



Implicit emotion regulation in the context of viewing artworks: ERP evidence in response to pleasant and unpleasant pictures



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ABSTRACT

Presenting affective pictures as a work of art could change perceivers' judgment and strength in emotional reactions. Aesthetic theory states that perceivers of art emotionally distance themselves, allowing them to appreciate works of art depicting gruesome events. To examine whether implicit emotion regulation is induced by an art context, we assessed whether presenting pleasant and unpleasant IAPS pictures as either "works of art comprising paintings, digital renderings, and photographs of staged scenes" or "photographs depicting real events" modulated perceivers' Late Positive Potentials (LPP) and likability ratings. In line with previous research and aesthetic theory, participants evaluated the IAPS pictures as more likable when they were presented as works of art than when they were presented as photographs. Moreover, participants' late LPP amplitudes (600–900 ms post picture onset) in response to the pictures were attenuated in the art context condition. These results provide evidence for an implicit emotion regulation induced by the art context.

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1. Introduction

Emotional content may be a prerequisite for creating art, but people will react differently to the emotional content of artworks than to the emotional content of photographs in newspapers or on websites. Scholars describe people's reaction to art as emotionally distanced (Beardsley, 1958; Bullough, 1912; Cupchik, 2002; Kant, 1987; Stolnitz, 1961). Visitors of a museum can appreciate the skill of an artist or the emotions expressed in a painting that depicts a war scene graphically, but can be revolted by a photograph of a war scene denoting similar content at the same time. Enjoying a painting or becoming immersed in a work of art are affective responses to art. These affective responses can be measured by self-reported pleasantness and arousal ratings, and by psychophysiological measures such as skin conductance or EEG. Do human behavioral and autonomic responses to affective pictures differ when the same pictures are presented as artworks compared to when they are presented as real-life photographs?

Usually, the strength of emotional reactions depends both on situational factors (e.g., real versus fictional danger) and appraisal strategies of the individual (e.g., voluntary reinterpretation of emo-

tional stimuli in neutral terms). Situational factors may interact with appraisal strategies as has been demonstrated in empirical research. In their classic and seminal study, Speisman, Lazarus, Mordkoff, and Davison (1964) demonstrated that the content of the soundtrack that accompanied a highly unpleasant film on subincision rites modulated the psychophysiological stress responses among viewers of the film. When the comment of the soundtrack induced defensive interpretations of the film's content, such as intellectualization or denial, participants' skin conductance levels were lower than when it induced a traumatic mode of observation. The different sound tracks can be considered situational factors that induced different types of cognitive appraisal in the participants, resulting in a more detached attitude towards the otherwise arousing stimuli materials. It should be noted that in the Speisman et al. (1964) study, participants were not explicitly instructed to voluntarily reinterpret the film content. Hence their results also demonstrate that these changes in appraisal occur in an implicit manner.

In the present study, we examined whether an art context prompts implicit changes in the appraisal of pleasant and unpleasant pictures. These changes were investigated by measuring people's aesthetic evaluation of pictures presented as artworks and similar pictures presented as non-art pictures, and by measuring their brain electrical reactions to these pictures. We employed a counterbalanced design with two conditions, presenting pictures

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from the International Affective Picture System (IAPS; Lang, Bradley, & Cuthbert, 2005) as either artworks or photographs of real events.

1.1. Art experience, distancing, and emotion regulation

Art experience is thought to be qualitatively different from everyday experience (Marković, 2012). For one, art experience takes place in a certain context (e.g., a museum) and it is assumed that such a context cues our cognitive system on how to handle and respond to objects within this context. Moreover, it might trigger the anticipation of a positive emotional pleasurable experience (Cupchik, 1995; Leder, Belke, Oeberst, & Augustin, 2004). The necessity of a quick reaction and goal-oriented actions to objects might be suppressed (Cupchik & Winston, 1996), because one usually views art in a rather safe environment and the artworks pose no threat to health or survival (Dissanayake, 2007; Tooby & Cosmides, 2001). Through the lack of practical and motivational consequences, people can adopt an emotionally distanced (Bullough, 1912; Cupchik, 2002) or disinterested (Kant, 1790/1987; Stolnitz, 1961) perspective. In art perception, people go beyond mere object recognition (e.g., Cela-Conde et al., 2004; Kawabata & Zeki, 2004) and also tend to react to structural and stylistic properties of pictures presented as artworks (e.g., Cupchik, Vartanian, Crawley, & Mikulis, 2009; Kirk, Skov, Christensen, & Nygaard, 2009). The emotional distance to an artwork may thus be further enhanced because art viewing may have the observer focus on the techniques employed in the art work rather than its emotional content (Marković, 2012).

People are capable of enjoying artworks that depict gruesome acts and situations (e.g., paintings by Francis Bacon). The art context induces a reappraisal that can be conceived as a form of implicit emotion regulation. Such implicit emotion regulation strategies may not be retained for art alone. People are capable of using the same strategies for everyday objects and situations (cf., Dewey, 2005). Emotional cues guide our attention, in order to adequately react to our environment. However, not everything that emotionally grabs our attention on one occasion is something we should consider in another situation, which is why we employ emotion regulation strategies (Gross, 1998). For example, the sound of an explosion while watching a war movie on television will be responded to differently than the sound of an explosion when we walk on the street. In any case, the emotional appraisal of visual stimuli happens quickly which is why this process can adequately be captured by EEG.

Several studies have demonstrated that the art context as such brings about changes in emotional and cognitive processing. In one study, participants' low positive feelings for disgust images became more positive when these images were framed as art photographs instead of documentary photographs (Wagner, Menninghaus, Hanich, & Jacobsen, 2014). In another study, participants judged negative stimuli as aesthetically more positive when these pictures were presented as artworks, than when the same stimuli were presented as non-art pictures (Gerger, Leder, & Kremer, 2014).

1.2. LPP and emotion regulation

In EEG research on emotion, the Late Positive Potential (LPP) is a reliable event-related potential (ERP) that indexes sustained engagement of attentional resources by motivational systems (Moran, Jendrusina, & Moser, 2013). The LPP is a slow and positive deviation that develops approximately 300 ms after stimulus onset and lasts for hundreds of milliseconds to seconds, depending on the duration of the emotional stimuli (Cuthbert, Schupp, Bradley, Birbaumer, & Lang, 2000). The amplitude of the LPP is larger to emotionally intense and arousing pictures than to neutral pictures

(Cuthbert et al., 2000; Schupp, Junghöfer, Weike, & Hamm, 2003). Importantly, people are capable of actively attenuating their emotional response. Specifically, when participants were asked to reinterpret negative images in neutral terms, their resulting LPP amplitudes decreased, reflecting the reductions in self-reported emotional intensity as a consequence of emotion regulation (Hajcak & Nieuwenhuis, 2006; Thiruchselvam, Blechert, Sheppes, Rydstrom, & Gross, 2011).

Aside from voluntary emotion regulation, the situational context can have an involuntary and automatic regulation effect. For instance, the LPP amplitudes, unpleasantness ratings, and arousal ratings were reduced when unpleasant IAPS pictures were described beforehand in neutral terms to the participants (Foti & Hajcak, 2008). Also, when unpleasant pictures were presented as fictitious (i.e., pictures from a movie scene), participants' LPP amplitudes were attenuated in comparison to pictures that were presented as real scenes (Mocaiber et al., 2010). Together, these results are indicative for context related and involuntary emotion regulation of which the perceiver might not be aware.

1.3. Research aims

The current study involved an orthogonal design to investigate the effect of art context on LPP amplitudes in response to positively and negatively valenced pictures, and on the self-reported likeability, valence, and arousal ratings for these pictures. For that reason, we presented pleasant and unpleasant IAPS pictures, which were edited to increase their aesthetic quality (see Section 2), as either works of art or photographs of real events.

Because distancing can be conceived as a form of implicit emotion regulation, we hypothesized that, as a result of distancing, LPP amplitudes would be attenuated in the artwork compared to the photograph condition. Because the LPP is clearly enhanced for both pleasant and unpleasant stimuli, compared to neutral stimuli, the LPP is assumed to be less sensitive to valence than to arousal (Leite et al., 2012; Schupp et al., 2000). However, some LPP valence effects have been reported. As attention to, and processing of, aversive stimuli may have important survival value, it can be expected that unpleasant compared to pleasant stimuli elicit larger LPP amplitudes. Larger LPP amplitudes in response to unpleasant versus pleasant pictures have been reported by a number of studies (e.g., Foti, Hajcak, & Dien, 2009; Schupp et al., 2000). In the present study, we might therefore expect larger LPP amplitudes in response to unpleasant compared to pleasant pictures.

LPP studies have demonstrated emotion down-regulation effects for both pleasant stimuli (e.g., Delgado, Gillis, & Phelps, 2008) and unpleasant stimuli (e.g., Foti & Hajcak, 2008; Hajcak & Nieuwenhuis, 2006). For the present research, we therefore expected no specific interaction of valence and context. That is, the implicit emotion regulation effect as a consequence of the art context and as reflected in the LPP will be comparable for pleasant and unpleasant pictures (i.e., a comparable reduction in arousal). Because reappraisal, as a form of emotion regulation, is thought to influence emotion processing in a relatively later stage (Thiruchselvam et al., 2011), we expected attenuated amplitudes in the art condition for the later part of the LPP in particular.

We further expected increased likeability ratings for images presented as artworks, because the aesthetic context would elicit an additional subjective satisfying reaction to the pictures' form and style (Cupchik et al., 2009; Jacobsen, Schubotz, Höfel, & von Cramon, 2006). As Gerger et al. (2014) and Wagner et al. (2014) found more positive judgments for unpleasant stimuli only, we expected that the increased likeability in the art context will be more evident for unpleasant than for pleasant stimuli. Further, we expected decreased arousal ratings and more positive valence ratings for pictures presented as artworks.

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