

Briefing paper

Self-reported sex differences in high-functioning adults with autism: a meta-analysis.

R.L. Moseley, R. Hitchiner, and J.A. Kirkby, *Molecular Autism*, 2018, 9:33.

Sex differences in autistic symptomology are believed to contribute towards the late or missed diagnosis of many girls and women with an autism spectrum condition (ASC). Females with more severe autistic symptoms alongside intellectual disability are likely to be diagnosed in childhood, whereas those without intellectual disability and with subtler presentations are more likely to be diagnosed in adulthood. Previous studies have found that sex differences become more apparent with age, and despite their less obvious presentation, autistic girls seem to struggle as much as autistic boys with social understanding. Despite this, research has shown that the expressive social behaviours of autistic girls tend to out pass their male peers, and they are less likely to engage in the stereotypical repetitive behaviours normally associated with autism, such as a fascination with small parts. The review of the literature shows that scholarship has concentrated on sex differences in children with autism, whereas studies aiming to recognise sex differences in autistic adults are limited. This research consisted of a meta-analysis of RAADS-R data in order to identify main effects of Sex and Diagnosis and for interactions between these factors in a sample of autistic and non-autistic adults.

Outline of research

The aim of the research was to expand upon current studies on differences of autism symptoms in men and women. The chosen method was an established screening test employed in South West England: the Ritvo Autism Asperger Diagnostic Scale-Revised (RAADS-R), an 80 item questionnaire filled in by the participants. The questionnaire is designed to be filled in with clinical assistance and is intended as part of a comprehensive assessment rather than a stand-alone diagnostic instrument, but is recommended by the National Institute of Health and Care Excellence (NICE) as a screening tool. Supplementary data was pooled from participating researchers who also used RAADS-R by searching 3 online databases (Web of Science, PubMed, and Science Direct) and Google Scholar. Datasets from 3 relevant studies were added to the existing data in order to construct a meta-analysis. The research investigated ratings made by autistic and typically-developing adults in the following 4 domains:

- Social relatedness
- Circumscribed interests
- Language
- Sensorimotor abnormalities

Those who scored particularly high on RAADS-R were removed as they were considered as potentially undiagnosed with autism. Software was used to reduce the number of typically developed females by selecting those best matched in age to other groups. The final numbers of participants in the study were as follows:

- 118 autistic men
- 137 typically-developing men
- 136 autistic women
- 136 typically-developing women

Each item on the questionnaire was scored in order of its emergence and current occurrence, meaning whether the participant was experiencing an effect only in adulthood, both in childhood and adulthood, or only in childhood. The scores were reversed when the responses were presented in negative terms. For each domain, separate two-way Analyses of variance (ANOVAs) included between-subjects factors of Diagnosis (autistic vs. typically-developing) and Sex (female vs. male). Once the data was collected and prepared, it was examined in order to explore the interactions between diagnostics and sex, and whether sex differences were attenuated or increased by the presence of an autism diagnosis.



Read the full paper here:

<https://molecularautism.biomedcentral.com/articles/10.1186/s13229-018-0216-6>

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Key findings and impact

Results from this study were presented under the 4 domains listed in the RAADS-R model:

- **Social relatedness:** The results showed that both men and women diagnosed with autism had significantly higher prevalence of social problems than typically-developing adults. Therefore a diagnostic difference was spotted here, but not in sex.
- **Circumscribed interests:** The data showed a main effect of diagnosis: that typically-developing men and women had much lower rates of circumscribed interests, a key symptom of autism. Despite a main effect of sex reflecting a general tendency for men to report more symptomatology in this domain, there was a lack of differences between autistic men and women.
- **Language:** Women generally reported fewer autistic language symptoms than men, such as problems understanding metaphors and non-literal language. A significant interaction between Sex and Diagnosis, revealed that scores differed significantly between typically-developing men and women but not between autistic men and women.
- **Sensorimotor:** The highest scores in this domain were seen in autistic women, followed by autistic men, typically-developing women, and then typically-developing men. Diagnosed women reported disproportionately more sensorimotor symptoms than diagnosed men. Sex and diagnostic differences were spotted here.

The results of this research, the lack of differences seen between autistic men and women in social relatedness, circumscribed interests and language, could be interpreted in line with a theoretical perspective that links ASC with masculinisation of brain and behaviour. Further research is needed to know whether these findings reflect a genuine equalisation of childhood difference. However, the authors questioned whether this self-report screening tool lacks refinement to pick up the sex differences in language, repetitive behaviour and social skills that have been reported in other studies and anecdotal reports. It is still unknown whether autism is genuinely more prevalent in males or whether a diagnostic bottleneck means that autistic girls and women are less often detected; if this screening test is insensitive to the differences in autistic females reported by other research, it may fail to detect those who show the less stereotypical, more masculine presentation. This research highlights the importance of studying the female autistic phenotype due to the suffering caused by late or missed diagnosis. The one domain where autistic women and men differed, the sensorimotor domain, is worthy of further research attention.

Conclusion

The data from meta-analysis revealed that autistic women did not statistically differ from autistic men in self-reported symptomatology in domains related to social relatedness, language and circumscribed interests, but this should be ratified by objective methods. Furthermore, the results show higher scores in sensorimotor symptoms in autistic women, which is of potential clinical relevance considering the downplaying of this domain in diagnostics instruments and criteria. This research highlights the need for more research into how women perform in the range of androcentric autism diagnostic screening tools and diagnostic measures.



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