**Title**: Exploring the association between eating behaviors and restricted and repetitive behaviors in young autistic children

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**Introduction**: Challenging eating behaviors among autistic children are highly prevalent (Mayes & Zickgraf, 2019). These eating behaviors are often associated with negative health consequences, including obesity, eating disorders, and malnutrition. Many factors are implicated as mechanisms underlying these eating behaviors (e.g., executive function, sensory preferences, restricted and repetitive behaviors and interests [RRBIs]), which makes it difficult to develop appropriate treatment targets. While RRBIs are a core diagnostic criterion for autism, research regarding the relationship between RRBIs and eating behaviors is mixed (for review, see Page et al., 2021). Many of these mixed findings may be due to differences in how challenging eating behaviors are defined and measured (e.g., eating behaviors quantified by number of foods eaten and / or one parent report item). Since there are many types of eating behaviors observed in autism (e.g., food selectivity, food refusal, selective overeating) and heterogeneity in eating behavior presentation (Nadeau et al., 2021) we need to understand how different types of eating behaviors relate to RRBIs. Therefore, this exploratory study aimed to understand the relationship between domains of eating behaviors and RRBIs.

**Method**: Our sample was drawn from two studies. One study is a clinical trial focused on supporting behavioral flexibility in autism, and the other study focused on challenging eating behaviors in autism. Both samples included autistic children between three to nine years of age (*M*=72.72, *SD*=27.30 months; 22.7% female), for a total sample of 39 children. The two studies obtained parent report measures, including the Behavioral Pediatric Feeding Assessment Scale (BPFAS) and the Restricted and Repetitive Behavior Scale-Revised (RBS-R), as well as questions related to the child’s cognitive and verbal ability. Domain scores for the BPFAS (i.e., Mealtime Behavior, Medical / Motor behavior, and Food Acceptance based on Allen et al., 2015 scoring) and the RBS-R (i.e., Stereotyped, Self-injurious, Compulsive, Ritualistic / Sameness, and Restricted Interests behaviors) were merged for analysis. We used partial correlations to explore the relationship between BPFAS and RBS-R domains. While we anticipated controlling for parent-reported cognitive ability, there was a significant amount of missing data. Instead, we controlled for parent-reported child verbal ability since research suggests there are higher rates of RRBIs in minimally verbal autistic children (Harrop et al., 2021).

**Results**: Partial correlation results suggested that the BPFAS Medical / Oral Motor subdomain was significantly associated with Stereotyped (*r*=0.40, *p*=0.01), Compulsive (*r*=0.56, *p*<0.001), Ritualistic (*r*=0.37, *p*=0.02), and Restricted Interest (*r*=0.37, *p*=0.02) behaviors. The Food Acceptance subdomain was only significantly associated with Restricted Interests (*r*=0.40, *p*=0.01), and the Mealtime Behavior subdomain was also only associated with Compulsive behavior (*r*=0.32, *p*=0.04).

**Discussion:** This exploratory study provides preliminary evidence on the relationship between multiple domains of eating behavior and RRBIs, continuing to point to the complexity and heterogeneity of eating behaviors. While all three domains of eating behaviors were related to at least one RRBI domain, the Medical / Motor subdomain was related to all RRBI subdomains, except for Self-Injurious behaviors. This means that the Medical / Motor aspects of eating (e.g., choking or gagging; poor appetite; letting food sit in mouth) relate to both higher and lower order RRBIs, and this type of eating behavior may be more complex for treatment. Interestingly, the Food Acceptance and Mealtime Behavior domains were only related to higher order types of RRBIs (i.e., Restricted Interests / Insistence on Sameness Compulsive,) and may mean interventions for these eating behaviors should consider targeting cognitive rigidity. Given that RRBIs are a core diagnostic criterion for autism, it is important to understand how different types of eating behaviors relate to RRBIs. This is especially important given a recent large-scale study found eating behaviors as a primary predictor of an autism diagnosis (Rajagopalan et al., 2024). Overall, this study provides a preliminary understanding of the relationship between RRBIs and eating behaviors in autism and continues to highlight the need to develop personalized treatment approaches. Future research should explore these associations longitudinally with a larger and more diverse sample to support individualized, evidence-based approaches in clinical settings.

**References:**

Allen, S. L., Smith, I. M., Duku, E., Vaillancourt, T., Szatmari, P., Bryson, S., Fombonne, E., Volden, J., Waddell, C., Zwaigenbaum, L., Roberts, W., Mirenda, P., Bennett, T., Elsabbagh, M., & Georgiades, S. (2015). Behavioral Pediatrics Feeding Assessment Scale in Young Children With Autism Spectrum Disorder: Psychometrics and Associations With Child and Parent Variables. *Journal of Pediatric Psychology*, *40*(6), 581–590. https://doi.org/10.1093/jpepsy/jsv006

Harrop, C., Sterrett, K., Shih, W., Landa, R., Kaiser, A., & Kasari, C. (2021). Short-term trajectories of restricted and repetitive behaviors in minimally verbal children with autism spectrum disorder. *Autism Research*, *14*(8), 1789–1799. https://doi.org/10.1002/aur.2528

Mayes, S. D., & Zickgraf, H. (2019). Atypical eating behaviors in children and adolescents with autism, ADHD, other disorders, and typical development. *Research in Autism Spectrum Disorders*, *64*, 76–83. https://doi.org/10.1016/J.RASD.2019.04.002

Nadeau, M. V., Richard, E., & Wallace, G. L. (2021). The Combination of Food Approach and Food Avoidant Behaviors in Children with Autism Spectrum Disorder: “Selective Overeating.” *Journal of Autism and Developmental Disorders 2021*, 1–8. https://doi.org/10.1007/S10803-021-04945-6

Page, S. D., Souders, M. C., Kral, T. V. E., Chao, A. M., & Pinto-Martin, J. (2021). Correlates of Feeding Difficulties Among Children with Autism Spectrum Disorder: A Systematic Review. *Journal of Autism and Developmental Disorders 2021*, 1–20. https://doi.org/10.1007/S10803-021-04947-4

Rajagopalan, S. S., Zhang, Y., Yahia, A., & Tammimies, K. (2024). Machine Learning Prediction of Autism Spectrum Disorder From a Minimal Set of Medical and Background Information. *JAMA Network Open*, *7*(8), e2429229. https://doi.org/10.1001/jamanetworkopen.2024.29229

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