

Snyder, K. A., & Keil, A. (in press). Repetition suppression of induced gamma activity predicts enhanced orienting toward a novel stimulus in 6-month-old infants. *Journal of Cognitive Neuroscience*, 20 (8).

Abstract

Habituation refers to a decline in orienting or responding to a repeated stimulus, and can be inferred to reflect learning about the properties of the repeated stimulus when followed by increased orienting to a novel stimulus (i.e., novelty detection). Habituation and novelty detection paradigms have been used for over 40 years to study perceptual and mnemonic processes in the human infant, yet important questions remain about the nature of these processes in infants. The aim of the present study was to examine the neural mechanisms underlying habituation and novelty detection in infants. Specifically, we investigated changes in induced alpha, beta, and gamma activity in 6-month-old infants during repeated presentations of either a face or an object, and examined whether these changes predicted behavioral responses to novelty at test. We found that induced gamma activity over occipital scalp regions decreased with stimulus repetition in the face condition but not the toy condition, and that greater decreases in the gamma-band were associated with enhanced orienting to a novel face at test. The pattern and topography of these findings are consistent with observations of repetition suppression in the occipital-temporal visual processing pathway, and suggest that encoding in infant habituation paradigms may reflect a form of perceptual learning. Implications for the role of repetition suppression in infant habituation and novelty detection are discussed with respect to a biased competition model of visual attention.