Title: Parent Behavior and Executive Function in Children with Down Syndrome

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Introduction: Executive function (EF) refers to the set of cognitive skills required to complete goal directed behaviors (Müller & Kerns, 2015). EF skill development has been shown to be associated with specific parenting behaviors in previous research on typically developing (TD) children (Hammond, Müller, Carpendale, Bibok, & Liebermann-Finestone, 2012). The study of EF development in Down syndrome (DS) and its relation to parenting is of particular interest because EF is an area of challenge for individuals with DS (Daunhauer & Fidler, 2011). The current study examines parent behaviors in DS and TD dyads and their association with everyday EF skills in the child. Refining what we know about the association between parent behaviors and EF has the potential to influence future EF interventions in DS and other developmental disabilities.

Method: Participants were 25 children with DS (mean nonverbal mental age (NVMA)=47.96 months; mean chronological age (CA)=95.84 months) and 19 TD children (mean NVMA=49.56; mean CA=38.84) and a parent or primary caregiver. Child participants were matched on NVMA using the Leiter-R (Roid & Miller, 1997). Parents completed the Behavior Rating Inventory of Executive Function-Preschool (BRIEF-P) (Gioia, Espy, & Isquith, 2003), an ecological measure of EF. Parent-child dyads also participated in the Parent-Child Challenge Task (Lunkenheimer, 2009), a five-minute collaborative puzzle activity, to assess behaviors of both the parent and child during a challenging problem-solving task. Parent behaviors of interest included teaching and directive behaviors. Child behaviors were coded for instances of compliance and noncompliance. Trained coders naïve to the study questions coded the Parent-Child Challenge Task and demonstrated an average inter-rater reliability of 73%.

Results: Parents of children with DS used significantly more teaching, $t(42) = 2.55$, $p \leq .05$, and directive behaviors, $t(42) = 3.71$, $p \leq .05$, when compared to TD dyads across the five-minute interaction period. The total number of parent behaviors observed was significantly negatively correlated with child NVMA for the DS dyads, $r(22) = -.72$, $p < .001$, and TD dyads, $r(16) = -.48$, $p < .05$. In DS dyads, teaching behavior was found to be significantly negatively correlated with the Inhibitory Self-Control Index raw score of the BRIEF-P, $r(19) = -.43$, $p < .05$, and was approaching significance on the global EF raw score of the BRIEF-P, $r(19) = -.40$, $p = .07$. Higher BRIEF-P scores, indicating weaker EF skills, were associated with lower frequency of teaching behaviors. However, this correlation was not observed in TD children.

Discussion: These preliminary data reveal differences in rates of specific parent behaviors when comparing NVMA-matched DS and TD dyads during a problem-solving task. The greater frequency of total teaching and directive parent behaviors in DS dyads highlights the modifications parents use when interacting with their child with DS, especially in relation to child NVMA. In DS there is also a relationship observed between parent teaching behaviors during the problem-solving task and child EF skills, and specifically inhibition. Although the directionality of these associations cannot be established with the present cross-sectional study design, this study provides an initial foundation for studies of EF and parenting in DS. Future longitudinal work should examine the directionality of the association between parent behaviors and child EF development over time in DS to inform intervention.

References/Citations: