The Predictive Value of AQ and SRS-A in adults with suspected ASD

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Background

The **Autism Spectrum Quotient** (AQ; Baron-Cohen et al., 2001, via open source) and the **Social Responsiveness Scale for Adults** (SRS-A; Constantino & Todd, 2005, via paid source) measure the degree to which adults with a normal intelligence exhibit autistic traits. In the Netherlands, both questionnaires are often used as **screeners** in the assessment of adults with suspected ASD. Their diagnostic value depends on their capability to properly assess the likelihood that the disorder is present (sensitivity: true positives) or not (specificity: true negatives).

In former research, we have proven the AQ to be moderately valuable for ASD case identification in a general mental health care population (Bezemer & Blijd-Hoogewys, 2016). Comparing the predictive value of AQ and SRS-A, in the same ASD assessment procedure, has not been done.

Objectives

The aim was to compare the predictive value of the AQ and the SRS-A for ASD diagnostic classification in a general mental health care population with suspected ASD.

Methods

At INTER-PSY, a general mental health care in the Netherlands, adult patients, who were **referred for ASD assessment**, filled in both an AQ and a SRS-A self-report at the beginning of the diagnostic process.

An **independent researcher** scored the questionnaires. The results remained unknown to the clinician and the patient until after the ASD diagnosis was officially confirmed or rejected, resulting in an ASD-group and a non-ASD group. In doing so, the results of the questionnaires cannot play any role in the diagnostic conclusion (blind).

ASD diagnostic was based on an extensive psychiatric examination, a standardized ASD interview, and a developmental interview with (one of the) parents in the presence of the patient.

In total, there were **92 participants** (M = 33.51 years, SD = 12.33), of which 68% received an ASD diagnosis. The ASD and non-ASD group did not differ on important characteristics, such as age (M = 33.68 vs. M = 33.14) and gender ratio (1.3:1 vs.1.4:1) (see Table 1).

For analyses, AQ raw scores and SRS-A T-scores were used. Descriptive statistics, correlations, T-tests and ROC-analyses were performed.

Table 1 *Descriptives of participants*

	ASD (n = 63)	**Non-ASD (n = 29)**
Sex: M / F	36 (57%) / 27 (43%)	17 (58%) / 12 (42%)
Age *M* (*SD*)	33.68 (12.40)	33.14 (12.30)

Table 2 *Total score and subscale scores of AQ and SRS-A (ASD vs. non-ASD)*

	ASD (n = 63) *M (SD)*	**Non-ASD (n = 29)** *M (SD)*	**Effect size** (Cohen's d)	**AUC value** (CI 95%)
AQ total	29.17 (7.75)**	20.97 (8.13)	1.03	.78 (.68-.88)
Subscales:				
- Social	6.70 (2.19)**	3.86 (2.72)	1.29	.78 (.68-.89)
- Attention switching	7.10 (2.43)*	5.66 (2.79)	0.55	.65 (.53-.77)
- Local details	5.48 (2.62)*	4.14 (2.34)	0.54	.66 (.54-.78)
- Communication	5.38 (2.22)**	3.45 (2.16)	0.88	.74 (.63-.85)
- Imagination	4.52 (2.14)*	3.86 (2.15)	0.31	.59 (.47-.72)
SRS-A total	70.87 (10.76)*	63.59 (12.56)	0.62	.69 (.56-.81)
Subscales:				
- Social awareness	66.44 (11.68)*	60.59 (12.80)	0.48	.64 (.51- .76)
- Social communication	70.56 (9.93)*	63.83 (12.36)	0.60	.66 (.53-.78)
- Social motivation	70.17 (11.20)**	62.59 (12.26)	0.65	.68 (.56-.80)
- Restricted interests & repetitive behavior	68.78 (13.85)	63.24 (14.71)	0.39	.62 (.50-.75)

**Significant difference ASD vs. non-ASD, p < 0.05*
***Significant difference ASD vs. non-ASD, p < .01 (correction for multiple testing 0.05/11= 0.0045)*

Figure 1: ROC of AQ total score

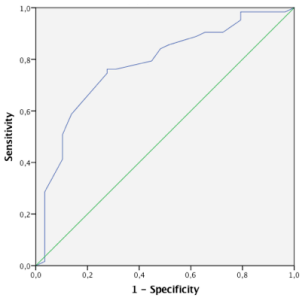
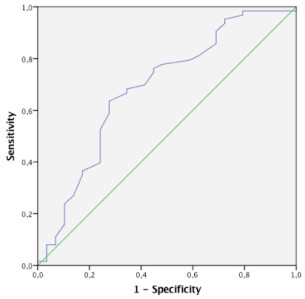


Figure 2: ROC of SRS-A total score



Results

The **ASD group had significant higher scores** than the non-ASD group on both the AQ (M = 29.17, SD = 7.75; M = 20.97, SD = 8.13 respectively; t = 4.65, df = 90, p < .001, Cohen's d = 1.03) and SRS-A (M = 70.87, SD = 10.76; M = 63.59, SD = 12.56 respectively; t = 2.86, df = 90, p < .01, Cohen's d = 0.62) (see Table 2).

The **correlation between both questionnaires** was high (r = .80, p < .001).

The **ROC-analysis** for the **AQ** yielded an AUC of .78 (p < .001) for ASD vs. non-ASD. A cut-off total score of 26 is recommended for screening use by Woodbury-Smith and colleagues (2005). This cut-off was also determined by the best Youden's Index in this research. In that case, the AQ had a sensitivity of .76 and a specificity of .72 for ASD (see Figure 1).

The **ROC analysis** for the **SRS-A** yielded an AUC of .69 (p < .01) for ASD vs. non-ASD. A cut-off T-score of 70 (determined by the best Youden's Index) had a sensitivity of .63 and a specificity of .72 for ASD (see Figure 2).

Conclusions

Both questionnaires could differentiate between the ASD and the non-ASD group. However, the **AQ** had a **higher effect size** than the SRS-A (large vs. medium), a **better predictive reliability** (moderate vs. poor) and a **higher sensitivity**.

Based on the current results, the **AQ seems to be superior as a screening tool** for general mental health care patients with suspected ASD. However, replication studies are needed before advising which one to use for clinical practice. Also, note that questionnaires are not intended to be diagnostic in itself. If there are clinically significant levels of autistic traits, a comprehensive diagnostic evaluation is warranted.

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*, 5-17.

Bezemer, M., & Blijd-Hoogewys, E.M.A. (2016). The value of the AQ in outpatient mental health service. *IMFAR Poster presentation*, Baltimore.

Constantino, J.N., & Todd, R.D. (2005). Intergenerational transmission of subthreshold autistic traits in the general population. *Biological Psychiatry, 57*, 655–660.

Woodbury-Smith, M. R., Robinson, J., Wheelwright, S., & Baron-Cohen, S. (2005). Screening adults for Asperger syndrome using the AQ: A preliminary study of its diagnostic validity in clinical practice. *Journal of Autism and Developmental Disorders, 35*, 331-335.

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