Title: Reliability of Parent Report Measures of Executive Functioning in Children with Down Syndrome

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Introduction: Challenges with executive functioning are common in children with Down syndrome (DS). Neuropsychological assessments are often used to assess executive functioning in children with DS, but may not capture the day-to-day presentation of challenges with executive functioning. To address this, parent- and teacher-report forms have been developed for typically developing children, but have not been fully evaluated for children with DS (Esbensen et al., 2017). Some current research is adopting use of preschool rating scales and evaluating scores based on the child’s mental, not chronological, age (D’Ardhuy et al., 2015; Daughnauer et al., 2014; Lee et al., 2011). A limitation of this approach is variability and accuracy in measuring mental age and ceiling effects when used with adults (D’Ardhuy et al., 2015). The current study evaluates the psychometric properties of the Behavior Rating Inventory of Executive Function (BRIEF) with children with DS using scoring based on their chronological age.

Method: In this retrospective study, caregivers of 84 children with DS rated their child’s behavior with the BRIEF (48 from community research studies, 36 from clinical chart review). BRIEF teacher ratings were obtained for 57 of these children (67%). Children with DS were between 6 and 18 years old ($M = 11.36$ years, $SD = 3.00$), were primarily male (60.7%) and Caucasian (84.5%). The study investigated psychometric properties of the BRIEF among school-age children with DS, including an assessment of the rate of detecting challenges with executive functioning, concerns with distribution, internal consistency, inter-rater reliability, and appropriateness of the normative data conversion.

Results: About 40% of children with DS were reported by parents, and 70% by teachers, to exhibit clinically significant challenges with executive functioning (i.e., T-score 1.5 standard deviations above the mean on the BRIEF Global Executive Composite). Distribution of scores was not a concern, with skew and kurtosis within acceptable limits. Internal consistency for subscales was poor to primarily excellent for both parent (.67 - .96) and teacher (.76 - .97) forms, and inter-rater reliability was generally excellent (.38 - .67, $p < .05$). Normative data conversions controlled for age, IQ and gender differences in this sample, with some exceptions. Females were reported to have more concerns with parent reports of planning ($t[68] = -2.61, p = .01$) and teacher reports of inhibitory control, organizing materials, and task-monitoring ($t[55] = -2.39, p = .02$; $t[55] = -2.35, p = .02$; $t[55] = -2.96, p = .00$). Older children in this sample demonstrated more concerns with parent-reports of monitoring ($r = .22, p = .04$), and teacher-reports of shifting, initiating, and task-monitoring ($r = .31, p = .01$; $r = .35, p = .01$; $r = .31, p = .02$). Children in this sample with IQ scores above the median split (IQ = 43) demonstrated more concerns with teacher-reports of organizing materials ($t[54] = -2.26, p = .03$).

Discussion: Consistent with prior studies, we found that a significant number of children with DS evidence executive dysfunction. Difficulties are seen in multiple settings, thus raising concern for pervasive functional impact. The study findings suggest that the BRIEF subscale and index scores generally performed in a psychometrically sound manner among children with DS. The BRIEF can be used as a screening measure when evaluating challenges with executive functioning among school-age children with DS, without needing to adopt scoring for mental age on the BRIEF-Preschool version.

References/Citations: