MISS ASD: A NEW SCREENING INSTRUMENT FOR WOMEN WITH ASD

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Background

The diagnosis for ASD is mainly based on the male ASD phenotype. Consequently, women with ASD are often misdiagnosed or diagnosed much later in life. A screening instrument taking into account the **female ASD phenotype** could aid in the identification of women who may have undiagnosed ASD.

Typical for a female ASD phenotype is a higher social motivation, better non-verbal communication, more camouflaging techniques, gender specific preoccupations, and more sensory issues.

The **AQ** (Autism-spectrum Quotient, Baron-Cohen et al., 2001), an often-used ASD screening instrument, is based on the extreme male brain theory. The AQ does not specifically take into account the female ASD phenotype.

We developed the **M-ASD** (Miss-ASD; Bezemer & Blijd-Hoogewys, 2016), an ASD screening instrument that does take into account the female ASD phenotype. It includes 120 items derived from extensive literature search on female ASD expressions, clinical impressions of the authors, and data analysis aimed at sex differences in adults with ASD on other questionnaires (N=200 AQ, N=90 SRS-A, N=250 BRIEF-A).

Based on theoretical grounds, the M-ASD has 6 subscales: 1) Social interaction and communication (34 items), 2) Rigidity (34 items), 3) Coping, compensation and camouflaging behavior (18 items), 4) Sensory issues (15 items), 5) Information processing (10 items), and 6) Miscellaneous (9 items).

Objectives

The goal of this research is the development, validation and standardization of a new screening instrument, the M-ASD, which takes into account the female ASD-phenotype. The ultimate goal is to ameliorate the identification of ASD in women.

Methods

There were **118 participants with ASD** (60 men, 58 women; $M = 36.07$, $SD = 13.03$ year), diagnosed by trained clinicians. Their estimated intelligence, based on education, is average to superior.

All participants completed the AQ and the M-ASD. For both, dichotomous scoring was applied, with a maximum score of 50 for AQ and 120 for M-ASD.

Table 1: M-ASD and AQ scores for women and men

	Women $M (SD)$ (n = 58)	Men $M (SD)$ (n = 60)	Difference in % of total range	p-value (t-test)	Effect size Cohen's d
M-ASD					
Total score	71.10 (21.03)	58.30 (22.34)	11%	0.002*	0.59
Social interaction & communication	21.40 (7.08)	17.73 (7.85)	11%	0.009*	0.49
Rigidity	19.95 (6.28)	17.53 (6.80)	7%	0.048	0.37
Coping, compensation & camouflaging	10.36 (3.93)	8.15 (3.63)	12%	0.002*	0.58
Sensory issues	9.40 (3.07)	6.70 (3.78)	18%	<0.001*	0.78
Information processing	6.19 (2.39)	5.05 (2.03)	11%	0.006*	0.51
Miscellaneous	3.81 (1.93)	3.13 (2.19)	8%	0.078	0.33
AQ					
Total score	30.38 (8.85)	27.35 (7.54)	6%	0.047	0.37
Social skill	5.86 (2.63)	4.95 (2.27)	9%	0.045	0.37
Attention switching	7.53 (2.24)	6.93 (2.27)	6%	0.150	0.27
Attention to details	5.47 (2.39)	5.13 (2.34)	3%	0.447	0.14
Communication	5.91 (1.97)	4.77 (2.31)	11%	0.004*	0.53
Imagination	5.00 (2.28)	5.07 (2.19)	1%	0.872	-0.03

Difference women vs men

* Significant t-tests after correction for multiple testing (Bonferroni-Holm correction)

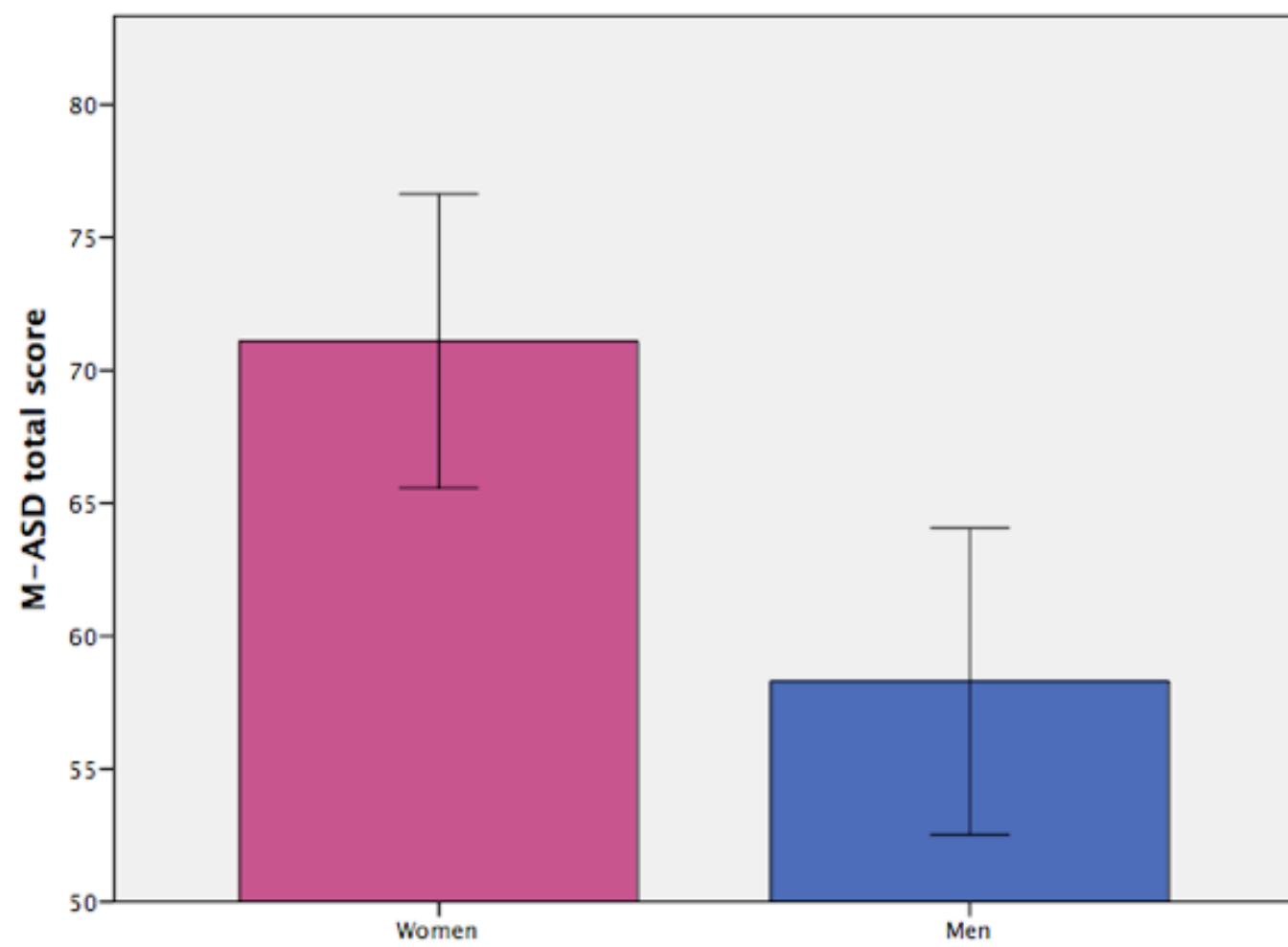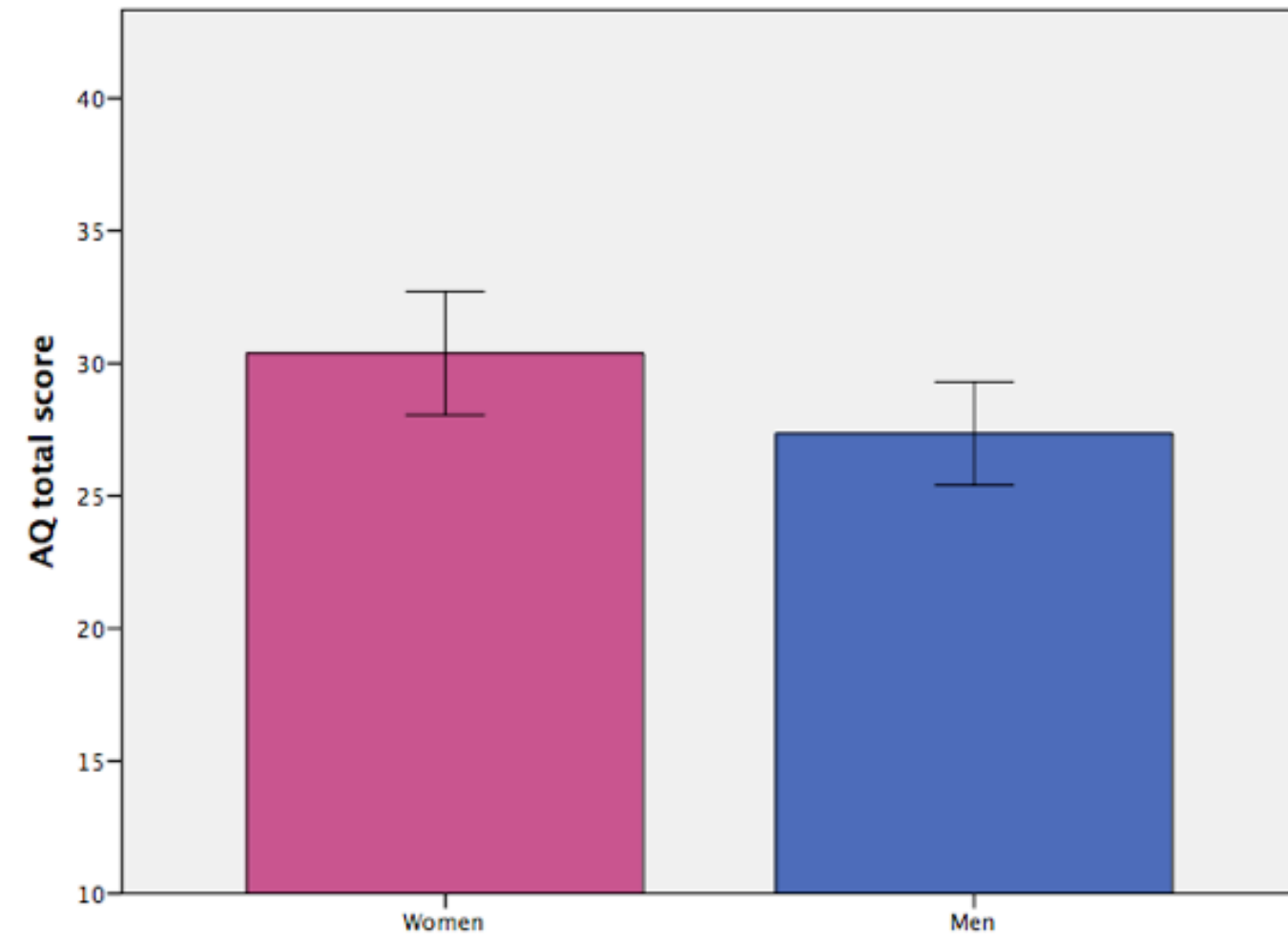Figure 1: M-ASD total scores over sex

Figure 2: AQ total scores over sex

Results

Women with ASD have significantly higher mean scores than men with ASD (see Table 1, Figure 1 & 2). They report more problems, on both the M-ASD total score (11%) and four of the M-ASD subscales, namely 'Sensory issues' (18%), 'Coping, compensation and camouflaging behavior' (12%), 'Social interaction and communication' (11%) and 'Information processing' (11%), but on only one of the AQ subscales, namely 'Communication' (11%). All have medium effect sizes.

There is a **high correlation** between AQ and M-ASD ($r = .71$, $p < .001$).

Item analysis shows that some items are characteristic for ASD in general (with equal confirmatory answers by women and men) and other **items more specific for women with ASD**. For example, a M-ASD item for ASD in general is *I find it difficult to start a conversation and/or keep it going* and a M-ASD item specific for women with ASD is *I'm tired after social interaction*.

Conclusions

The M-ASD seems to be **suitable in measuring ASD characteristics** in general; the correlation with the AQ is high.

The M-ASD seems to be better than the AQ to **capture the female autism phenotype**; women have higher scores than men on almost all the M-ASD subscales. The significant subscales match the presumed characteristics for women with ASD (i.e. better camouflaging techniques and more sensory issues).

Follow-up research is planned, aimed at shortening the M-ASD and focusing on validation and standardization of this **promising new screening tool**.

References

Baron-Cohen, S., Wheelwright, S., Skinner, R., Martin, J., & Clubley, E. (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, 31(1),* 5-17.

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