Title: Stability of Indices of Sensory Responsiveness in Infants at Risk for Autism Spectrum Disorder

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Introduction: Individuals with autism spectrum disorder (ASD) have been documented to have atypical behavioral responses to sensory stimuli (i.e., differences in sensory responsiveness; Baranek, David, Poe, Stone, & Watson, 2006), emerging as early as infancy. These atypical responses can range from hyporesponsiveness (reduced or absent responding to sensory stimuli) to hyperresponsiveness (exaggerated responding to sensory stimuli) and may vary according to sensory modality (e.g., auditory, visual, tactile, proprioception). Ongoing work in our lab aims to evaluate the extent to which early sensory responsiveness is valid or clinically useful for predicting social communication and language development in infants who are at heightened risk for ASD based on their status as younger siblings of children who are diagnosed with the disorder. The predictive validity of sensory responsiveness will be mathematically limited, however, by the stability of our indices of sensory responsiveness. One way that we may boost stability indices of sensory responsiveness to be used in analyses is to create aggregate score/s from multiple measures. This study will evaluate a) whether the creation of aggregate scores is warranted and b) if so, what level of stability will be achieved for infants at high familial risk for ASD and low-risk controls (infant siblings of typically developing children).

Method: This sample is being drawn from an ongoing longitudinal study of infants at low- and high-risk for ASD between 6 and 18 months of age. For each infant, two measures of sensory responsiveness are being collected concurrently: the Sensory Experiences Questionnaire (SEQ; a parent report of sensory responsiveness across everyday settings) and the Test of Sensory Function in Infants (TSFI; a standardized behavior sample of sensory responsiveness). Hyporesponsiveness and Hyperresponsiveness scores were derived from the SEQ in accordance with guidelines set forth in the manual for this measure. Hyporesponsiveness and Hyperresponsiveness scores were derived from the TSFI using a coding/scoring system that was modified from the manual for the purposes of this project. TSFI was administered at 90% fidelity, and the scoring reliability with the modified coding system was very high (ICCs = .89 - .91). Bivariate correlational analyses (Spearman’s rank, based on non-normal data distributions) were carried out to determine whether there was empirical support for aggregation of hypo and hyper scores across measures. When aggregation was warranted, a Generalizability and Decision (G & D) study was carried out to evaluate the achieved boost in stability achieved via creation of the aggregate variable. The a priori criterion set for aggregation was intercorrelation of .4. The desired threshold for acceptable stability was set at a minimum g ≥ .6.

Results: Preliminary analyses were conducted on 14 infants, aged 6-18 months (Mage = 12.5 mos), 6 males and 8 females, 6 high-risk and 8 low-risk for whom the two measures of sensory responsiveness of interest were collected concurrently. Preliminary analyses supported aggregation for the two measures of hyporesponsiveness, ρ = -0.54, p = 0.044, but not for the two measures of hyperresponsiveness, ρ = -0.18, p = 0.53. The G study indicated that aggregation of the two measures of hyporesponsiveness would yield a variable with stability that approached, but not quite reach the threshold set for acceptable stability (absolute g for two measures = .56). The D study indicated that we would surpass the criterion for acceptable stability with a third measure of hyporesponsiveness (projected g for three measures = .66).

Discussion: This study suggests that multiple measures of sensory responsiveness have the potential to yield stable estimates of some aspects of sensory responsiveness in infants, particularly hyporesponsiveness, but that derivation of reliable estimates for other aspects of sensory responsiveness, such as hyperresponsiveness, may be more challenging to acquire in the earliest stages of development. Implications for research and practice in infants at risk for neurodevelopmental disorders will be discussed.
References/Citations:


