

Concurrent Validity of the Brief Observation of Symptoms of Autism (BOSA)

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Background

- The Autism Diagnostic Observation Schedule, 2nd Edition, is considered the “gold standard” measure for diagnosis of autism spectrum disorder (ASD).
- COVID-19 presented challenges with use of the ADOS-2, which cannot be validly administered with masks.
- The Brief Observation of Symptoms of Autism (BOSA) was developed for use with pandemic-friendly procedures (Lord et al., 2020).
- BOSA activities and coding procedures were derived from the ADOS-2 and the Brief Observation of Social Communication Change (BOSCC; Grzadzinski et al., 2016).
- The BOSA was widely adopted for clinical and research programs, though there is limited research to evaluate its validity.
- The BOSA showed good interrater and cross site reliability, and convergent validity with the ADOS-2 Toddler Module and Module 3 (Dow et al., 2021).

Methods

Participants

	Overall Sample	Children (i.e. Those Receiving Module 3)		Adolescents/Adults (i.e. Those Receiving Module 4)	
		BOSA Recipients	ADOS-2 Recipients	BOSA Recipients	ADOS-2 Recipients
		N	190 (143 male)	14 (12 male)	91 (65 male)
Age	17.55 (7.79)	10.51 (2.33)	11.34 (2.56)	24.90 (6.75)	20.89 (6.15)
FSIQ	103.59 (18.52)	106.50 (17.79)	101.33 (19.11)	106.69 (15.57)	106.63 (20.24)

** Some participants received multiple measures at different timepoints and are thus counted in more than one category

Measures

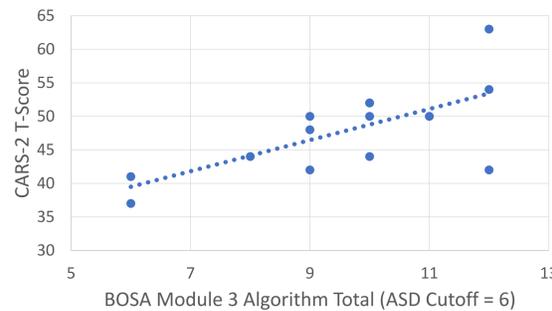
- Autism Diagnostic Observation Schedule, 2nd Edition (ADOS-2)
- Brief Observation of Symptoms of Autism (BOSA)
- Social Responsiveness Scale-2nd Edition (SRS-2)
- Child and adolescent participants received:
 - Autism Diagnostic Interview-Revised (ADI-R)
 - Vineland Adaptive Behavior Scales-3rd Edition (Vineland-3)
- Participants receiving the BOSA were also administered the Childhood Autism Rating Scale-2nd Edition (CARS-2)

Procedure

- 190 participants with an existing diagnosis of ASD were administered the ADOS-2 Module 3 or 4 (pre-pandemic, without mask restrictions) and/or the BOSA Module F1 or F2 (coded on ADOS-2 Module 3 or 4).
- Participants were administered additional social communication measures listed above.
- ADOS-2, BOSA, and ADI-R were administered by research reliable clinicians.

Results

Correlation Between BOSA Module 3 Algorithm Total and CARS-2 T-Score



Correlation Between BOSA Module 4 Algorithm Total and CARS-2 T-Score

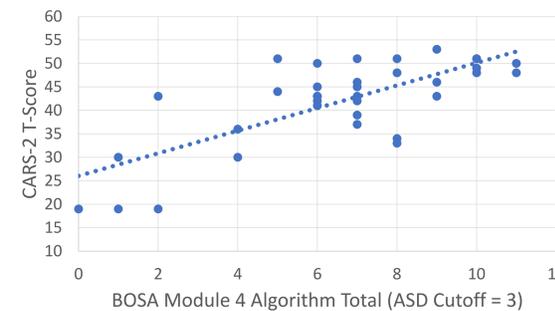
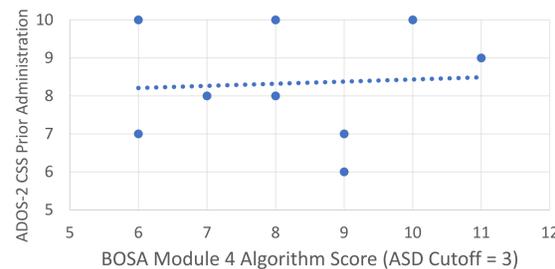


Figure 1. The BOSA Algorithm Total Score correlated significantly with the CARS-2 T-Score for both BOSA Modules 3 ($r(12)=.68$, $p=.008$) and 4 ($r(34)=.74$, $p<.001$).

		Correlations							
		SRS-2 Total Raw Score	ADI-R Social Reciprocity	ADI-R Communication	ADI-R RRBs	Vineland-3 ABC	Vineland-3 Communication	Vineland-3 Daily Living	Vineland-3 Socialization
ADOS-2 CSS	Pearson Correlation	-0.017	.210*	.254**	0.048	-0.115	-.152	-0.062	-.171
	N	147	110	110	110	111	113	113	113
BOSA Module 3 Algorithm Total	Pearson Correlation	0.385	0.367	0.150	-0.111	-0.169	-0.182	-0.476	0.048
	N	14	14	14	14	13	13	13	13
BOSA Module 4 Algorithm Total	Pearson Correlation	0.032	0.224	0.258	-0.647	-0.229	-0.437	0.080	-0.351
	N	32	8	8	8	8	8	8	8

Table 1. The BOSA Algorithm Total Score did not correlate significantly with the SRS-2 or with any domains of the ADI-R or Vineland-3 for either BOSA Module 3 or 4. In contrast, the ADOS-2 CSS correlated significantly with the Reciprocal Social Interaction and Communication domains of the ADI-R. (**Correlation is significant at the 0.01 level; *Correlation is significant at the 0.05 level.)

Correlation Between BOSA Module 4 and Prior ADOS-2 CSS



Correlation Between ADOS-2 CSS Scores Across Two Timepoints

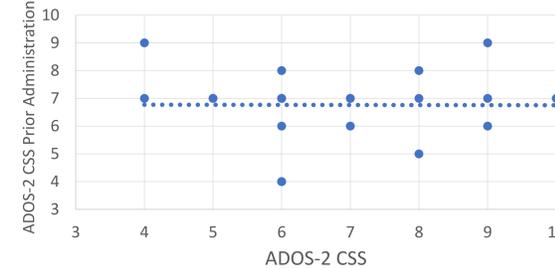


Figure 2. The BOSA Module 4 Total Algorithm Score did not correlate significantly with the ADOS-2 CSS administered at a previous timepoint ($r(7)=.07$, n.s.; average time between administrations: 52.88 months). Notably, the ADOS-2 CSS also did not correlate significantly with the CSS from a previously administered ADOS-2 ($r(19)=-.004$, n.s.; average time between administrations: 52.56 months).

Conclusions

- The BOSA showed concurrent validity with another clinician-rated measure (CARS-2) but not with parent- or self-report measures of social communication.
 - In contrast, the ADOS-2 exhibited concurrent validity with two domains of the ADI-R.
- Counter to predictions, neither the BOSA nor the ADOS-2 correlated with prior ADOS-2 administration.
 - Results are limited by a small sample size.
 - May also be related to the amount of time elapsed between administrations.
- The BOSA holds promise as a brief measure of ASD-related symptoms but may not be as robust a clinical measure as the ADOS-2.
- Additional research is needed to expand on these findings:
 - Replicate with a larger sample size.
 - Expand validity investigation to other BOSA modules.
 - Revisit once a cross-module BOSA score is available.

References

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