Repetitive Behavior in Toddlers with Down syndrome

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INTRODUCTION

- Repetitive Behaviors (RBs) include repetitive motor movements, restricted interests, ritualized behaviors, self-injurious behaviors, insistence on sameness, and nonfunctional routines (APA, 2013; Wolff et al., 2016)
- RBs are common in early childhood, but persistent engagement in RBs is a diagnostic criterion for neurodevelopmental conditions, such as autism spectrum disorder (ASD; Leekam et al., 2011).
- Children with Down syndrome (DS) engage in more RBs throughout childhood than children without DS (Evans et al., 2014).
- Children with DS have an elevated likelihood of co-occurring ASD (Diguiseppi et al., 2010; Oxelgren et al., 2017).
- Some of the earliest caregiver observed behaviors for later co-occurring ASD diagnoses were stereotypic repetitive behaviors in children with DS (Spinazzi et al., 2024).
- Little is known about the range of presentation of RBs in toddlerhood in DS or how RB may serve as a diagnostic indicator of co-occurring ASD in DS.

STUDY GOALS

To describe the range of RBs observed in a cohort of 1-year old children with DS and evaluate whether specific RB profiles are detectable during this early stage of development.

METHODS

Participants were 83 one-year old children with DS (range 17.38-24.74 mos; M = 20.59 mos) with mental ages between 4.33 – 20.00 months (M = 11.56) measured on the Bayley-4 Scales of Infant and Toddler Development (Bayley & Aylward, 2019).

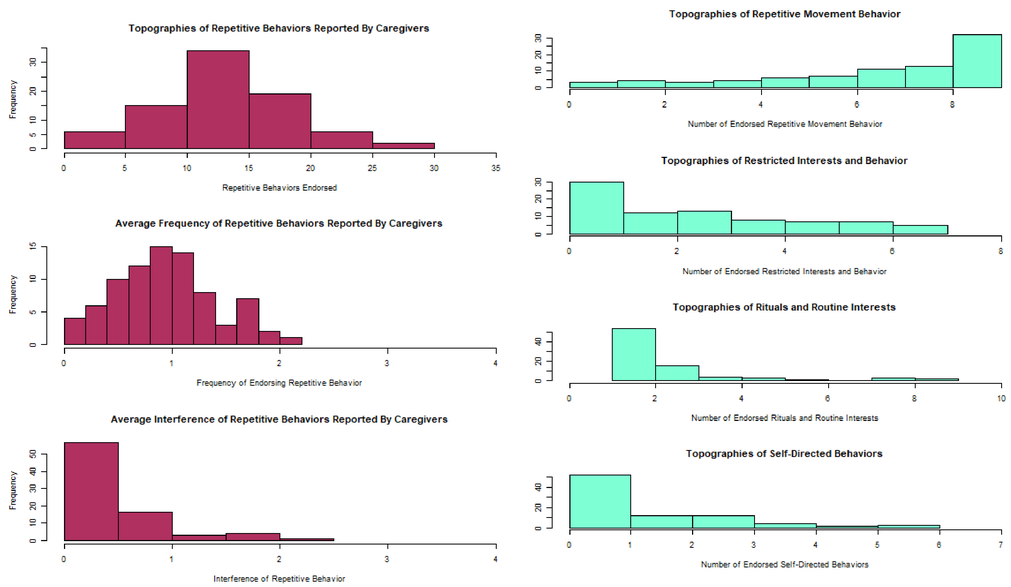
Caregivers completed The Repetitive Behavior Scales – Early Childhood (RBS-EC; Wolff et al., 2016), a 34-item questionnaire covering repetitive behavior across 4 domains:

- Repetitive Motor Movements (9 Questions)
- Restricted Interests and Behavior (8 Questions)
- Rituals and Routine Interests (10 Questions)
- Self-directed Behavior (7 Questions)

3 Types of scores were calculated from the RBS-EC:

- Frequency = Average score calculated for each subdomain (0 – behavior does not occur, 1 – behavior occurs weekly or less, 2- behavior occurs several times a week, 3 – behavior occurs about daily, and 4 – behavior occurs many times per day).
- Topographies = Total number of repetitive behaviors endorsed by caregivers when they rated frequency as greater than 0.
- Interference = Rated for each domain and averaged for a composite interference score ("How often do behaviors interfere with other activities or interactions?" 0- Never to 4 – Always).

Figure 1. Endorsed Repetitive Behaviors by score and domain



RESULTS

A range of repetitive behaviors were observed in toddlers with DS. Out of a possible 34 topographies, this sample endorsed an average of 13.66 repetitive behaviors, but wide variability was observed (2-29; Table 1).

Repetitive motor movements (6.94 out of 9) was the most endorsed repetitive behavior, and the least reported was self-directed behavior (1.46 out of 7).

A significant positive correlation was observed such that higher interference scores were associated with a greater number of repetitive behaviors ($r = .544$, $p < .001$).

Table 1. Average Scores Reported for Topographies, Frequency, and Interference by Domain

RBS-EC Domain	**Topographies Endorsed** Mean (Range)	**Frequency Rating** Mean (Range)	**Interference Rating** Mean (Range)
Repetitive Motor Movements	6.94 (0-9)	2.34 (0-4)	0.74 (0-3)
Restricted Interests and Behavior	2.7 (0-7)	0.67 (0-2.5)	0.33 (0-2)
Rituals and Routine Interests	2.47 (1-9)	0.26 (0-1.6)	0.27 (0-3)
Self-directed Behavior	1.46 (0-6)	0.4 (0-3.43)	0.35 (0-3)
Composite Scores	13.66 (2-29)	0.95 (0.03 – 2.09)	0.43 (0-2.25)

CONCLUSION

One year old children with DS in this sample demonstrated a range of RB presentations. In each of the four RB domains, scores had variability across the range of possible responses.

Response variability was also observed in the composite scores for frequency of RBs and interference. However, scores across the full range of the measure were not observed at this age in DS.

A next step for investigation will examine profiles of RB across subdomains. Auxiliary analyses will examine the how profiles are associated with other developmental characteristics of participants.

This early heterogeneity of RBs may indicate differential developmental trajectories that could inform detection of ASD in children with DS in future work.

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