

Another advanced test of theory of mind: evidence from very high-functionality adults with autism or Asperger Syndrome

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Introduction / Background

Adults with autistic spectrum disorders have problems with social relationships. Research using 1st order Theory of Mind (TOM) tasks has found that children diagnosed as autistic are not able to reason what another person is thinking (example of 1st order TOM task is the 'Sally Ann' test). Normal children develop the ability to 'read minds' by the age of 6 but the Sally Ann test is not appropriate for adults.

The aim of the study was to find out why adults with autistic spectrum disorders have problems with social relationships and to develop an advanced test for theory of mind in adults with Autism.

The hypothesis

That adults with Asperger Syndrome (autism) can't interpret states of mind from 'reading eyes'.

Method

Natural experiment having matched participant design. 3 groups of participants: 16 autistic (Asperger), 13 male, 3 female; 50 normal, 25 male, 25 female; 10 Tourette's patients, 8 male, 2 female; matched on age and normal intelligence. *The 2 clinical groups had passed 1st order TOM tests at 6-year-old level.*

IV = Normal, Autistic, Tourette's Syndrome

DV = performance on eye task (maximum score = 25)

The 'eye task' procedure

25 photos of eyes, each 15 x 10cm black and white, were each shown for 3 seconds. Participants, tested individually, were asked a forced-choice question:

Example: Which word best describes what this person is thinking or feeling?



Reflective or Unreflective

The TARGET is the correct answer and as a control was presented randomised on both left and right.

The 'eye task' was created by selecting magazine photos, and 4 judges generated the target words e.g. TARGET= calm, FOIL = anxious. The TARGET is the correct answer, the FOIL is the opposite.

Controls

When generating targets and foils the eye photos were shown to a panel of 8 adults who did not know there was a 'right or wrong' answer and there was 100% agreement with TARGET.

Control tasks

(i) Gender identification: all participants asked to identify the GENDER of each of the 25 eye photos (ii) Basic emotion task: all participants asked to identify the emotion in full-face photos, happy, sad, angry, afraid, surprise, disgust (*Ekman categories*).

Results

The Autistic adults were less likely to identify the Target foil than the Normal or Tourette's group. At a significance level of $p < 0.0001$ Normal and Tourette's better than Autistic.

Eye Task	Autistic	Normal	Tourette's
Mean	16.3	20.3	20.4
Range	10	9	9
Identify gender?	24.1	23.3	23.7

Results

Females were better at reading minds from eyes than Males. At a significance level of $p < 0.0001$ Normal Females better than Males.

Eye Task	Normal (m)	Normal (f)
Mean	18.8	21.8
Range	6	5
Identify gender?	24	23.3

Conclusion

(i) There is evidence for subtle 'mindreading' deficits in intelligent adults on the Autistic spectrum.

(ii) The eye task is a 'pure theory of mind test' for adults because there is NO context (does not require an understanding of what the person whose eyes are shown is 'doing').

Extra pics



Which word best describes what this person is thinking or feeling?

Serious or playful

Examples of forced-choice 'eye task' question

TARGET	FOIL
attraction	worried
friendly	hostile
calm	anxious