baron-Cohen, Jolliffe, Mortimore, & Robertson, 1997; Baron-Cohen, O'Riordan, Stone, Jones, & Plaisted, 1999; Castelli, Frith, Happé, & Frith, 2002; Happé, 1994; Heavey, Phillips, Baron-Cohen, & Rutter, 2000; Kleinman, Marciano, & Ault, 2001; Rutherford, Baron-Cohen, & Wheelwright, 2002). However, these impairments typically only involve difficulties with second-order-, but not first-order-, mental state attribution (Baron-Cohen, 1989; Ziatas, Durkin, & Pratt, 1998).

Face processing is one area of social cognition that has recently received much attention by autism researchers (see Grelotti, Gauthier, & Schultz, 2002, for a review). Faces hold a wealth of information about the identity

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of the person and their group membership. Even if of neutral expression, they give vital cues to the initiation or avoidance of social contact, and appropriate mode of approach. A variety of impairments in face processing have been revealed specifically in people with high-functioning autism or AS.

Some of these impairments involve mentalizing. For example, individuals with AS or high-functioning autism are poor at predicting the intentions or mental states of others from pictures of their eyes (Baron-Cohen et al., 1997; Baron-Cohen, Wheelwright, Hill, Raste, & Plumb, 2001). However, there are also impairments that are likely to be of separate origin. Thus, there are problems in face recognition memory (Blair, Frith, Smith, Abell, & Cipolotti, 2002) and emotional expression understanding (Hobson, 1993). Additionally, the scan path of eye gaze when looking at faces can give clues as to the origin of these problems. Individuals with autistic disorder have been shown to have a preference for attending to the mouth region of the face when the bias in normal development is for the eyes (Joseph & Tanaka, 2003; Klin, Jones, Schultz, Volkmar, & Cohen, 2002). If they avoid looking at the eyes, they would therefore miss important communicative signals conveyed by the eye regions, such as emotional expression.

Emotional responsiveness and emotion regulation are also areas where impairments have been noted (Hill, Berthoz, & Frith, 2004; Shamay-Tsoory, Tomer, Yaniv, & Aharon-Peretz, 2002). However, many aspects of social cognition, such as implicit imitation of action, empathy for others' feelings, and the use of speech and gesture in two-way communication, still remain to be investigated in people with AS. It seems possible that in view of their varied clinical picture, which can include milder forms with more subtle impairments, some aspects of social knowledge may show preserved functioning. Certainly, there is ample biographical evidence that adults with AS can be highly skilled at learning and applying social rules (e.g., Gerland, 1997; Lawson, 1998; Sainsbury, 2000), and in autistic disorders in general there is evidence of successful teaching of social skills (e.g., Silver & Oakes, 2001).

One aspect of social cognition, the ability to use social stereotypes, has as yet hardly been studied in autism-spectrum disorders, although it has been a major focus of research in traditional social psychology. Stereotypes allow us to categorise people we have never met before, thus simplifying and organising social information. For example, we are prepared to give a preliminary judgement as to whether a person is attractive, trustworthy, or has high social status from minimal visual cues. Knowledge of stereotypes is thought to be culturally transmitted and typically emerges from about the age of 3 years (Hirschfeld, 1996). Importantly, stereotyping allows us to prepare for potential social interaction by making predictions about a person's behaviour on the basis of their group membership (Mackie, Hamilton, Susskind, & Rosselli, 1996). Stereotypes therefore may help us to decide from a photograph whether we may wish to avoid or to meet an unfamiliar person independently of what that person is like as an individual.

One of the first neuropsychological studies to exploit the ability to make quick judgments of people on the basis of photographs was carried out by Adolphs, Tranel, and Damasio (1998). They showed a set of 100 faces to three patients with bilateral amygdala damage and asked them to rate on a 7-point scale, either approachability (how much they wanted to walk up to a person and strike up a conversation with them) or, in another session, trustworthiness (how much they would trust that person with all their money or with their life). Since the attribution of these characteristics to photographs is subjective, the authors established a reference sample of 46 undergraduates to rate this set of faces and used these ratings as a standard against which to compare the ratings of the patients. They found that the patients rated the 50 most negative faces more positively compared to ratings given by the control sample, and also by 10 patients with other types of brain damage. This was true for both trustworthiness and approachability, whereas they gave similarly positive ratings to the faces that the control sample judged as the 50 most positive.

Adolphs, Sears, and Piven (2001) used the same task with individuals with AS and found that these individuals performed similarly to the amygdala patients, also judging the 50 most untrustworthy faces as more trustworthy than controls while rating the most trustworthy ones equally positively. However, somewhat surprisingly, they performed as well as controls in their judgment of approachability. Adolphs and colleagues concluded that individuals with AS, like patients with bilateral amygdala lesions, show less ability to discriminate faces in terms of subjectively perceived trustworthiness with a bias towards strong positive ratings in some individuals.

Just what perceptual information we use from the photographs to make these judgements is not clear, but the attribution of social traits such as trustworthiness and approachability is likely to draw on social knowledge, specifically, on culturally acquired knowledge about stereotypes. There are a number of reasons to think that this is likely to be an area of difficulty in AS. First, if some basic perceptual aspects of face processing are impaired or at least abnormal in individuals with AS, this may prove a disadvantage in acquiring such knowledge. Second, if a degree of mentalizing impairment is present, then individuals with AS would be expected to be less able to acquire knowledge of stereotypes, given that this knowledge is socially transmitted.

Bearing in mind the mixed results from the Adolphs et al. (2001) study, we explored further dimensions of important social stereotypes using their paradigm of judging faces. In particular, we wished to explore the dimensions of attractiveness and social status, but we also included trustworthiness to replicate the findings from their original study.

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