

ABSTRACT

Neural Correlates of Automatic Emotional Processing and Emotion Regulation in Empathy and Psychopathy-Related Coldheartedness

by

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Psychopathy is a personality disorder that is defined, in part, by a lack of empathy. Psychopathy-related empathic deficits have been associated with atypical behavioral and neural responses to emotional facial expressions. However, very few studies have examined the role of mirror neuron system (MNS) functioning as it pertains to these impairments. Moreover, there is very little empirical research regarding emotion regulation in psychopathy, and specifically whether emotional responses can be intentionally upregulated. The present study sought to clarify whether the MNS is functionally intact in adults with subclinical psychopathic traits, particularly coldheartedness, and whether the MNS can be manipulated through top-down mechanisms. Five hundred six undergraduates completed the Psychopathic Personality Inventory-Revised to measure psychopathic traits and the Interpersonal Reactivity Index to measure empathic traits. Of these, 60 eligible participants then completed an EEG/ERP study. Participants first passively viewed images of emotional faces (Task 1), and then tried to increase their emotional response to the same pictures (Task 2) while their EEG was recorded. Bottom-up functioning was indexed by mu rhythm (8-12 Hz) desynchronization, a measure of MNS function. In addition, the amplitude of the P100, N170, and Late Positive Potential (LPP) event-related potentials were used to measure attentional processes, with later components reflecting more top-down processing. The change in each of these measurements from Task 1 to Task 2 was used to index

upregulation. Contrary to our predictions, we found that Coldheartedness was not related to mu rhythm suppression or upregulation, suggesting that mirror neuron system functioning was intact. Moreover, Coldheartedness predicted larger N170 and LPP (400-600 ms) amplitudes in Task 1, indicating increased early attention to the emotional faces. Empathy, on the other hand, was related to reduced automatic attentional processing, evidenced by less mu suppression (i.e., less MNS activity), and smaller early ERP components, but greater sustained attention (as evidenced by higher amplitude LPPs), and an enhanced ability to upregulate ERP markers of early attention (i.e., P100 and N170). Together, these results provide a new perspective on the neural correlates of empathic functioning in subclinical psychopathy.