

## **A psychophysiological perspective of the transformative experience of pregnancy**

### **ABSTRACT:**

#### **Background**

Pregnancy may be conceptualized as a period of psychophysiological reorganization to facilitate later caregiving for women and men. In understanding the perinatal origins of parenting, studies have begun to examine parental, specifically maternal, neural responsiveness to infant affective cues during pregnancy, and their potential implications for caregiving postpartum. However, while relations between psychological measures of parenting and caregiving postpartum have been examined, the associations between neural and psychological measures of parenting in pregnancy are yet to be established. Further, the relative strength of and differences in observed relations for expectant mothers and fathers is unknown.

#### **Aims**

In expectant parents, our aims were to examine (1) the P300 elicited by photographs of distress and neutral infant faces; (2) levels of prenatal mind-mindedness as a psychological construct important for later parenting; and (3) whether the P300 would be associated with prenatal mind-mindedness.

#### **Method**

Expectant mothers ( $n=38$ ) and fathers ( $n=30$ ) during the third trimester of pregnancy viewed infant distress and neutral faces while electroencephalography was recorded. Following pre-processing, the P300 amplitude was measured for each participant. Parents also completed an assessment of prenatal mind-mindedness towards their unborn child.

#### **Results**

Expectant fathers evidenced a greater P300 response to infant faces as compared to expectant mothers, specifically for infant distress. P300 reactivity to infant distress, relative to neutral, faces was associated with prenatal mind-mindedness in expectant fathers but not expectant mothers.

#### **Conclusions**

Although extension and replication of these findings are warranted, they raise important insight into sex differences in the experience of pregnancy. They also speak to the neural and psychological preparedness of expectant fathers, which has not previously been considered.

#### **Keywords**

Expectant parents, Parental brain, ERP/EEG, Infant faces, Mind-mindedness

**Published Work:**

O’Hair, C., Armstrong, K., & Rutherford, H. (2018). The potential utility for massage therapy during pregnancy to decrease stress and tobacco use. *International Journal of Therapeutic Massage & Bodywork*, 11(3), 15-19. PMC6087659

Rutherford, H. J., Yip, S. W., Worhunsky, P., Zhang, R., Yip, S. W., Morie, K. P., ... Potenza, M. N. (2019). Gradient theories of brain activation: A novel application to studying the parental brain. *Current Behavioral Neuroscience Reports*, 6(3), 119.125. doi: 10.1007/s40473-019-00182-5

Rutherford, H., Crowley, M. J., Gao, L., Francis, B., Schultheis, A., & Mayes, L. (2018). Prenatal neural responses to infant faces predict postpartum reflective functioning. *Infant Behavior and Development*, 53, 43-48. doi: 10.1016/j.infbeh.2018.09.003

Rutherford, H., Maupin, A., & Mayes, L. (2018). Parity and neural responses to social and nonsocial stimuli in pregnancy. *Social Neuroscience*, 14(5), 545-548. doi: 10.1080/17470919.2018.1518833

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