Title: Early Identification in Autism: Subtypes Based on Child, Family, and Community Characteristics

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Introduction: Early identification is crucial to the developmental trajectories of children with ASD because early intervention services can facilitate optimal outcomes. The American Academy of Pediatrics screening guidelines highlight the importance of listening closely to parent concerns as an effective strategy to identify children earlier (Johnson & Meyers, 2007). While the AAP guidelines have led to increased rates of developmental screenings during pediatric visits and earlier identification of ASD (e.g., Radecki, Sand-Loud, O’Connor, Sharp, & Olson, 2011), many children, especially those considered underserved (i.e., low-income, rural, or racial/ethnic minorities), still receive later diagnoses. Given the immense heterogeneity in symptoms, behaviors, and family backgrounds across autism spectrum disorders (ASD), we investigated subtypes of children with an eventual ASD diagnosis based on parent concerns and socio-demographics. Research questions included: 1) among children with ASD, how do early parent concerns, child (i.e., age and gender), family (i.e., race/ethnicity, SES), and community (i.e., provider access) characteristics group by subtypes, and 2) to what extent do subtypes of children with ASD differ by chronological age (CA) at the diagnostic evaluation and age of child when a parent first became concerned (AOFC)?

Method: We performed a secondary analysis with data drawn from a medical university child diagnostic center in a large metropolitan area. The sample included children (n=712) 12 months- 12 years 11 months (M=66.68 months; SD= 34.28) who received a diagnostic evaluation and were diagnosed with ASD. We examined intake information completed by parents prior to the diagnostic evaluation including: 1) parent concerns, 2) child’s age at diagnostic evaluation, 3) child gender, 4) family socioeconomic status (SES), 5) race and ethnicity, 6) access to service providers, and 7) AOFC. On intake paperwork parents also reported their top three concerns. We coded parent concern statements into six categories (adapted from Ozonoff et al., 2009), including: 1) behavior/temperament, 2) general development, 3) speech/communication, 4) social interactions, 5) stereotyped behaviors, and 6) medical. Coders examined percent agreement with 20% of the dataset and achieved 89%. To address the first research question, we used latent class analysis (LCA). LCA aims to find clusters of individuals with similar characteristics and parse the heterogeneity of populations. To address research question two, we performed a non-parametric Kruskal-Wallis H-Test to examine how latent classes differed by age at the diagnostic evaluation and AOFC.

Result: After comparing the fit statistics (i.e., Akaike Information Criterion, Bayesian Information Criterion, Adjusted Bayesian Information Criterion, Vuong-Lo-Mendell Rubin, Lo-Mendell-Rubin, bootstrap likelihood ratio test, entropy) of a two to seven class solution, results revealed a five-class solution fit best. Mean conditional probabilities for the five-class solution ranged from 89.14-98.58, indicating good fit. Parent concerns and socio-demographics distinguished five latent classes. Two subtypes were identified younger and were differentiated by communication and medical concerns. One of these younger subtypes included non-white, Hispanic children utilizing Medicaid. Another subtype was identified around kindergarten and was differentiated by stereotyped and by developmental parent concerns. Lastly, two subtypes were identified at an older age with either developmental concerns, or social and behavior concerns. One of the oldest subtypes was characterized by females with ASD.

Discussion: Information gleaned from this study advances our knowledge on methods to identify subtypes of children with ASD earlier. By understanding ASD subtypes based on parent concerns from diverse socio-demographics, we may better inform universal screening procedures. Our study suggests that children with speech and communication parent concerns are most likely identified earlier regardless of race, ethnicity, or SES. Whereas, children with social, behavior, or stereotyped parent concerns were diagnosed later. Further, our findings point to the difficulty in identifying females with ASD, as well as children with social, behavior, and stereotyped parent concerns. Future research should examine the distinct subtypes of females with ASD. Additionally, while certain social, behavioral, and stereotyped behaviors are acceptable during early years of childhood, more research is needed to determine methods to distinguish these types of parent concerns at an earlier age.

References/Citations: