

## **Event-related brain potential correlates of conscious and non-conscious processing in anxiety**

### **Results:**

An adaptation paradigm was used for Experiment 1 (N=40 in final sample), where fear-neutral morphed expressions were classified for affect after exposure to either fear or neutral faces. There was a shift towards 'fearful' classifications of morphs following neutral compared to fear adaptation. ERP data analysis revealed a more pronounced late positive potential (LPP), beginning at ~400 ms post-stimulus onset, in high but not low anxious people following neutral compared to fear adaptation. As behavioural adaptation increased there was a linear augmentation in the magnitude of the late-LPP. These effects were apparent for trait and state anxiety, and for depression. These data show that negative moods are associated with increased sensitivity to visual contextual influences from top-down elaborative modulations, as reflected in an enhanced LPP deflection. In two oddball experiments, irrelevant emotional expressions were presented outside of (Experiment 2, N=13 in final sample) or within (Experiment 3, N=15 in final sample) focal attention. The neurophysiological markers for emotional processing (LPP, Early Posterior Negativity [EPN]) were observed when the irrelevant emotional expressions were the focus of attention (Experiment 3) but eliminated when outside of focal attention (Experiment 2). The visual mismatch negativity (vMMN), said to index automatic encoding violations of visual featural regularities, was observed for unattended happy emotional expressions but not for fearful ones. The 'pre-attentive' encoding of featural changes arose only for happy faces and not for other less featurally salient expressions, such as fear. These data suggest that spatial attention is involved in the direct modulation of non-perceptual processes relating to the evaluation of emotional significance.

### **Published Works:**

#### Full Papers

Richards, A., Holmes, A., Bethell, E., & Pell, P. (2013). Adapting effects of emotional expression in anxiety: Evidence for an enhanced Late Positive Potential. *Social Neuroscience*, 8, 650-664.

Holmes, A., Bethell, E. & Richards, A. (to be submitted). The processing of facial emotion under conditions of non-attention: a visual mismatch negativity study.

**Area(s) of interest:** Cognitive and Affective Neuroscience

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## **Researcher's Contacts:**

Professor Anne Richards,  
Department of Psychological Science,  
Birkbeck College, University of London,  
WC1E 7HX  
UK

Dr Amanda Holmes,  
Department of Psychology,  
University of Roehampton,  
London, SW15 5PU,  
UK