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Social Cognition: Overturning Stereotypes of and with Autism

New data suggest that even children with autism are subject to race and gender stereotypes. This result constrains theories of stereotype acquisition and social cognition in autism.

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Stereotypes about the characteristics of individuals based on their group membership, for example race or gender, are a pernicious feature of human society. A prejudiced image of a woman struggling with a math test or a black man as a threat has no basis in reality, but almost everyone in American and European cultures is subject to these stereotypes. Once acquired, such stereotypes are remarkably robust and difficult to overcome (for review, see [1]), despite their unpleasant impact on human social interactions.

There is, however, one group of individuals who one might think would be immune to the influence of stereotypes. Children with autism have profound difficulties with many types of social interaction. They do not orient towards social stimuli [2] and show reduced social behaviour even before the diagnosis of autism can be made [3]. These children fail to engage others by means of joint attention [2] or imitation [4] and have trouble recognising faces [5]. Cognitive studies have revealed

that autistic children have specific difficulties with understanding other people's mental states [6], and this 'Theory of Mind' deficit is a core feature of autism. The broad impairment of social cognition in autism might be expected to reduce the autistic child's capacity for learning social information, such as how to treat members of other racial groups, from other people's behaviour. Thus, children with autism should surely be impervious to the detrimental influence of race and gender stereotypes.

In a study published recently in *Current Biology*, Hirschfeld and colleagues [7] used a simple test of children's tendency to stereotype to compare children with autism and their matched typical peers. Surprisingly, the autistic children demonstrated a clear propensity to make judgements based on race and gender stereotypes, just like typical children. Contrary to the naïve prediction, it seems that children with autism do use social stereotypes. Moreover, when children were tested on a novel 'conflict' task which pitted the explicitly stated desires of the characters ('Mary likes playing with trucks') against the implicit

stereotypical preference ('girls don't like trucks'), both typical seven year olds and children with autism who passed theory of mind tasks made more judgements based on the character's desires than on stereotypes. In contrast, both typical three year olds and autistic children who failed theory of mind tasks continued to use stereotypes to predict behaviour in the conflict task. These results imply that theory of mind abilities may be important not for acquiring stereotypes, but for overcoming them. Again, the similarity between the typical and autistic groups suggests that stereotype use is not dysfunctional in autism.

These data bring together two fields of social cognition which have not previously interacted, and have interesting implications for both. First, the question of how the autistic child acquires stereotypes is now critical. In order to form a stereotype, a child must be able to classify the people they see as members of a particular social group based on visual features and must then link the group to particular unobserved character traits, which can be attractive (friendly, strong), or unattractive (stupid, ugly). Typical children acquire these abilities early, with awareness of gender roles at age 26 months [8] and the use of racial stereotypes from age 3 years [9]. But the sources of information which children draw on to make links between social groups and

positive or negative attributes are less clear.

Explicit teaching about race or gender does not seem to play a major role, because carefully devised school programs which aim to reduce stereotyping rarely have an impact [10]. Neither can race stereotypes arise from direct experience of the world or from basic associative learning, because the stereotype of a black child as unkind has no basis in reality. In fact, more contact with individuals of different races tends to reduce stereotypes [10]. Indirect influences such as television [11] and adult or community beliefs [12] have been cited as sources of stereotypes, but the evidence is largely correlational. The finding that children with autism also acquire stereotypes, presumably by the same mechanism as typical children, further constrains the possible mechanisms. Specifically, it suggests that stereotype acquisition can proceed without social engagement or a fully functioning theory of mind.

Second, Hirschfeld *et al.*'s [7] findings have implications for advancing our understanding of the nature of autism itself. Autism is commonly seen as a global social disability, with impairments in all aspects of social interaction, including perceptual [5], emotional [13], cognitive [6] and motor [4] social abilities. Theoretical explanations of autism have tended to focus on these disabilities. The present data adds to a small but growing body of literature suggesting that individuals with autism also have specific strengths where they match or even out-perform typical individuals. These islets of ability encompass not only 'savant' skills, such as calculating the day of the week for every calendar day for thousands of years [14], and perceptual skills such as arranging blocks to match a pattern [15], but also judgements of the attractiveness and trustworthiness of individuals from photographs [16], which may be similar in origin to stereotypes. While it may seem odd to celebrate stereotyping as a social

ability, the social abilities present in children with autism provide potential for teaching the other skills that these children find difficult. Further studies of social abilities in autism, to complement the larger literature on disabilities, will illuminate the complexities and subtleties of this condition, as well as providing important clues to its cognitive origins.

Finally, the finding of intact stereotypes in autism has implications for broader ideas about social cognition. In particular, it suggests that there is no single 'social brain' which is uniformly damaged or spared. Rather, there may be many different cognitive and neural systems for different types of social interaction. Delineating these different systems will be an important area for future study. Some researchers have suggested that the brain may have modular systems for specific social processes, for example a 'theory of mind' module [6] and even a 'theory of race' module [17], though the evidence for such modules remains equivocal. Alternatively, divisions could be drawn between automatic, implicit use of stereotypes [18], and more controlled or effortful understanding of mental states [19]. Finally, theorists might differentiate between brain systems for long term, stable character traits such as intelligence, which are often subject to stereotypes, and short term, changeable mental states such as a desire for a glass of water or a belief that the tap is broken [20]. Understanding how to parse the social brain, and knowing which components are impaired or spared in different atypical populations, may provide a defining step in developing the field of social neuroscience to its full potential. The results of Hirschfeld *et al.* [7] provide a starting point for this endeavour.

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