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Stimulus appraisal modulates cardiac reactivity to briefly presented mutilation pictures

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ABSTRACT

Emotional reactions to threatening situations can be either advantageous for human adaptation or unfavorable for physical and mental health if sustained over prolonged periods of time. These contrasting effects mostly depend on the individual's capacity for emotion regulation. It has been shown, for example, that changing appraisal can alter the course of emotional processing. In the present study, the influence of stimulus appraisal over cardiac reactivity to briefly presented (200 ms) mutilation pictures was tested in the context of an affective classification task. Heart rate and reaction time of twenty-four undergraduate students were monitored during the presentation of pictures (neutral or mutilated bodies) in successive blocks. In one condition (*real*), participants were told that the pictures depicted real events. In the other condition (*fictitious*), they were told that the pictures were taken from movie scenes. As expected, the results showed a more pronounced bradycardia to mutilation pictures, in comparison to neutral pictures, in the real context. In the fictitious context, a significant attenuation of the emotional modulation (defensive bradycardia) was observed. However, this attenuation seemed to be transient because it was only observed in the first presentation block of the fictitious context. Reaction time to classify mutilation pictures, compared to neutral pictures, was slower in both contexts, reflecting the privileged processing of emotionally laden material. The present findings show that even briefly presented mutilation pictures elicit a differential cardiac reactivity and modulate behavioral performance. Importantly, changing stimulus appraisal attenuates the emotional modulation of cardiac reactivity (defensive bradycardia).

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1. Introduction

Current research on stress has focused on the negative aspects of sustained physiological activation induced by situations that represent a threat to the organism (Dhabhar and McEwen, 1999; Low et al., 2009; Lupien and McEwen, 1997; McEwen and Sapolsky, 1995; Sapolsky, 1992). In contrast, research on short-term reactions to threatening stimuli has emphasized the adaptive nature of physiological responses (Dhabhar and McEwen, 1999; McGaugh, 2000; Roozendaal, 2000). It has been demonstrated, for example, that threatening signals that trigger negative emotional reactions receive increased attention resources, modulating autonomic, somatic, and central physiological responses that facilitate stimulus processing

(e.g., Azevedo et al., 2005; Bradley, 2009; Erthal et al., 2005; Mocaiber et al., 2010; Oliveira et al., 2009; Pereira et al., 2010; Schupp et al., 2000, 2004). Therefore, whether a negative emotional reaction will be protective and beneficial for human adaptation or will be harmful and promote mental and physical illness strongly depends on the transient or sustained characteristics of the response (Parrot and Schulkin, 1993) and, mostly, on the capacity of the organism to regulate the emotional reaction.

Emotion regulation has been defined as the *deliberate* or *automatic* attempts to influence the emotions that individuals experience, when they experience these emotions, and how they experience and express them (e.g., Bargh and Williams, 2007; Gross, 1998a; Gross and Thompson, 2007). Emotion regulation can be achieved through a number of strategies. In general, regulation strategies can be classified as either response-focused or antecedent-focused strategies (Ochsner and Gross, 2005; Gross, 1998b; Ochsner et al., 2004). Response-focused strategies occur relatively late in the emotion-generation process and involve the inhibition of emotional response tendencies once the emotion has been generated. However, antecedent-focused regulation

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