
Gender differences in pain responses under emotional stimulation: an ERP study

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Abstract

Research on pain and emotions has shown clear gender differences in psychophysiological responses of these domains, however less investigation has been carried out on the interaction between the two variables. In the present experiment, emotions were elicited through five categories of pictures with different content, valence and arousal: pleasant (erotic and sport), neutral (household objects) and unpleasant (threat and mutilation). During the 4s picture presentation, electrical painful stimuli were delivered to the left forearm with a fixed intensity of 40% above subjective pain thresholds. 17 female and 17 male participants were required to watch each picture and then to rate the perceived pain intensity and the picture pleasantness on two 10 point visuo-analogue scales. Results showed for erotic pictures compared with the other four categories, decreased self-perceived pain intensity ($F_{4,256} = 15.11$, $p < 0.001$) and dampened N150 and P260 ($F_{4,256} = 5.69$, $p < 0.001$) amplitudes independently from gender. Also Sport pictures were able, although to a less extent, to evoke dampened pain perception compared with mutilation slides, and no clear self-perceived pain differentiation was found among neutral, threat and mutilation pictures. In addition, a significant Gender by Electrode by Category interaction ($F_{8,256} = 2.08$, $p < 0.05$) for the N150 component was found. Women showed N150 amplitude significantly varying across all categories while males had smaller N150 to erotic compared with all other categories. Men and women showed clear differences in emotion modulation of pain responses with women exhibiting a stronger and more complex modulation.

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