Severity of Childhood Trauma Experiences Predict Maternal Brain Response to Hearing Own- Versus Other-Baby Cries
Jerrica Pitzen, M.S., Alissa Huth-Bocks, Ph.D., S. Shaun Ho, Ph.D., M.S., Katherine Guyon-Harris, M.S., Sarah Ahlfs-Dunn, Ph.D., Jessica Riggs, M.S., Brittani Hollern, B.A., Beth Jakubowski, B.A., and James Swain, M.D., Ph.D.
Eastern Michigan University, Ypsilanti, MI and Stony Brook School of Medicine, Stony Brook, NY

Introduction
- Research has shown that mothers who experienced traumatic events as adults display changes in brain activity when viewing images of their children (Kim et al., 2016; Moser et al., 2013; Schechter et al., 2012).
- Additionally, decreased brain activity in areas associated with emotion regulation has been found in adults who have experienced childhood maltreatment (Kim et al., 2013).
- However, there is currently a dearth of research exploring the relationship between childhood trauma and mothers’ brain activity when they are exposed to other parenting stimuli (Evans et al., 2015; Kim et al., 2010).
- In the present study, it was hypothesized that mothers with more severe histories of childhood trauma would display atypical brain responses when exposed to parenting stimuli associated with parenting and attachment, specifically, hearing a baby’s cry.

Method

Participants
- Age: Mean = 26 yrs; Range = 19-39; SD = 6.1
- Monthly Family Income: Median = $1200
- 100% received services from WIC and 93% had public health insurance
- Education: Some college = 50%, High school or less = 21%, College or graduate degree = 29%
- Family status: Single parents = 93%, First-time mothers = 21%

Procedures
- Participants in the present study included a subsample of 14 ethnically diverse and economically disadvantaged women who participated in a larger prospective, longitudinal study (N = 120) on parenting beginning in the third trimester of pregnancy. Participants were originally interviewed at pregnancy (T1; N = 120) and again at 3-months (T2; n = 119), and at 1-(T3; n = 115), 2- (T4; n = 99), and 3-years postpartum (T5; n = 81).
- The subsample of mothers were selected based on their high disorganization scores at pregnancy on the Working Model of the Child Interview (Crawford & Benoit, 2009; Zeahang, Benoit, & Barton, 1986); they participated in an additional wave of data collection two years after the conclusion of T5 that included a lab visit for neuro-imaging and the collection of additional measures, which occurred when their children were five years old.
- The subsample also endorsed high rates of childhood emotional abuse (57%), physical abuse (71%), and sexual abuse (57%) and intimate partner violence during their lifetime (86%).

Measures
- Maternal experiences of childhood maltreatment were assessed during pregnancy using the Childhood Trauma Questionnaire- Short Form (Bernstein et al., 2003).

Results

Predictors were entered into a GLM model in SPM8, and the threshold for significant results was set at p < 0.05, uncorrected, with at least 200 voxels (the unit in 3D, similar to pixel as the unit in 2D) in a cluster.

Discussion
- In contrast to typical parents who display a clear discrepancy in brain response while listening to own- versus other-baby cries (i.e., typically showing greater activation of these brain regions when hearing own-baby cries as compared to other-baby cries), these results suggest that mothers’ experiences of childhood maltreatment may dampen or blunt empathic responses when hearing their own baby’s cry, even after controlling for prenatal intimate partner violence (Hipwell et al., 2015; Swain, 2008).
- These brain differences among mothers with varying childhood maltreatment experiences may help explain behavioral observations of atypical and problematic parenting behaviors among trauma-exposed mothers in prior research.
- Limitations of the current study include a small sample size and the use of an uncorrected p-value, suggesting that results should be interpreted with caution. Additional analyses using more stringent significance levels and larger samples are needed to determine if the results of the present study are replicated.

Contact Information: Jerrica Pitzen, M.S.
jpitzen@emich.edu