Title: Creating a Standardized, Online Screening Assessment for Detecting Early Childhood Delays

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Introduction: Despite advances in technology, recommendations from the American Academy of Pediatrics (Bright Futures Steering Committee, 2006), and evidence for the utility of developmental screening (Carroll, Bauer, Dugan, Anand, Saha, & Downs, 2014), the use of standardized developmental screening is inconsistently implemented. According to a recent US survey, roughly 30% of children had received a parent-completed screening assessment (Hirai, Kogan, Kandasamy, Reuland, & Bethell, 2018). This is especially important, since screening can help identify children at risk of developmental delay without unnecessary over-referrals (Glascoe, 2001). Our goal in the current study was to develop and validate a parent-report standardized assessment to screen for developmental delays in early childhood that could be scored without the assistance of a clinician or medical professional. Our survey is based on developmental milestones for language, motor, and social skills. Unlike many existing tools, our assessment is designed to assess a broad range of skills, identify areas of relative strength of weakness, automatically generate standard scores based on a large normative sample, and is completed online.

Method: Normative data were collected from a nationally representative sample (N = 1995) recruited using Dynata. Parent-reports were obtained for children ranging from 25 to 73 months of age. These data were used to create age-based norms and standard scores for five developmental domains (Expressive Language, Receptive Language, Gross Motor, Fine Motor, and Social Skills). Concurrent validation data were collected from 234 patients who presented to a neurodevelopmental pediatric clinic for evaluation of developmental delay. We also compared scores with diagnoses of several different types of early childhood developmental delay (e.g. Autism Spectrum Disorder (ASD), intellectual disability, or speech delays).

Results: All domain scores were found to be positively related, with the strongest relationship between Expressive and Receptive Language (r = .81, p < .05). We observed strong convergent validity between domain standard scores and relevant, standardized assessments. For example, parent-reported Social scores were strongly related to social skills as measured by the Social Responsiveness Scale (r = -.61, p < .05) and the Social composite score from the Adaptive Behavior Assessment System (r = .59, p < .05). Likewise, parent-reported Expressive and Receptive Language scores were each strongly related to Expressive and Receptive Language scores (r = .69 and .59, r < .05) from the Capute Scales. Next, we also used domain scores to predict diagnoses of broad and specific types of developmental delay. Language domain scores were the best predictor of receiving any diagnosis of developmental delay (Sensitivity = 58%, Specificity = 76%). Regarding more specific diagnoses, Social domain scores were the best predictor of ASD diagnosis (Sensitivity = 78%, Specificity = 58%). These results suggest that analysing scores in discrete areas of development (e.g., social) may better predict diagnoses than use of a singular pass/fail metric.

Discussion: Based on our results, our parent-reported scales provide valid measures of developmental domains and may be useful in predicting diagnoses of broad or specific developmental delays in early childhood. Future research is still needed to observe the predictive validity of our scales once in use and to better understand how these scores can best inform referrals. We hope that our screening tool can provide an easy, cost-effective way to provide early childhood developmental screening to a broader patient population and to help improve the detection of developmental delays.

References:


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