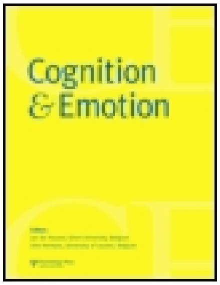

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What makes an art expert? Emotion and evaluation in art appreciation

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BRIEF REPORT

What makes an art expert? Emotion and evaluation in art appreciation

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Why do some people like negative, or even disgusting and provocative artworks? Art expertise, believed to influence the interplay among cognitive and emotional processing underlying aesthetic experience, could be the answer. We studied how art expertise modulates the effect of positive-and negative-valenced artworks on aesthetic and emotional responses, measured with self-reports and facial electromyography (EMG). Unsurprisingly, emotionally-valenced art evoked coherent valence as well as *corrugator supercilii* and *zygamoticus major* activations. However, compared to non-experts, experts showed attenuated reactions, with less extreme valence ratings and *corrugator supercilii* activations and they liked negative art more. This pattern was also observed for a control set of International Affective Picture System (IAPS) pictures suggesting that art experts show general processing differences for visual stimuli. Thus, much in line with the Kantian notion that an aesthetic stance is emotionally distanced, art experts exhibited a distinct pattern of attenuated emotional responses.

Keywords: Art; Aesthetic evaluation; Facial EMG; IAPS; Expertise; Emotion.

On April 16, 2011, after two weeks of protests and a campaign of hate mail and abusive phone calls to an art gallery displaying his work, orchestrated by groups of French Catholic fundamentalists, approximately a thousand people marched through the streets of Avignon, to protest outside the gallery.[1]

The strong negative emotional responses described above were elicited by contemporary artworks created by the artist Andres Serrano, which included a sculpture of Christ photographed in a plastic container filled with urine. In contrast to the protesters, many art experts value Serrano's

[1] http://en.wikipedia.org/wiki/Andres_Serrano

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photographs and his exhibitions attract thousands of visitors. What accounts for such discrepancies? Are art experts less likely than lay viewers to have a negative emotional response to potentially upsetting works of art to begin with? Or do they share lay viewers' emotional response but are they less likely to draw on it in evaluating a work of art? We addressed these questions by presenting contemporary works of visual art with positive or negative valence and emotion-eliciting pictures to viewers with different levels of art expertise. We assessed their emotional responses with facial electromyography (EMG) and explicit valence ratings and related them to evaluative liking judgments. We aimed to ascertain whether expertise moderates viewer's emotional reactions indicated by facial EMG and valence ratings and whether the influence of expertise on emotional responses is restricted to works of art, or more generally represents the experts' way to deal with visual depictions.

EMOTION AND COGNITION IN AESTHETIC APPRECIATION

Most theories of art appreciation (Chatterjee, 2003; Leder, Belke, Oeberst, & Augustin, 2004) posit an interaction of cognitive and emotional factors influencing aesthetic appreciation. During early stages of aesthetic perception viewers assess perceptual features of the stimulus quickly and automatically (Leder et al., 2004). The experience of such processes as fluent (e.g., due to contrast, prototypicality or familiarity) contributes to positive emotional states (for a review, see Reber, Schwarz, & Winkielman, 2004). Subsequent stages, related with understanding the work, involve a more explicit processing of stimulus features, including the artwork's content and style. At this stage, evaluations are informed by viewers' thoughts about the work as well as by their emotional responses to it. Thoughts and feelings influence one another, as observed in other domains (Schwarz & Clore, 2007).

Aesthetic experience, thus, emerges from a complex interplay of cognitive and emotional processes. Regarding the role of expertise, Leder and colleagues (2004; see also Cupchik & Laszlo, 1992) suggested that these processes are tightly intertwined for lay viewers, who rely heavily on their gut response in evaluating artworks, consistent with feelings-as-information theory and related models (Reber et al., 2004; Schwarz, 2012). Thus, they like what makes them feel good and what elicits positive emotions (Augustin & Leder, 2006). Structural equation modelling of various ratings has shown that the strength of inter-correlations among emotional and cognitive variables involved in aesthetic appreciation decreases with increasing expertise (Leder, Gerger, Dressler, & Schabmann, 2012). However, little is known about which emotional and cognitive processes contribute to these expertise effects. Hence, by measuring physiological indicators of the emotional response (facial EMG) along with subjective evaluations of elicited feelings (valence ratings) and aesthetic evaluations (liking ratings), we will be able to analyse whether experts differ from laypeople in the way they respond to artworks.

Why may laypeople and experts differ in their emotional response to art? Scherer (2005) noted that the same objective stimulus elicits different responses when encountered in a context defined as "art" rather than in daily life. As pieces of art, stimuli lose the goal relevance they would otherwise have, and no longer require the same behavioural response (Frijda & Schram, 1995; Silvia, 2013). Experts, who are exposed to art more frequently, may therefore be less responsive to the artworks' direct affective valence than laypeople. Moreover, their emotional response to valence may be attenuated by attention to other features, such as style and artistic execution, which may afford a way of successfully coping with content that is less available to lay viewers (Leder et al., 2004; Scherer, 2005). The emotionally distanced mode would resemble what Kant (1790/2001) proposed to be the essential aesthetic stance.

These conjectures predict that experts' EMG response to artworks, particularly artworks likely to elicit negative emotions, will be less pronounced than laypeople's EMG response. It is also possible that experts' learned stance extends to other emotionally charged visual material. We test this possibility with emotion-evoking photographs taken from the International Affective Picture System (IAPS; Lang, Bradley, & Cuthbert, 2008). Observations compatible with this conjecture were recently reported by Pang, Nadal, Müller, Rosenberg, and Klein (2013) based on event related potential (ERP) data. They concluded "that art expertise is associated with reduced ERP responses to visual stimuli in general that can be considered to reflect increased neural efficiency due to extensive practice in the contemplation of visual art" (p. 246).

PRESENT RESEARCH

We tested these predictions by presenting emotion-eliciting contemporary artworks and IAPS pictures to participants with different levels of art expertise. We assessed participants' emotional response with facial EMG while they viewed the stimuli and asked them to provide explicit ratings of valence, familiarity and liking.

EMG reliably captures subtle changes in the activities of the "smiling" (*M. zygomaticus major*) and "frowning" muscle (*M. corrugator supercilii*) which vary with affective valence and indicate the strength of the emotional reaction (Lang, Greenwald, Bradley, & Hamm, 1993). Positive affect typically elicits greater activity of the *zygomaticus* but also lesser activity of the *corrugator* and negative affect greater activity of the *corrugator* (Larsen, Norris, & Cacioppo, 2003). For laypeople it was found that aesthetic evaluations of patterns or faces can be captured by EMG, as beauty leads to positive affective reactions (Gerger, Leder, Tinio, & Schacht, 2011). However, it should be noted that cognitive processes can also affect the activation patterns of facial muscles (Lishner, Cooter, & Zald, 2008; Scherer & Ellgring, 2007). For example, lower cognitive load—which might be expected for experts, as they are highly accustomed to see and evaluate art—is associated with decreased activity of the *corrugator* (Lishner et al., 2008). Participants' ratings of stimulus valence serve as indicators of explicit affective evaluation, whereas their liking ratings serve as indicators of aesthetic evaluation (Leder et al., 2004). Familiarity ratings were assessed to validate participants' expertise, with experts expected to be more familiar with a larger number of artworks than laypeople.

Of interest is whether experts differ from laypeople in EMG response and explicit ratings, whether differences on these measures converge and whether they are limited to works of art or extend to other emotion-eliciting visual stimuli, namely IAPS pictures.

METHODS

Participants

Sixty-two psychology and art history students of the University of Vienna (mean age 24.02 years, SD = 3.31, 50 female) participated for course credit or payment of €15. Six participants were excluded due to technical problems or movement artefacts in the EMG. Following Leder et al. (2012), expertise was measured with knowledge questions about artistic styles, painters and paintings. Participants obtaining scores in the lower tertile were assigned to the low expertise group (*N* = 18; only psychology students), in the middle tertile to the medium expertise group (*N* = 18; psychology and art history students), and in the upper tertile constituted the high expertise group (*N* = 20; only art history students). The number of male and female (m/f) participants was similar among expertise groups (high: 1/19, medium: 2/16, low: 3/15).

Stimuli

In a pretest, psychology students rated 240 contemporary artworks according to valence, arousal, aesthetic quality and liking (five-point-scale). For the main study, we selected 64 artworks (listed in the Appendix). Thirty-two were negative-valenced (median rating of 1 or 2) and 32 positive-valenced (median rating of 4 or 5). In addition, 40 IAPS pictures were used, 20 with positive (M = 7.16, SD = 0.36) and 20 with negative valence (M = 2.66, SD = 0.41), based on the IAPS norms (Lang et al., 2008). IAPS pictures and artworks in each valence category did not differ with regard to mean arousal ($M_{IAPS,positive}$ = −0.45, $M_{Art,positive}$ = −0.62, $t(50)$ = 0.73, p = .471; $M_{IAPS,negative}$ = 0.45; $M_{Art,negative}$ = 0.62, $t(50)$ = −0.71, p = .484; using standardised mean scores due to different scales for artworks and IAPS pictures). However, as expected based on the IAPS norms, negative stimuli in each stimulus class were more arousing than positive ones (IAPS: $t(38)$ = 3.14, p = .003; artworks: $t(62)$ = 6.27, p < .001). All stimuli were presented on a 31″ LCD monitor (Nec MultiSyncLCD 3090 WQXi) in their largest size (2400 × 1200 pixels), keeping aspect ratios constant.

Procedure

Upon arrival, participants were briefed about the experimental procedures and signed a consent form. To keep participants unaware that facial muscle activity is recorded they were told that skin conductance responses would be collected (e.g., Gerger et al., 2011). Electrodes (Ag/AgCl, 4 mm diameter; httpw://www.easy-cap.de) filled with Signa electrode gel (Parker Laboratories, USA) were attached over the left side of the face covering the *M. zygomaticus major* and *M. corrugator supercilii* regions, complying with the guidelines of Fridlund and Cacioppo (1986) using a bipolar measurement. The ground electrode was placed over the right mastoid. Participants were seated in front of the monitor, at a distance of approximately 1 m (about 40 in).

The experiment consisted of three consecutive blocks. Only artworks were presented in block 1 (including two practice trials). Trials consisted of a fixation-crosshair (3 seconds) followed by an artwork (7 seconds). After the artwork had disappeared, participants answered “How much do you like this artwork?” on a 7-point scale (1 = do not like; 7 = like very much). In block 2 the IAPS pictures were used (with two practice trials), presented for 6 seconds rated for emotional valence (“How does this picture make you feel?”; 1 = negative; 7 = positive). In block 3 all 64 artworks were shown again and were first rated for their emotional valence (1 = negative; 7 = positive) and then their familiarity (1 = totally unfamiliar; 7 = very familiar). Stimuli were randomised within all blocks. Facial EMG was only recorded in blocks 1 and 2.

Facial EMG was recorded with a TMS International Portilab 20 channel amplifier (www.tmsi.com, Netherlands, sampling frequency: 2048 Hz; 500 Hz low-pass filtered; 20 Hz high-pass filter, 50 Hz notch filter). Video was recorded during blocks 1 and 2 to allow for screening of movement artefacts (Gerger et al., 2011). Trials containing artefacts (electrode touching, chewing, sneezing) were excluded. Between 6 and 31 trials remained in each condition for further analyses. The average percentage of remaining trials per condition was: artworks/positive = 64%, artworks/negative = 67%, IAPS/positive = 75% and IAPS/negative = 74%. Statistical analyses were based on the full-wave rectified, smoothed (125 ms time constant), z-transformed data (separately for muscle sites) averaged over consecutive 1-second intervals in relation to a 1-second baseline event (crosshair; see Fridlund & Cacioppo, 1986). Due to a technical problem the presentation duration varied within the IAPS pictures (ranging between 3 and 6 seconds). Thus, only the first 3 seconds were included in the analyses of the IAPS pictures. Data processing was performed with Matlab 7.1 (MathWorks Inc., USA) using the EEGLAB toolbox (Delorme & Makeig, 2004) and IBM SPSS Statistics 19 package. In the following, the physiological and behavioural data are reported separately for the IAPS pictures and artworks.

RESULTS

EMG responses

To test whether participants’ level of expertise had an effect on their emotional responses to works of art or IAPS pictures, we submitted the facial EMG data to mixed analyses of variance (ANOVA) with Valence (positive, negative) and Time (1-second intervals) as within-subjects factors, and Expertise (high, medium, low) as a between-subjects factor. ANOVAs were conducted separately for each muscle site (*corrugator*, *zygomaticus*) and stimulus type (artworks, IAPS). Greenhouse-Geisser corrections were applied whenever necessary (marked by the corrected degrees of freedom). Results of the EMG measures are presented in Figure 1.

EMG responses to the non-art IAPS pictures

Negative-valenced IAPS pictures elicited stronger *corrugator* activations than positive-valenced pictures, $F(1, 53) = 123.78$, $p < .001$, $\eta_p^2 = .70$, (main effect of Valence). This difference increased from the 1st to the 3rd second, $F(1.69, 89.71) = 53.44$, $p < .001$, $\eta_p^2 = .50$, for the Valence × Time interaction. There was also a significant Valence × Time × Expertise interaction, $F(3.38, 89.71) = 3.32$, $p = .019$, $\eta_p^2 = .11$, which seemed to be mainly driven by a weaker EMG activation during later time intervals—see 3rd second, Figure 1. Comparing the activations in this time interval showed a trend for a linear decrease from low to high expertise ($F(1, 53) = 3.51$; $p = .067$) in response to negative IAPS pictures but no significant changes for positive IAPS pictures ($F(1, 53) = 1.51$; p = ns). All other main effects and interactions were non-significant (all Fs < 1.62).

Conversely, IAPS pictures with positive valence elicited stronger *zygomaticus* activations than pictures with negative valence, $F(1, 53) = 65.94$, $p < .001$, $\eta_p^2 = .55$. This effect also increased over time, $F(2, 106) = 27.95$, $p < .001$, $\eta_p^2 = .35$, for

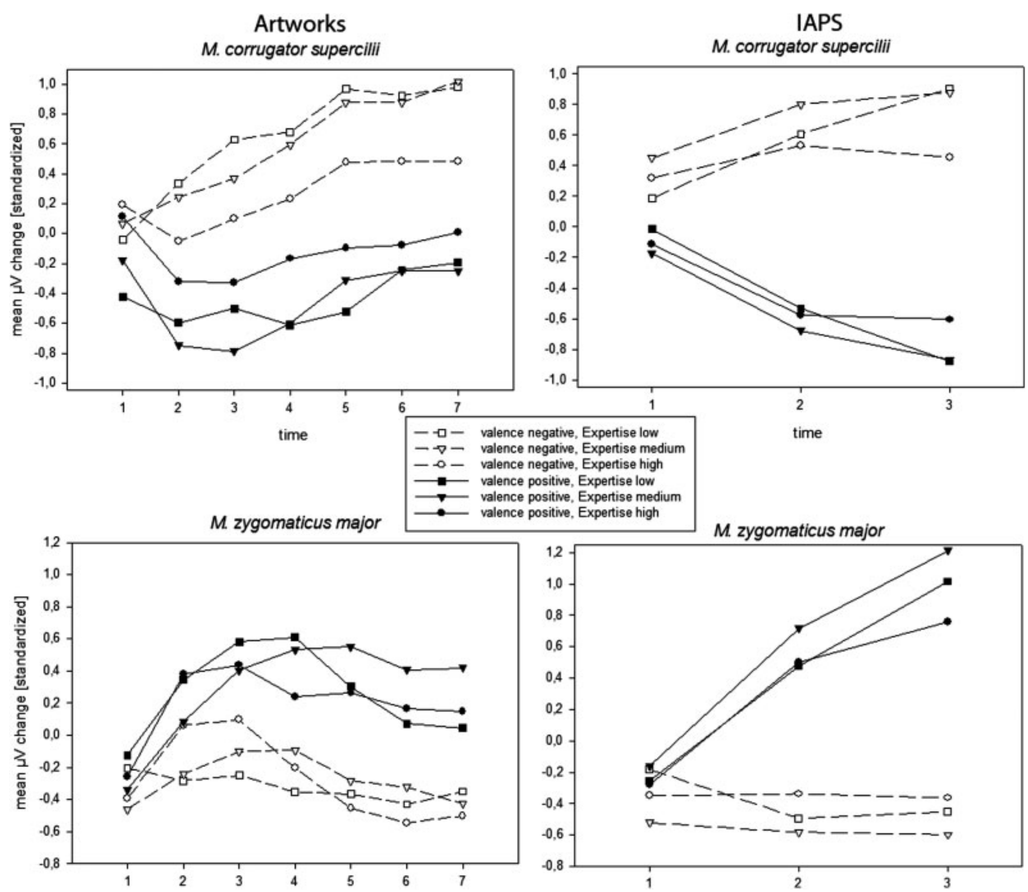

Figure 1. *Facial EMG activations for artworks and IAPS pictures separated by muscle site, expertise and valence.*

the main effect of time and, $F(2, 106) = 51.26$, $p < .001$, $\eta_p^2 = .49$, for the Time × Valence interaction. *Zygomaticus* muscle activity was not modulated by the level of expertise (all *F*s < 1.81 for the main effect and interactions).

EMG responses to artworks

Activity of the *corrugator* was more pronounced for artworks of negative than of positive valence and this difference increased over time, as reflected in main effects of Valence, $F(1, 53) = 90.11$, $p < .001$, $\eta_p^2 = .63$, and Time (7 seconds), $F(2.79, 147.69) = 15.69$, $p < .001$, $\eta_p^2 = .23$, which were qualified by a significant Valence × Time interaction, $F(3.74, 198.24) = 15.32$, $p < .001$, $\eta_p^2 = .23$. There was also a significant interaction between Valence and Expertise, $F(2, 53) = 6.44$, $p = .003$, $\eta_p^2 = .20$. Although all participants showed more corrugator activity for negative than for positive artworks, the degree of activity depended on expertise. For negative-valenced artworks, the high expertise group showed weaker EMG responses (indicating a less negative reaction) than the low ($p = .012$) and the medium ($p = .045$) expertise groups. For positive-valenced artworks, the high expertise group showed stronger EMG responses (indicating a less positive reaction) than the low ($p = .025$) and the medium ($p = .022$) expertise groups (Bonferroni corrected pairwise comparisons). Thus, experts showed a generally less extreme *corrugator* EMG response to positive- and negative-valenced artworks than the medium and low expertise groups. These group differences were constant over time (interaction Valence × Expertise × Time, $F = 1.16$, ns).

For the *zygomaticus*, there were significant main effects for Valence, $F(1, 53) = 28.37$, $p < .001$, $\eta_p^2 = .35$, and Time, $F(3.04, 161.24) = 10.37$, $p < .001$, $\eta_p^2 = .16$, and a significant interaction for Valence × Time, $F(3.82, 202.83) = 6.26$, $p < .001$, $\eta_p^2 = .11$. Artworks with positive valence elicited a stronger increase in the *zygomaticus* response over time than artworks of negative valence. There were no differences among expertise groups in the *zygomaticus* data (all *F*s ≤ 1.81, for the main effect and interactions).

In sum, the facial EMG data show that exposure to positive- or negative-valenced works of art elicit coherent emotional responses, as does exposure to other emotional stimuli. These emotional responses were modulated by the perceiver's level of art expertise. EMG activity of the *corrugator* indicated that the emotional response to art was less extreme—less positive and less negative—in the high expertise group than in the low and medium expertise groups. Similar expertise effects extended beyond artworks and were also observed in participants' *corrugator* activations in response to non-art IAPS pictures.

Ratings

Valence ratings

For both stimulus types, valence ratings were collected indicating how emotionally positive or negative the participants felt while viewing IAPS pictures or artworks. Because of the differences between blocks, valence ratings were analysed separately for IAPS pictures and artworks using mixed ANOVAs with Valence (positive/negative) as a within-subjects factor and Expertise (high/medium/low) as a between-subjects factor.

IAPS pictures. Positive IAPS pictures were rated more positively than negative ones (all mean ratings in Table 1), $F(1, 53) = 1261.64$, $p < .001$, $\eta_p^2 = .96$, for the main effect of Valence. Expertise had no effect (all *F*s < 1.94).

Artworks. Positive artworks were experienced much more positively than negative-valenced artworks, $F(1, 53) = 588.24$, $p < .001$, $\eta_p^2 = .92$, for the main effect of Valence. However, there was a marginally significant interaction for Valence and Expertise, $F(2, 53) = 3.14$, $p = .051$, $\eta_p^2 = .11$. Consistent with the facial EMG results for the *corrugator* muscle, people with high expertise tended to report less extreme emotional feelings than the low and medium expertise groups

Table 1. *Valence (IAPS, artworks), liking, and familiarity ratings (artworks) separated by stimulus valence*

		Valence ratings								Liking ratings				Familiarity ratings			
		IAPS				Artworks				Artworks				Artworks			
		positive		negative		positive		negative		positive		negative		positive		negative	
Expertise	*N*	*Mean*	*SD*	*Mean*	*SD*	*Mean*	*SD*	*Mean*	*SD*	*Mean*	*SD*	*Mean*	*SD*	*Mean*	*SD*	*Mean*	*SD*
low	18	5.22	0.41	1.96	0.50	4.93	0.48	2.43	0.30	4.45	0.71	2.97	0.86	2.33	1.24	1.84	0.98
medium	18	5.34	0.55	1.78	0.33	4.93	0.53	2.54	0.42	4.57	0.58	3.41	0.69	3.43	1.15	2.90	1.23
high	20	5.01	0.51	1.88	0.38	4.65	0.48	2.69	0.51	4.34	0.47	3.81	0.76	3.84	0.77	3.27	1.01

(see Table 1). No other effects were significant, all Fs < 1.

Liking ratings

Liking ratings were collected for the artworks only. Analysing these in a 2 (Valence) × 3 (Expertise) mixed ANOVA revealed a main effect of Valence, $F(1, 53) = 74.67$, $p < .001$, $\eta_p^2 = .50$. In all groups positive artworks were liked significantly more than negative ones (high: $p = .013$, medium: $p < .001$, low: $p < .001$, Bonferroni-corrected comparisons). This effect of valence on liking was modulated by the level of expertise, $F(2, 53) = 5.54$, $p = .007$, $\eta_p^2 = .17$, for the interaction of Valence × Expertise. Bonferroni-corrected pairwise comparisons revealed that the high expertise group liked negative art more than the low ($p = .004$), but not the medium expertise group ($p = .342$). For positive artworks, however, there were no differences among groups (all ps > .727).

Familiarity

Familiarity ratings for artworks were analysed with a mixed ANOVA with Valence (positive/negative) as a within-subjects factor and Expertise (high/medium/low) as a between-subjects factor. Confirming groups' levels of expertise, familiarity increased with expertise, $F(2, 53) = 10.42$, $p < .001$, $\eta_p^2 = .28$ for the main effect of Expertise. However, as can be seen in Table 1, the level of familiarity with the artworks generally was quite low. Even the high expertise group only showed a mean familiarity score of 3.56 on a 7-point Likert scale (1 unfamiliar, 7 familiar). In addition, positive artworks were rated as more familiar than negative artworks, as indicated by the main effect of Valence, $F(1, 53) = 39.25$, $p < .001$, $\eta_p^2 = .43$. However, these differences between positive and negative artworks in familiarity occurred regardless of the level of expertise, $F < 1$, for the interaction Valence × Expertise.

In an exploratory analysis we tested how familiarity affects liking and valence ratings. As only the high expertise group was familiar with a larger number of artworks we restricted the calculation to this group. Based on the high expertise group's mean familiarity score of each artwork, we separated stimuli into 24 familiar and 40 unfamiliar artworks. Liking and valence ratings were separately analysed with repeated-measures ANOVAs with Familiarity (familiar/unfamiliar) and Valence (positive/negative) as within-subject factors. Familiarity had a strong effect on *liking ratings*, $F(1, 19) = 23.64$, $p < .001$, $\eta_p^2 = .55$; familiar artworks were liked more than unfamiliar artworks. There also was a marginally significant Familiarity × Valence interaction, $F(1, 19) = 4.26$, $p = .054$, $\eta_p^2 = .18$. This effect was more distinct for artworks with negative valence ($M_{fam,neg} = 4.36$ vs. $M_{unfam,neg} = 3.60$; *difference* = 0.76; $p < .001$) than for artworks with positive valence ($M_{fam,pos} = 4.49$ vs. $M_{unfam,pos} = 4.15$; *difference* = 0.34; $p = .031$).

The analysis of the *valence ratings* awarded to artworks revealed that familiar artworks were experienced as more positive than unfamiliar artworks, $F(1, 19) = 16.57$, $p = .001$, $\eta_p^2 = .47$. However, a significant Familiarity × Valence interaction, $F(1, 19) = 7.29$, $p = .014$, $\eta_p^2 = .28$, revealed that this was mainly the case for negative-valenced artworks. Artworks with negative valence, when familiar, were experienced as less negative ($M_{fam,neg} = 3.20$ vs. $M_{unfam,neg} = 2.52$; *difference* = 0.68; $p < .001$). Artworks of positive valence were not affected by familiarity ($M_{fam,pos} = 4.73$ vs. $M_{unfam,pos} = 4.57$; *difference* = 0.16; $p = .241$; all pairwise comparisons, Bonferroni corrected).

DISCUSSION

The current study explored whether expertise changes aesthetic experiences and whether such changes, if observed, are limited to perceivers' response to works of visual art or extend to other visual stimuli. Several findings are worth noting. (1) Perceivers of all levels of expertise clearly distinguished between stimuli of positive and negative valence as indicated by valence ratings and facial EMG activations. However, (2) the magnitude of their response depended on their expertise. Specifically, (3) compared to laypeople, experts showed less *corrugator* activation in response to negative stimuli but also less relaxation to positive stimuli, which indicates attenuated emotional responses (Larsen et al., 2003) or changes in cognitive processes (Lishner et al., 2008) or a combination of both. (4) These expertise-related differences in psychophysiological responses were observed for works of visual art as well as for non-art IAPS pictures. In addition, (5) compared to laypeople, experts' valence ratings also showed a trend towards attenuation ($p = .051$)—they provided less extreme valence ratings of negative as well as positive works of art. (6) This expertise-related difference in explicit ratings was not observed for non-art IAPS pictures. (7) Finally, compared to laypeople, experts reported higher liking for negative works of art. We now address several aspects of these findings in more detail.

Experts showed different responses in terms of activation over the *corrugator*, less activation when exposed to artworks with negative content, such as a corpse or a tortured or alienated face, but also less relaxation when exposed to artworks with positive content. The attenuated *corrugator* reactivity in the high expertise group compared to laypersons could be explained by cognitive and emotional processing differences. Art expertise is based on higher-order cognitive processes, such as classifying artworks (beyond familiarity) differentially (Belke, Leder, Harsanyi, & Carbon, 2010). Moreover, experts expect that contemporary art sometimes elicits negative emotions (Leder et al., 2004; Silvia, 2013). Thus, laypeople and experts employ different cognitive evaluations with the same artworks. Furthermore, experts' vast experience in looking and evaluating art might also have reduced cognitive load attenuating the corrugator response (Lishner et al., 2008). Additionally, it is likely that expertise leads to specific emotion-eliciting mechanisms, presumably in terms of particular appraisal profiles. Thus, emotional as well as cognitive processes could have contributed to the reduced corrugator reactivity we observed.

Taking into account that expertise also influenced the valence ratings—as physiological data they were less extreme—our empirical evidence supports the assumption that during the emotional episode cognitive processes—many associated with knowledge and expertise—affect the emotional response (Leder et al., 2004, 2012; Silvia, 2013). Thus, as conjectured by Immanuel Kant (1790/2001) more than 200 years ago, the emotional responses are in accordance with a detached mode, in which expertise weakens the immediate impact of emotions in art. This could also have contributed to the effect that experts liked negative art more. Detaching oneself from the emotional impact of the artwork allows to draw attention to aesthetic qualities by appraising stylistic, formal and contextual (e.g., art historical context) aspects (Cupchik & Laszlo, 1992; Leder et al., 2004; Scherer, 2005).

The higher liking for negative art could be also due to familiarity. By definition, experts are more familiar with art and, indeed, ratings of the familiarity of the artworks presented in this study increased with participants' expertise. This is important because familiarity itself is known to increase liking (Zajonc, 1968), presumably through the higher processing fluency due to repeated exposure (Reber et al., 2004). To address this possible explanation of expertise effects in our data, we analysed experts' responses as a function of their own familiarity ratings. Consistent with earlier findings (for a review, see Reber et al., 2004), experts reported more positive evaluations and higher liking for artworks with which they were familiar than for artworks with which they were not. This effect was stronger for negative artworks.

Nevertheless, familiarity as the sole driving force of the expertise effects fails to account for the full pattern of results as experts showed also an effect for the IAPS pictures, which they hardly could have been familiar with. Although we did not explicitly measure familiarity, it is highly unlikely that our high expertise group has seen these pictures before. These pictures are mainly used in psychological studies and most of our participants, especially the high expertise group solely consisting of art history students, took part in a psychological experiment for the first time. Future research, drawing on a broader range of familiar and unfamiliar art and non-art stimuli, may fruitfully address the role of familiarity in emotional response and its modulation by expertise while also extending the range of dependent variables to measures that are sensitive to stimulus novelty (e.g., pupil dilation or skin conductance). Given the limits of the present data, we cannot assess to which extent recognition or understanding affected experts' emotional response.

Our findings also bear on the domain-specificity of the observed expertise effects. Overall, the artworks we presented elicited weaker emotional responses than the IAPS pictures, in terms of both self-report and physiological response. This may seem unsurprising, given that the IAPS photographs were explicitly developed to elicit strong emotions. Yet, we selected the artworks to match the IAPS pictures in overall level of arousal and valence. That they nevertheless elicited weaker responses is compatible with Frijda and Schram's (1995) assumption that negative emotions are reserved for real life, and that art is milder in terms of emotional response. However, obviously, such conclusions require considerable caution as some artworks (see the Serrano example cited in the introduction) elicit very strong negative emotions, unless the perceiver has arts expertise.

Importantly, experts' weakened emotional response was not limited to artworks but extended to non-art IAPS pictures, designed to elicit emotional responses. This is consistent with Pang and colleagues' (2013) finding that art experts differed from laypeople in the processing of visual, man-made stimuli that are not commonly considered art. Future research may fruitfully explore the generality of this observation. Today, photographs constitute an important class of art and some contemporary exhibitions show more photographs than paintings. Hence, art experts could be experts in a more broadly defined domain of visual stimuli, showing a detached mode of processing whenever they are aware of the graphic quality of pictures. Our experimental design may have fostered such a generalization by always presenting an initial block of artworks, followed by a block of IAPS pictures. This might have potentially invited experts to process the IAPS pictures on more aesthetic grounds. Consistent with this possibility, experts showed similar physiological responses to art and IAPS stimuli, whereas their explicit ratings of valence diverged. Future studies can address issues of familiarity through experimental manipulations, thus separating the effects of domain expertise and previous stimulus exposure (see Leder, 2001).

CONCLUSION

In aesthetic domains, expertise enables specific changes to the experiences of emotional stimuli. This might be what Immanuel Kant (1790/2001) assumed when he proposed a disinterested and detached mode as a defining feature of aesthetic judgements. Our results suggest that aesthetic expertise fosters such a detached mode that attenuates the impact of emotional content on aesthetic evaluation and its physiological correlates. Thus, at least in the arts, in support of Kant's beliefs in the priority of cognition, expertise lowers the immediacy of emotions influencing aesthetic appreciation.

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APPENDIX

Stimulus materials

IAPS positive valence: Nr. 1540, 1600, 1810, 2250, 2370, 2650, 4660, 5260, 5270, 5700, 5870, 7200, 7340, 7350, 7430, 7580, 8090, 8340, 8370, 8380

IAPS negative valence: Nr. 1050, 1275, 2120, 2710, 2730, 2750, 2900, 3550, 6020, 6230, 6370, 6510, 6530, 6550, 9140, 9320, 9400, 9560, 9830, 9910

Artworks

Negative valence: Ahmed Alsoudani, Untitled, 2008; Bacon Francis, Study after Velázquez's portrait of pope innocent, 1953; Jake & Dinos Chapman, I felt insecure II, 2008; Jake & Dinos Chapman, Disasters of war No. 50, 2000; Jake & Dinos Chapman, Great deeds! Against the dead, 1994; Jake & Dinos Chapman, Exquisite corpses I, 2000; Francesco Clemente, Untitled, 1983; Mat Collishaw, Bullet hole, 1988; Damien Hirst, Away from the flock, 1994; Damien Hirst, The physical impossibility of death of someone living, 1991; Bernhard Heisig, Beschäftigung mit Fritz und Friedrich, 1987; Asger Jorn, Lapin, 1962; Attia Kader, Ghosts, 2007; Lousie Bourgeois, Spider, 1997; Willem de Kooning, Woman I, 1950 52; Liu Wie, Indigestion II, 2005; Louise Bourgeois, Le Regard, 1966 Lousie Bourgeois, Arch of hysteria, 1993; Marc Quinn, Self, 1991; Wolfgang Mattheuer, Erschrecken, 1977; Harald Metzkes, Samson und Deliah, 1977; Ron Mueck, Big man, 2000; Wolfgang Mattheuer, Es wächst und wächst, 1973; Marc Quinn, No visible means to escape, 1996; Richter Daniel, Verzerrte Züge, 1999; Sarah Lucas, Wo führt das alles hin, 1995; Jenny Saville, Torso 2, 2004; Jenny Saville, Stare, 2004; Schlichter Rudolf, Der Künstler mit zwei erhängten Frauen, 1924; Shen Shaomin, Unknown Creature – Mosquito, 2002; Willi Sitte, Freiheitsgöttin über Vietnam, 1966; Willi Sitte, Son My, 1970.

Positive valence: Gerhard Richter, Achtzehn Farben, 1966; Theo Balde, Auf der Bank, 1966; Jeff Koons, Ballon dog blue, 1999; Lichtenstein Roy, Brushstroke, 1981; Chris Ofili, Afrodizzia, 1998; Wolfgang Mattheus, Das grüne Vogtlandbild, 1983; Rene Magritte, The voice of blood, 1959; Agam Yaakov, Doppelte Metamorphose, 1969; Theo Balden, Floetenspieler, 1960; Leopold Schropp, Gaia I, 1997; Steven Izenour, Untitled, 1979; Fiona Tan, Lift, 2000; Richard Lindner, Telefon, 1966; Zdenek Sykora, Linien Nr 48, 1987; Mark Tansey, Picasso and Braque, 1992; Beatriz Milhazes, Sinfonia Nordestina, 2008; Anish Kapoor, Mother as a mountain, 1980; Jonathan Meese, Muminbruder, 2000; Anna Musi, Gimme a smooch!, 1999; Keith Haring, Untitled, 1986; Jeff Koons, Puppy, 1997; Jeff Koons, Rabbit, 1986; Rene Magritte, Golconde, 1953; Norman Rockwell, Freedom from want, 1943; Robert Smithson, Spiral jetty, 1999; Richard Paul Lohse, Stufung von Cadmiumgelb zu Orange, 1975; Richard Hamilton, Sunset, 1975; Sidney Goodman, The elements-air, 1993; Takashi Murakami, Tan Tan Bo, 2001; Donald Judd, Untitled, 1987; Gerhard Richter, Vesuv, 1976; Grant Wood, Stone City, Iowa, 1930.