Title: Preliminary Results of the Sensory Project in Infant Siblings: Early Sensory Responsiveness is Linked with Communication Development in Infants at Risk for Autism


*Vanderbilt University

Purpose: It has been proposed that differences in sensory responsiveness (i.e., patterns of responding to sensory stimuli), particularly in the earliest stages of development, may produce “cascading effects” on communication and language development in children with autism spectrum disorder (ASD). This theory has been challenging to test, in part because we cannot always reliably diagnose ASD in the earliest stages of development (i.e., in infancy). As a potential solution to this problem, the Sensory Project in Infant Siblings (Project SPIS) is prospectively following infants known to be at high risk for ASD and other language and communication impairments based on their status as younger siblings of children with ASD (Sibs-ASD) to evaluate (a) when differences in sensory responsiveness emerge and (b) the extent to which they may be useful for predicting future communication and language outcomes. This NIDCD-funded longitudinal correlational study is ongoing. Here, in a test of preliminary results, we evaluate (a) whether sensory responsiveness differs in infant Sibs-ASD relative to infant siblings of typically developing children (Sibs-TD) at entry to Project SPIS, (b) whether early sensory responsiveness is associated with concurrent (entry-level) communication and language skill, and (c) whether concurrent associations between sensory responsiveness and communication/language skill vary according to risk group.

Methods: Preliminary analyses were conducted on 28 infants between the ages of 11 and 18 months (11 Sibs-ASD, 17 Sibs-TD). Patterns of sensory responsiveness were measured with two previously developed and validated measures of early sensory responsiveness - the Sensory Experiences Questionnaire (SEQ) and the Sensory Processing Assessment (SPA; these observational samples will be coded and available for inclusion in analyses for the Gatlinburg Conference). At this same time point, parents reported on their children’s communication and language skill via the Vineland Adaptive Behavior Scales (VABS) and the MacArthur-Bates Communicative Development Inventories: Words and Gestures (MCDI) checklist. Infants’ prelinguistic skill was also assessed using the Communication and Symbolic Behavior Scales (CSBS). A partial interval coding system was utilized to code media files of CSBS samples for the presence/absence of communication acts, vocalizations including canonical syllables, and selected consonants. Two metrics of prelinguistic vocal complexity were derived: (a) canonical syllabic communication (i.e., the proportion of intentional communication acts that included a canonical syllable), and (b) consonant inventory (number of different consonants used in communication acts).

Results: Preliminary results (based on parent reports of sensory differences only) show that the two groups do not significantly differ in the three primary patterns of sensory responsiveness at 11-18 months of age, sensory seeking (d = 0.42, t = 1.07, p = 0.30), hypersensitivity (d = 0.11, t = 0.28, p = 0.78) and hyperresponsiveness (d = −0.34, t = 0.88, p = 0.39). However, individual differences in patterns of sensory responsiveness are associated with several indices of concurrent communication and language ability. For example, more hypersensitive symptoms were significantly correlated with decreased communication skill (e.g., zero-order correlation between hypersensitive and VABS communication = −0.45) and decreased vocabulary size on the MCDI (zero-order correlations with expressive and receptive vocabulary = −0.40 and −0.36, respectively) on average across groups. Additionally, more hyperresponsive symptoms were associated with decreased canonical syllabic communication and consonant inventory (−0.44 and −0.35, respectively). The aforementioned associations do not vary according to group (p values for group*p predictor product terms in regression analyses testing moderated effects > .05). Final analyses, including results from observational measures of sensory seeking behavior, will be presented at the Gatlinburg conference.

Discussion: The aforementioned findings lend increased empirical support to the cascading effects theory. Preliminary results from Project SPIS indicate that there are not significant between-groups differences in Sibs-ASD versus Sibs-TD on patterns of sensory responsiveness in the first year of life, but that individual differences in early sensory responsiveness are linked with
communication and language development across risk groups. We are presently following these infants longitudinally to determine the extent to which early sensory responsiveness may be useful for predicting future language and communication skill, and to evaluate a number of putative mechanisms by which sensory responsiveness may influence language and communication development. Implications for research, theory, and practice will be discussed. If our hypotheses are born out, findings from this project may facilitate early identification, and point towards sensory responsiveness as a potentially important target of early “preventative” interventions for infants at heightened risk for ASD.

References/Citations: