Title: The Performance of the First Year Inventory (FYI) on a Sample of High-Risk 12 month-olds Diagnosed with Autism Spectrum Disorder (ASD) at 36 months

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Introduction: The First Year Inventory (FYI; version 2.0) (Baranek, et al., 2003) is a parent-reported screening instrument designed to identify 12-month-olds who may be at risk for a later diagnosis of Autism Spectrum Disorder (ASD). Although the instrument has been norm-referenced using a community sample and showed a capacity to discriminate between typically developing infants and those who are eventually diagnosed with ASD (Turner-Brown, et al., 2013), a limited body of research has examined the performance of the instrument in a high-risk sample, such as siblings of children with ASD (Macari, et al., 2014; Rowberry, et al., 2015). Parents of infants who have older siblings diagnosed with ASD may understand behaviors that indicate risk markers differently than parents from community samples on the basis of comparison to the older child. Therefore, it is important to further evaluate the utility of the FYI with high-risk populations. The main aim of the present study is to examine differences on the FYI among 12-month-old high-risk infants later diagnosed with ASD (HR-ASD), high-risk infants not diagnosed with ASD (HR-N), and a comparison group of low-risk infants not diagnosed with ASD (LR control).

Method: This prospective study took place across three sites in Canada. 135 parents of high-risk infant siblings (infants with an older sibling with ASD) filled out the FYI when their infants were 12 months of age. Infants were followed to 36 months for ASD diagnostic assessments by clinicians blinded to the children’s group assignments. 121 cases had complete data at both time-points and were included in the final analyses. 29 infants were categorized as HR-ASD, 57 were categorized as HR-N, and 35 were categorized as LR control.

(Measures) The FYI is a 63-item parent-report instrument which measures infant behaviors across two domains: social communication (SC) and sensory regulatory functions (SR). Items were scored and weighted according to the risk scoring algorithm described by Reznick et al., 2007, and yielded a summary risk score for each of the two domains (SR and SC) separately. Clinical diagnosis of ASD was made by licensed clinicians using the Diagnostic and Statistical Manual of Mental Disorders (4th ed.) and included the gold-standard diagnostic measures (ADOS; ADI-R) as well as other developmental assessments.

Results: The total FYI significantly predicted ASD diagnosis at 36 months (logistic regression c=0.721, p=0.0002 for the full study sample; c=0.630, p=0.02 for the high-risk subgroups). One-way Analysis of Variance (ANOVA) showed that the three groups had significantly different mean FYI scores SR and SC scores (F=9.59, p=.0001 and F=22.38, p<.0001, respectively; all pairwise comparisons, except the comparison of SR between HR-ASD and HR-N groups, were statistically significant after Bonferroni adjustment). Specifically, the HR-ASD group showed the highest mean scores across the two FYI domains and the total FYI risk score while the LR-control showed the lowest scores (Figure 1). Moreover, among high-risk infants not diagnosed with ASD at age 3 years, the clinicians who were blinded to risk status diagnosed a significantly larger proportion of the HR-N sibling group (49.1%) than the LR-control group (8.6%) (p<.0001) with some type of developmental disorders other than ASD (e.g., language delay, global development delay, other concerns).

Discussion: In line with the previous studies (e.g., Rowberry, et al., 2015), our preliminary analyses showed that at 12 months of age, the FYI discriminates high-risk infants who are later diagnosed with ASD from high-risk infants who are not, and the differences between the two groups in the social communication domain score was significantly different. However, additional to Rowberry et al.’s findings, our analyses found significant differences between the two HR groups in the sensory regulatory domain as well. Moreover, we found that the FYI discriminated the two HR groups from a small low-risk control group. Specifically, the instrument seems to capture 12 month-olds’ non-ASD developmental disabilities (DD), which is picked up by the clinicians at age 3. Future work needs to examine the utility of various screening cut-points for different risk populations, including high-risk infant-sibling samples as well as low-risk community samples, and evaluate the positive predictive value for outcomes of both ASD and other DDs.
References/Citations: