Maternal Touch in Early Development: Behavioral patterns and Neural Responses in Infancy

Juliana Serra, Helga Miguel, Isabel Lisboa, Adriana Sampaio, & Alfredo Pereira

NOVA School of Science and Technology, Center of Technology and Systems (UNINOVA-CTS), NOVA University Lisbon

Maternal touch is a constitutive aspect of early infant development with plenty of evidence showing its association with developmental outcomes. The importance of touch stands in contrast with the sparsity of studies that observed mothers' use of touch in more naturalistic tasks. This work presents findings from two studies – using the same longitudinal dataset – measuring maternal touch during play and its association with infants' brain responses to tactile stimuli. Mother-infant dyads were tested at 7 and 12 months. In a first study we segmented and categorized, using a microanalytic coding system, all maternal touch events during a structured social interaction procedure. Maternal touch was most frequent during dyadic play, with affectionate, static, and playful touch predominating. In contrast, object-mediated touch was more common during triadic object play. Touch frequency declined with age, mainly due to a large reduction in static and object-mediated touch, suggesting that maternal touch adapts to the infant's evolving needs and the demands of different play tasks. The second study investigated the association between maternal touch frequency in dyadic play and infants' brain responses to touch. The infant was tested in a touch task where an experimenter applied two types of touch: affective (gentle brushing) and discriminative (light tapping with a wooden block). Using fNIRS, changes in oxyhemoglobin in the left somatosensory cortex and right superior temporal sulcus (STS) were measured. At 7 months, greater maternal touch was linked to reduced somatosensory activation during affective touch but increased STS activation for both stimuli. By 12 months, maternal touch was associated with enhanced STS activation for affective touch and reduced STS activation for discriminative touch. These findings underscore the importance of maternal touch in shaping early brain development and its influence on infants' neural responses to tactile stimuli.Keywords: fNIRS; Mother-infant interactions; Observational measures; Social touch; Touch processing

Language abilities in infants with Down Syndrome: An experimental study on early perception of intonation

Cátia Severino, Marina Vigário, & Sónia Frota

Universidade de Lisboa, Centro de Linguística

Although language difficulties have been highlighted as a cornerstone of the developmental profile in Down Syndrome (DS), few studies have examined early language abilities in children with DS to determine initial strengths and weaknesses that might inform early language interventions to support language development in this population. The present study focused on early perception of intonation and examined whether it differed in infants with DS and typically developing (TD) peers. We used the visual habituation paradigm from Frota et al. (2014), who studied TD infants' ability to distinguish the intonation patterns of statements and yes-no questions in European Portuguese. Infants with DS (N=21, Mage=7;18, age range 5;03 to 13;08) were found to look longer to switch trials when compared to same trials. A RM ANOVA revealed an effect of trial type (p=.03), indicating successful discrimination, similarly to TD infants. To explore potential age effects, looking times for same and switch trials for TD and DS younger (below 7mos) and older (above 7mos) infants were compared through a GLMM analysis. An interaction trial type*group type*age group was found (p=.039). Unlike both groups of TD infants and younger infants with DS, older infants with DS were unable to discriminate the intonation contrast. Our findings highlight the importance of prosody in early development also in infants with DS. Moreover, the decrease in early sensitivity to intonation in older infants with DS pinpoints a crucial developmental window – the first semester of life – for early interventions using intonation to support language learning in these infants.