

Case Study – Baron Cohen

Info:

Simon Baron-Cohen is a professor of developmental psychopathology in the departments of psychiatry and experimental psychology, a Fellow of Trinity College, Cambridge, and director of the Autism Research Centre at the University of Cambridge, in the United Kingdom.^[1] He is best known for his work on autism, including his early theory that autism involves degrees of 'mindblindness' (or delays in the development of theory of mind), and his later theory that autism is an extreme form of the 'male brain', which involved a reconceptualization of typical psychological sex differences in terms of empathy and systemizing.

Baron-Cohen published "Does the autistic child have a 'theory of mind'?" in 1985 with autism researchers Uta Frith and Alan Leslie.^[2] It proposed that children with autism show social and communication difficulties as a result of a delay in the development of a theory of mind.

In his 1995 book *Mindblindness* (MIT Press), he suggested that an individual's theory of mind depends on a set of brain mechanisms that develop in early childhood, including the eye direction detector (EDD), the shared attention mechanism (SAM), and the intentionality detector (ID). Baron-Cohen singled out SAM as a key precursor to theory of mind, giving rise to the Checklist for Autism in Toddlers (CHAT).^[3]

Baron-Cohen's theory, outlined in his 2003 book *The Essential Difference* (Penguin/Basic Books), attempted to link the fields of typical sex differences in psychology with the field of autism. He proposed that on average, females develop faster in empathy and on average males develop faster in systemizing. People with autism, he argued, show an extreme of the typical male profile in having a disability in empathy alongside intact or even superior systemizing.

In his 2005 book *Sex Differences in MIND* (MIT Press), Baron-Cohen demonstrated that foetal testosterone (FT) levels (measured in the amniotic fluid) inversely predict social behaviour (e.g., eye contact at 12 months), language development (e.g., vocabulary size at 24 months), quality of social relationships at 4 years, and empathy at 8 years. FT levels also positively predict systemizing at 8 years. A single biological mechanism (FT) thus appears to influence both empathy and systemizing, in opposite ways. He is testing if autism is associated with elevated FT.

In addition to basic research into the biomedical causes of autism, Baron-Cohen and his colleagues have produced practical tools for people with autism, including *Mindreading: An Interactive Game for Children with Autism*,^[4] which is educational software for helping to improve emotion-

recognition skills. More recently, he created ~~the WISC-R~~ ^{the WISC-R},^[5] a children's animation series. The series superimposed real human faces showing emotions onto animated vehicles, as a way of harnessing the strong interest in systems (vehicles being an example of a system) that even preschoolers with autism show, to help make faces and emotional expressions more autism-friendly and predictable.

Baron-Cohen has also done research on synesthesia, a neurological disorder involving the "crossing" of sensory wiring in the mind.

Aim:

The Aim of this experiment was to see if high functioning individuals with autism/AS do process a theory of mind. This experiment was devised because Baron-Cohen wanted to see a difference between adults and children with autistic spectrum disorders.

Method:

Group 1: Participants with autism/AS normal intelligence, 13 males and 3 females.

Group 2: 50 normal adults, age matched.

Group 3: Participants with Tourette syndrome, age matched 8 males and 2 females.

The Eyes Task

The eyes task comprises photographs of the eye region of 25 different faces (male and female). The photos were taken from magazines and standardized: same size (15 x 10), all black and white and the entire same region (from midway along the nose to just above the eyebrow).

Each picture was shown for three seconds and participants were given a forced choice question – they had to select between two mental state terms printed under each picture. These mental state terms were either "basic" mental states (such as sad or afraid) or more "complex" (such as reflective, arrogant, scheming etc). The Two terms of each photo were one mental state term and its "foil", i.e. a term with the opposite meaning – for example "concerned" and "unconcerned" or "friendly" and "hostile". The full list is given on the next page.

Conclusion:

The results of the study seem to provide evidence of ToM deficits in adults with autism or AS. Contrary to previous research with adults. One criticism might be that eyes task is not measuring ToM. However this can be countered.

- The target words are mental state terms.
- The terms are not just referring emotions but refer to mental states.
- The pattern of performance on the Eyes task was mirrored in the pattern of performance of strange stories task, providing current validity.
- The performance on the eyes task was not mirrored in the performance on the two control tasks, suggesting that poor performance was not due to using eyes as stimuli, or to difficulties extracting social information from minimal cues, or to subtle perceptual deficits or to lack of basic information recognition.

Finally it should be noted that some of the autism/AS group hold university degrees which suggests that this aspect of social ability is independent of general intelligence.

Evaluation:

This experiment carried many strengths and weaknesses. The method was experimental and was laboratory conducted therefore made it considerably easy to control the variables as it was also a quasi experiment which is an advantage of studying natural occurring conditions. However, this could have had a knock on effect on the experiment and created eco validity in some areas as the factors could be controlled a bit too much.