Efficiency during information transfer between autistic and neurotypical people

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Background

Social cognition refers to behaviours thought to be necessary for successful interactions with others.

Most social cognition research in autism focuses on apparent deficits on traditional laboratory tasks, which in theory underpin difficulties in real-world interactions with others.

If social cognition is impaired in autism, interactions between two autistic people should be especially challenging.

Despite this, autistic people often highlight feelings of comfort and unique aways of engaging with others in exclusively-autistic company.

This research

In this research, we investigate whether performance on information transmission tasks varies depending on the diagnostic status of a social partner.

We address the possibility that autistic people might have strengths in social interactive behaviours that are particularly beneficial when interacting with other autistic people.

We adapted a cultural learning paradigm used widely in comparative psychology to explore transmission of information between individuals, contrasting autistic, neurotypical, and mixed neurotypical/autistic pairs.

Method

9 Research Days each involving 8 participants, that were either all autistic (n=24), all neurotypical (n=24), or mixed autistic/neurotypical (n=24), matched for age and gender.

Information was shared using a diffusion chain technique, a controlled, experimental form of "Telephone". The researcher initially told a story with 30 details to the first person in the chain, who was then paired with the next person in the chain and instructed to tell the story to them, who then passed it on to the next individual, and so on.

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We found that that both autistic and neurotypical people benefit from having an interaction partner with the same diagnostic status when performing an information transfer task.

1. Autistic people share information with other autistic people as effectively as non-autistic people do

2. Information sharing breaks down when pairs are mis-matched: from different neurotype

Results

Chains of autistic and neurotypical people shared similar amounts of information, but mixed chains alternating between autistic and non-autistic people shared and passed on less information (Fig 1). Multiple regression analysis tested whether type of chain and position in chain predicted the amount of information passed on, and found these two variables account for 84% of the variance (R^2= 0.84, $F(5,66) = 77.05$, $p<0.0001$). Being in a mixed chain significantly predicted score (B=-6.04, $p<0.0001$) though being in either the autistic or neurotypicals did not (B=0.13, p=0.93), indicating that these groups shared a similar amount of information.

Crucially, an interaction between chain type and chain position indicates that the mixed chain followed a significantly steeper decline in number of details remembered (B=0.57, $p<0.05$). **Even when controlling for the amount of information shared by the first person in each chain and therefore partialling out the effect of the first person in the mixed chain sharing less information, the mixed chain still shared proportionally less information than the autistic and neurotypical chains** (Fig.2). Regression of chain type and score (R^2= 0.87, $F(5,66) = 94.50$, $p<0.0001$) showed being in the mixed group significantly predicted the proportion of details recalled (B=-11.41, $p <0.05$), though no significant effect of being in the neurotypical or autistic groups (B=5.66, p =0.32).

Figure 1: Mean number of story details passed through the diffusion chain by autistic, neurotypical, and mixed groups

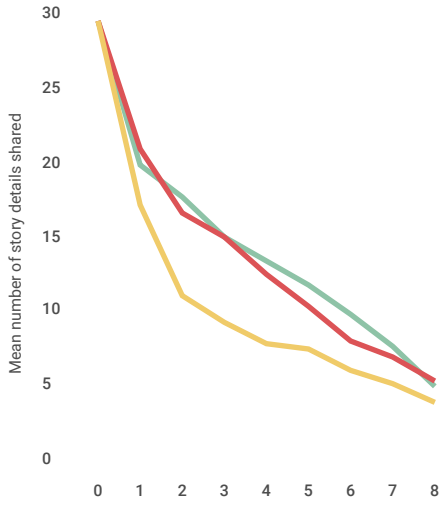
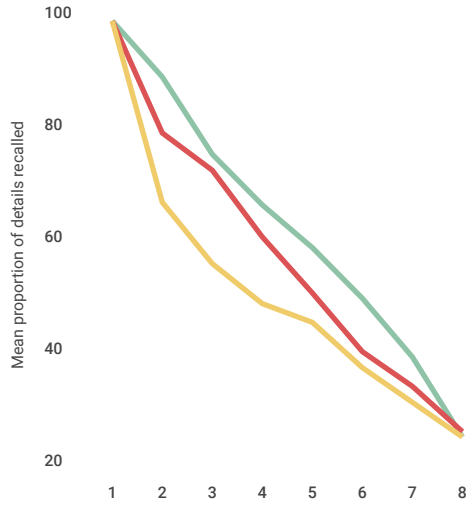


Figure 2: Mean proportion of the first participant in each chains' details recalled by autistic, neurotypical, and mixed groups



Participants

Groups were matched by age, gender, years of education and IQ as assessed by the Wechsler Abbreviated Scale of Intelligence [1] (Table 1). Chains were ordered by increasing age, and had minimal gender switches. All neurotypical participants scored below 32 on the AQ [2]. All autistic participants had a clinical diagnosis, or self-identified and scored above 72 on the RAADS-R [3]

Table 1: Mean (SD) of key demographic variables for each of the groups.

	Autistic	Neurotypical	Mixed
Age	37.33(13.13)	37.92(14.39)	35.25(10.76)
Gender	F=18, M=3, NB =3	F=21, M = 3	F=18, M = 6
Y/Education	17.44 (2.8)	17.83 (1.52)	17.12 (1.98)
WASI IQ	114.42(16.89)	115.04 (11.78)	117.79(13.62)

Theorised explanations

This finding provides some support to the Double Empathy Theory: a theoretical framework which emphasises a mismatch between autistic and non-autistic social partners, rather than a social cognitive deficit within the autistic person [4].

Implications & Future work

In essence, what we are demonstrating for the first time is that autistic people's social behaviour includes effective communication in direct violation of the diagnostic criteria for autism.

We are in the process of coding performance on two other tasks using the diffusion chain method to explore whether a similar pattern of findings emerge.

Participants rated rapport with their diffusion chain partners, so we are coding that to explore whether self rated interactional rapport differs depending on matched/mismatched diagnostic status

Videos are also being coded to investigate objective markers of interactional rapport

Future work may work on replicating this finding in other tasks and with other groups (e.g. with children), and on related questions, such as

How do autistic people from different cultures (nationalities, ethnicities) relate to each other?

Does autistic identity transcend international borders?

What are the implications of this research for other psychiatric and neurodevelopmental conditions?

Get in touch

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References

[1] Wechsler, D. (2011). WASI-II: Wechsler abbreviated scale of Intelligence. PsychCorp. [2] Baron-Cohen, S.et al (2001). The autism-spectrum quotient (AQ): Evidence from asperger syndrome/high-functioning autism, males and females, scientists and mathematicians. Journal of autism and developmental disorders, JADD 31, 5-17. [3] Ritvo RA et al. (2011). The Ritvo Autism Asperger Diagnostic Scale-Revised (RAADS-R): a scale to assist the diagnosis of autism spectrum disorder in adults: an international validation study. *JADD, 41*, 1076-1089. [4] Milton, D. E. (2012). On the ontological status of autism: the 'double empathy problem'. *Disability & Society, 27*(6), 883-887.