Psychometric Properties of the M-ASD Questionnaire

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Background

ASD manifestations

- Under-recognition and misdiagnosis of ASD, due to more elusive manifestations, most in female, also in male (Hull et al., 2020).
- Diagnostic delay ~7 years (Haney, 2016).
- Timelier identification could lead to better prognosis, prevent secondary problems, reduce family stress and decrease societal costs (Garcia-Primo et al., 2014).
- M-ASD questionnaire (50 items): considers more elusive ASD manifestations.

Objectives: Validate M-ASD in clinical and general population.

Methods

Retrospective diagnostic data (clinical groups)

- *N* = 1260 adults suspected of having ASD (see Table 1)
- ASD diagnostic assessment, incl. M-ASD, AQ-50 and BRIEF-A
- 63,4% received ASD diagnosis (clinical ASD group, 62% women), remaining received another or no psychiatric diagnosis (clinical non-ASD group, 62% women)
- Subgroup did M-ASD retest (n = 68; max = 2-8 weeks interval)

Retrospective diagnostic data (control group)

- N= 181 adults from general population (see Table 1, 84% women)
- M-ASD and AQ-10

Analyses

- M-ASD (range 0-150; continuous item-scoring); AQ-50 scores (range 0-50; dichotomous item-scoring)
- Internal consistency: Cronbach's *a*
- Construct validity: Pearson's *r* (convergent and divergent validity); T-tests
- Criterion validity: ROC (sensitivity, specificity, PPV & NPV)
- Test-retest reliability: Pearson's *r*

Table 1: Descriptive statistics

Group		M-ASD	AQ	Age	
	n	***M (SD)***	***M (SD)***	***M (SD)***	**Min - Max**
Clinical ASD	799	78.53 (26.64)	29.53 (7.26)	32.73 (11.74)	18.05 – 64.75
Clinical non-ASD	461	55.64 (25.72)	22.91 (7.49)	33.97 (12.02)	18.03 – 65.30
Control	181	13.04 (9.93)		41.82 (11.42)	22.00 – 65.00

Table 2: M-ASD total score group comparisons

Group	*p*-value	Cohen's *d*
Clinical ASD vs non-ASD	<.001	0.870
Clinical ASD vs Control	<.001	2.679
Clinical non-ASD vs Control	<.001	1.899

Table 3: M-ASD total score Receiver Operating Curves

Group	*AUC*	*p*-value	Cut-off
Clinical ASD vs non-ASD	.734	<.001	>73.91
Clinical ASD vs Control	.989	<.001	>39

Results

Reliability & validity of M-ASD

- Internal consistency: Cronbach's *a* = .955
- Test-retest reliability: *r* = .917, CI (95%) = .868 - .948
- Correlation with AQ: *r* = .760, *p* <.001, CI (95%) = .736 - .782
- Correlation with BRIEF-A (Organization of Materials): *r* = .194, *p* <.001, CI (95%) = .135 - .252
- Correlation with BRIEF-A (Task Monitor): *r* = .282, *p* <.001, CI (95%) = .225 - .337
- ASD > non-ASD > Control group (see Table 2, large - very large ES)

Sensitivity & specificity of M-ASD

- Clinical ASD vs Non-ASD (see Table 3 & Figure 1)
  - Sensitivity = 59% & Specificity = 79%
  - PPV: 83% & NPV: 52%
- Clinical ASD vs Control (see Table 3 & Figure 2)
  - Sensitivity = 93% & Specificity = 100%
  - PPV = 100% & NPV = 75%

Figure 1: ROC M-ASD total score Clinical ASD vs Clinical Non-ASD

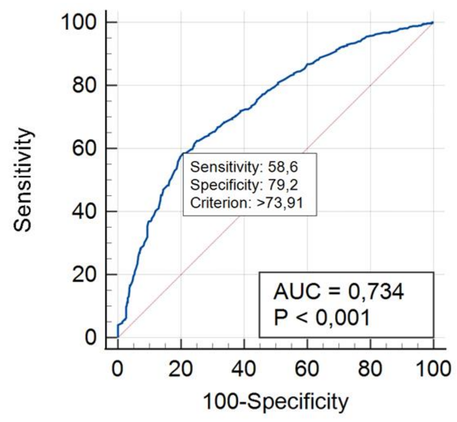
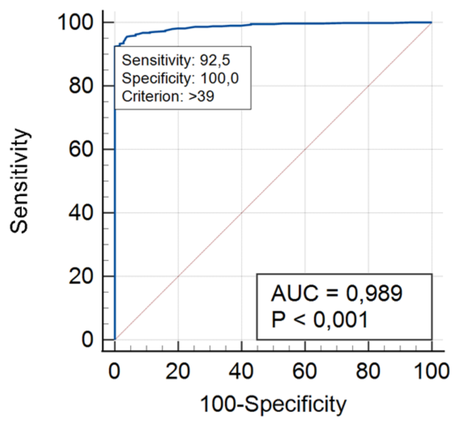


Figure 2: ROC M-ASD total score Clinical ASD vs Control group



Conclusions

M-ASD has good psychometric qualities

- Excellent internal consistency & test-retest reliability
- Strong convergent & divergent validity
- Good criterion validity

Critical note

- Still 48% of ASD classifications were missed in the clinical group
- Diagnosis should never be based on a questionnaire
- Relative higher age and percentage of women in control group

Clinical implications

- The M-ASD is useful as a screening tool for detecting individuals with ASD, with distinct cut-offs for general population and clinical setting
- The M-ASD is open source available for clinical use via: https://www.fann-autisme.nl/informatie/producten/m-asd/

References

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