Observational Measure of Restricted & Repetitive Behaviors in Children with Autism Spectrum Disorder

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ABSTRACT

The present study extended measurement of restricted and repetitive behaviors in children with ASD to naturalistic contexts by adapting a widely used parent-report instrument, the Repetitive Behavior Scale-Revised (Bodfish et al., 2000), for use as an observational tool. A diverse sample of 26 children ages 4 to 11 with an ASD diagnosis attended a laboratory visit with their primary caregiver. The frequency of RRBs was observed during parent-child interaction tasks, including a dyadic free play and a problem-solving activity. Current findings provide preliminary psychometric support for the RBS-O as a means of indexing important ASD symptoms.

INTRODUCTION

Restricted and repetitive behaviors (RRBs) are core symptoms of autism spectrum disorder, and the frequency and intensity of these behaviors may underlie important differences in social functioning and outcomes for children with ASD. To date, measurement of RRBs has largely been limited to report measures or to observation during formal diagnostic batteries (e.g., Leekam et al., 2011). The present study sought to extend measurement of RRBs to more naturalistic contexts by adapting a widely used parent-report questionnaire, the Repetitive Behavior Scale-Revised (Bodfish et al., 2000), for use as an observational tool to measure children's RRBs during parent-child interaction.

Recent DSM-5 diagnostic changes reflect an increased emphasis on documenting the presence of multiple types of RRBs. However, opportunities for observing RRBs can be limited in the context of clinical and research evaluations, even when employing direct assessments designed to press or pull for RRBs (e.g., Mazefsky et al. 2013). The development of a flexible observational tool that can be used across environments and interaction partners therefore has significant potential to enhance systematic assessment of RRBs, which may help to inform research and clinical treatment.

PRIMARY RESEARCH AIM

The present study examined the preliminary psychometrics of the RBS-O, an observational adaptation of the original RBS-R. Inter-rater reliability and consistency across tasks were evaluated. Criterion-related validity evidence was also examined by comparing observational ratings with scores from standardized assessments of ASD symptoms and intellectual functioning, as well as measures of physical arm movements.

METHOD

Participants

- N = 26 children (21 boys) ages 4 to 11 (M = 6.84, SD = 1.77) with a community diagnosis of ASD and their primary caregiver
- Annual household income M = $50,000 - $70,000
- Children's racial/ethnic background: 44% Caucasian, 36% Hispanic, 4% Asian, 12% African American, 4% Other

Procedures

- The laboratory visit included two parent-child interaction tasks, a 4-minute free play interaction and a 5-minute problem-solving puzzle task, as well as direct assessments of the child.

Measures

- **Repetitive Behavior Scale-Observation (RBS-O).** The RBS-O was developed for this study as an adaptation of the RBS-R (Bodfish et al., 2000). The RBS-R is a 43-item parent-report instrument that measures the frequency, intensity, and impact of six categories of RRBs: 1) stereotyped behavior (e.g., repetitive motor mannerisms, sensory interests/aversions), 2) self-injurious behaviors, 3) compulsive behaviors (e.g., ordering, checking), 4) ritualistic behaviors (e.g., repetitive questioning, routines during play), 5) insistence on sameness, and 6) restricted behaviors (e.g., restricted interests, preoccupation with parts of objects).

  In developing the RBS-O, the structure of the RBS-R was retained, but 5 items related to daily activities not possible to observe in a laboratory setting were eliminated (mealtime, sleeping, self-care, transportation, and preference for routine with music/movies). Observers with significant experience in ASD separately rated the frequency and intensity of the remaining types of repetitive behaviors using a 3-point scale (0 = no occurrence / low intensity, 3 = more than five occurrences / high intensity). Frequency and intensity ratings for observed RRBs were summed to create overall scores. Total RRB Frequency was the primary focus of the current investigation.

- **Autism Diagnostic Observation Schedule-2 (ADOS-2; Lord et al., 2012).** The ADOS-2 was administered to provide a direct assessment of children's ASD-related symptoms. The ADOS-2 social affect, restricted and repetitive behavior, and comparison scores were utilized.

- **Affectiva Q-Sensor.** A wireless *Q-Sensor* worn on the child's right wrist recorded children's physical arm movements during the free play and problem solving tasks using a triaxis accelerometer. Movement data were averaged across the free play and problems solving tasks to provide a proxy for stereotyped motor movements.

- **Stanford-Binet 5 Abbreviated Battery IQ (ABIQ; Roid, 2003)**. The ABIQ was used as an estimate of children's general intellectual functioning.

RESULTS

Inter-rater Reliability

- Results revealed a high level of inter-rater reliability for the RBS-O (RRB Frequency ICC = .94; RRB Intensity ICC = .93).

Consistency Across Tasks

- Reliability was further supported through consistency in the RRB frequency scores across the parent-child free play and problem-solving tasks, r = .72, p < .001

Criterion-Related Validity Evidence

	RBS-O Frequency Across Tasks	RBS-O Frequency Free Play	RBS-O Frequency Problem Solving
ADOS-2 Social Affect	.62**	.58**	.60**
ADOS-2 RRB	.70***	.69**	.59**
ADOS-2 Comparison Score	.46*	.48*	.42*
Physical Arm Movements	.46*	.59**	.43*
SB5 Abbreviated Battery IQ	-.45*	-.31	-.53*

***p < .001; **p < .01; *p < .05

CONCLUSIONS

- **Findings provide preliminary reliability and validity evidence for the RBS-O as a method of examining restricted and repetitive behaviors in children with ASD during naturalistic parent-child interaction.**

- **The RBS-O appears to hold promise as a flexible observational tool that could be implemented for both research and clinical purposes, including use in initial screening or diagnostic evaluations and for tracking RRBs over time.**

- **Next steps include evaluating the RBS-O across additional settings and interaction partners as well as item-level examination in order to facilitate a fine-grained analysis of contextual influences upon manifestation of RRBs.**