Do happy faces really modulate liking for Jackson Pollock art and statistical fractal noise images?

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Flexas et al. (2013) demonstrated that happy faces increase preference for abstract art if seen in short succession. We could not replicate their findings. In our first experiment, we tested whether valence, saliency or arousal of facial primes can modulate liking of Jackson Pollock art crops. In the second experiment, the emphasis was on testing another type of abstract visual stimuli which possess similar low-level image features: statistical fractal noise images. Pollock crops were rated significantly higher when primed with happy faces in contrast to neutral faces, but not differently to the no-prime condition. Findings of our study suggest that affective priming with happy faces may be stimulus-specific and may have inadvertent effects on other abstract visual material.

Keywords: affective priming, happy faces, abstract art, Jackson Pollock, pink noise

Highlights:

• Facial affective expressions do not modulate preference for Pollock’s art
• “Happy face advantage” hypothesis does not extend to other abstract visual stimuli
• Can evaluation of a piece of art influence how we see subsequent exhibits?

In this study, we tried to replicate findings of Flexas and collaborators (2013) who showed that being briefly exposed to happy faces modulates preference for subsequently seen images of abstract art works by Jackson

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Pollock and Hans Hartung. We wanted to address potential methodological shortcomings we identified in their study that could be the source of noisy measurements and inflated effect size estimates; contrary to common reasoning that a significant result obtained with noisy measurements is evidence for even stronger effects without noise (Fiedler, 2011; Loken & Gelman, 2017; Open Science Collaboration, 2012; van Assen, van Aert, & Wicherts, 2015; Watt & Donaldson, 2016). Rather than following the ‘replication recipe’ (Brandt et al., 2014), i.e. to use exact methods of the original study, we selected a few findings from it and attempted to replicate them in two experiments we devised.

Furthermore, this line of studies is important to gain further insight into how initiated affective processes may bias our aesthetic evaluation of artworks (for a review see Pelowski, Markey, Lauring, & Leder, 2016). Although affective priming research spans decades, the study of Flexas et al. (2013) is among the first attempts at investigating whether priming effects extend to the aesthetics domain and therefore careful examination of their findings is scientifically relevant to the field of aesthetics. A large body of research in behavioural psychology and neuroscience suggests that there is a complex interplay of emotion, perception and cognition (for review see Blanchette & Richards, 2010; Pessoa, 2013; Rolls, 2013, 2015). After Kunst-Wilson and Zajonc (1980) proposed that even a mere exposure can increase preference for previously novel images, Zajonc (1980) posited the ‘affective primacy hypothesis’, suggesting that affective processes can be initiated without the involvement of ‘cognition’ and with ‘minimal stimulus input’. A brief exposure to images with different valences can affect the evaluation of other images that are perceived and processed in temporal proximity (succession); even if the relationship between them is completely irrelevant or not consciously perceived (Blanchette & Richards, 2010; Flexas et al., 2013; Hermans, Houwer, & Eelen, 2001; Klauer & Musch, 2003; Murphy & Zajonc, 1993). One interpretation is that an affect could bias intermediate steps during information processing including encoding and retrieval, which are crucial in decision making (Blanchette & Richards, 2010; Forgas, 1995). Alternatively, a temporal array of images creates ambiguity and observers tend to interpret such events using personal sources of meaning (Fazio, 2001; Payne, Cheng, Govorun, & Stewart, 2005). Abstract art is inherently perceived as ambiguous and therefore preference towards it could be largely context-dependent. The priming paradigm could be suitable to explore factors of preference modulation when viewing abstract art.

**Images of faces as primes**

Time between two appearing stimuli – prime and a target onset asynchrony (SOA) – is pivotal for the strength of affective modulation (Murphy & Zajonc, 1993; Zajonc, 1980). Studies using facial expressions as primes reported strong effects at short (17 ms), as well as at optimal SOAs (1000 ms) (Wong & Root, 2003), suggesting that faces could be ideal primes that exert measurable effect independent of the time lapse between the prime and target. It is argued that
a strong priming effect is expected due to their high evolutionary importance. There is on-going debate whether positive and negative affects are processed faster and therefore considered to be more salient (Krolak-Salmon, Henaff, Vighetto, Bertrand, & Mauguière, 2004; Milders, Srahraie, Logan, & Donnellon, 2006; Öhman, 2009; Rotteveel, Groot, Geutskens, & Phaf, 2001; Schmidt-Atzert, Peper, & Stemmler, 2014; Sweeny, Grabowecky, Suzuki, & Paller, 2009; Werheid, Alpay, Jentzsch, & Sommer, 2005; Wong & Root, 2003).

A meta-analysis of 168 studies on emotion recognition within and across cultures suggests that ‘happiness’ was detected accurately in 79.1%, ‘sadness’ in 67.6%, ‘anger’ in 64.9%, and ‘disgust’ in 60.6% of cases, whereas discrimination of a positive-negative dimension is reported in 54.1% of cases (Elfenbein & Ambady, 2002). Facial affects can be categorised based on their valence and their arousal potential. For example, sadness would have the opposite valence to happiness, whereas anger and disgust would have comparable arousal potential (Fayolle & Droit-Volet, 2014; Russell, 1980). In the study of Flexas et al. (2013), primes comprised happy, disgusted, and neutral facial expressions. Given that the accurate recognition of facial expressions would be a behavioural argument towards their saliency, we opted for expressions with high and comparable recognition rates such as happiness and sadness (opposite valence), anger (instead of disgust, which has similar arousal and same valence), and neutral. It is also recognised that expression of disgust carries less evolutionary importance than the face of anger or fear (Flexas et al. 2013; Wong & Root, 2003).

**Abstract art and statistical noise images as targets: controlling for complexity and low-level visual saliency**

In the original study of Flexas et al. (2013), it was not indicated whether images of abstract art were controlled for their complexity. Previous studies showed that there is a relationship between complexity and preference (Berlyne, 1971; Forsythe, Nadal, Sheehy, Cela-Conde, & Sawey, 2011; Street, Forsythe, Reilly, Taylor, & Helmy, 2016). Studies arguing a linear relationship looked into a larger number of images – natural and artificially generated – with the aim to disentangle mathematical and perceptual complexity in aesthetic preference, as the two are not necessarily closely related (Donderi, 2006; Falk & Balling, 2010; Forsythe, Sheehy, & Sawey, 2003; Osborne & Farley, 1970).

Fractal dimension is one of the measures characterising mathematical complexity. Fractals display self-similarity at both larger and smaller scales. Interestingly, many naturally occurring phenomena possess fractal patterning, including environmental scenes, wave patterns and leaves (Bovill, 1996). Studies found that Pollock’s paintings possess fractal properties similar to ones found in nature (Mureika, Cupchik, & Dyer, 2004; Taylor, 2003; Taylor, Micolich, & Jonas, 1999).

A recent study investigated the relationship between perceptual and mathematical complexity of Pollock’s works (Zanker, Jackson, & Stevanov,
While the fractal dimension was stable for most of Pollock’s works created between 1949 and 1951 (Taylor, 2003), their perceptual complexity deviated from that trend. For the purpose of this study we selected only those works that had similar perceptual as well as mathematical complexity. Works by Hans Hartung were not considered, as his paintings lacked the necessary fractal morphology and differed in terms of perceptual and mathematical complexity from the selected works of Pollock. Instead, we chose artificially generated images of pink noise that possess the same basic amplitude spectrum of natural scenes, but with random phase of spatial frequencies (Burton & Moorhead, 1987; Field, 1987, 1994; Kayser, Nielsen, & Logothetis, 2006; Spehar, Walker, & Taylor, 2016; Torralba & Oliva, 2003). Behavioural and neural evidence suggest that we have a higher preference for stimuli with these properties as the absolute and discriminative visual sensitivity has its peak for pink noise (Hansen & Hess, 2006; Knill, Field, & Kerstent, 1990; Párraga, Troschianko, & Tolhurst, 2000; Spehar et al., 2015; Tadmor & Tolhurst, 1994). Noise, and pink noise specifically, lacks tangible structure due to its random higher-order statistics, presenting a good candidate for affective primes and it is also congruent with the underlying structure of Jackson Pollock’s drip paintings.

Furthermore, Flexas et al. (2013) did not indicate whether their stimuli were controlled for low-level features such as luminance and contrast. The human visual system gathers and sums information through deployment of attention. Although it is still unclear what determines where attention will be directed, we know that it could be influenced by the low-level salience of visual stimuli, such as luminance, contrast, and colour (Wolfe & Horowitz, 2010). More salient images get more fixations and preference is biased towards images that are looked at for a longer time (Krajbich, Armel, & Rangel, 2010). In our study, we transformed all stimuli into greyscale; mean luminance and contrast were matched for all primes and targets.

**Controlling for the affective state of participants**

Flexas and collaborators (2013) did not measure the affective state of participants. Controlling for this might be important as unusually elevated positive or negative affect might bias preference for targets. We administered the Positive and Negative Affect Schedule (PANAS) which is a widely used self-report measure of affect (Watson, Clark, & Tellegen, 1988). In both studies, we used the validated German translation by Krohne, Egloff, Kohlmann, and Tausch (1996). The questionnaire consists of 20 items measuring positive and negative affect, 10 for each subscale. Participants are asked to rate their current mood on a five-point Likert scale (1 = “not at all”, to 5 = “extremely”). Ratings for each scale are summed to calculate the subscale score for positive and negative affect, respectively. In our studies, we administered PANAS before and after experimental trials to screen for unusually large oscillations in affective states of participants during the experiment.
Experiment 1

We probed for a happy face-advantage in modulation of preference for Pollock crops. If valence of happy faces facilitates higher preference for Pollock crops, then faces with sad expressions should have the opposite effect and the preference is expected to be significantly lower than that observed in the condition with both the neutral and happy primes.

Methods

Participants. 38 students of different majors (psychology, law, philosophy, economics, arts, sports and business) from Johannes Gutenberg University of Mainz participated in the experiment. Participants gave written informed consent to voluntary participation in accordance with the ethical standards stated in the Declaration of Helsinki. There was no monetary compensation for their participation. Participants with any level of art expertise, formal training in art and those strongly familiar with Pollock’s works were excluded from further data analysis. All subjects had normal or corrected-to-normal vision.

Participants whose standardized values of either positive or negative affect exceeded 2.50 SD were excluded, as well as those who had more than 2 SD change in PANAS scores before and after the testing. Eight participants were excluded from data analysis: six due to extreme values on the PANAS scale, one due to uncorrected ametropia and one for missing data. Age of participants ranged from 19 to 47 years ($M = 23.17$ years, $SD = 5.63$ years, 22 females).

Targets. 12 square crops were taken from three paintings by Jackson Pollock: Number 8 (1949; Pollock, 1980), Number 32 (1950; Prange, 1996), and Autumn Rhythm (1950; Januszcak, 1981). These had similar perceptual and mathematical complexity (Zanker et al., 2016). Mean luminances of images were equalised using the SHINE toolbox (Willenbockel et al., 2010), setting it to $M = 128$ and $SD = 64$ (see Appendix A).

Primes. 16 images of faces with happy, sad, angry, and neutral expressions; four gender-balanced images per facial expression were selected from the validated FACES database (Ebner, Riediger, & Lindenberger, 2010). We chose young faces in order to make the average age of participants and primes comparable. Images were then transformed to grayscale and equalised with the SHINE toolbox (Willenbockel et al., 2010), with luminance $M = 128$, $SD = 64$ (see Appendix B).

Procedure. Participants were seated approximately 50 cm in front of a 19-inch Dell TFT monitor, with 1280×1024 pixels screen resolution and a refresh rate of 60 Hz. Stimulus presentation and data collection was done in Millisecond Inquisit 5 (2016). Participants were instructed to maintain an upright position with their body leaning on the table’s edge to ensure constant viewing distance. Participants first completed PANAS scales, followed by a practice session, which included crops from images of works by Pollock that were not used in experimental trials. The experimental block had 48 trials in total: each of the 12 crops was shown four times and each of the 16 facial expressions were presented three times. Every target was paired with every prime condition, but not with every prime image. Selection of prime images was done randomly from the pool of face images with the same facial expression. The trial order was randomised for each participant. A fixation cross was presented for 500 ms, followed by a prime (300 ms), after which the target was shown for indefinite time (cf. Figure 1). Primes and targets (512 × 512 pixels) were presented on a mid-gray background, subtending a visual angle (h×w) of 15.53°. Participants were asked to indicate how much they like the target image on a 5 point-Likert scale presented below the target on the same screen. Points on the Likert scale had numbers and an explanation to what numbers denote:
e.g. 1- do not like it at all; 5-like it very much. They were instructed to answer promptly and spontaneously, by clicking on the number that corresponds to their impression. After the experimental block, participants were asked about their age, sex education, art expertise, familiarity with works of Jackson Pollock, and visual acuity.

We were particularly interested in replicating the stronger priming effects reported in the original study in the condition with optimal SOA (300 ms). Flexas and collaborators (2013) did not provide detailed information about their experimental equipment. Specifically, we were concerned that a SOA of 20 ms could not be reliably deployed, as it requires non-standard equipment. For example, in case of a display with a typical 60 Hz, the screen is refreshed every ~16.67 ms. Without software calibration, a fitting graphics adapter and an adequate display it is not possible to synchronise the frame rate and the presentation of primes absolutely precisely to the timeline; Secondly, there are numerous studies that showed that priming effect with faces remains detectable at short (Murphy & Zajonc, 1993; Zajonc, 1980) and long SOA, even up to 1000 ms (Hsu, Hetrick, & Pessoa, 2008; Wong & Root, 2003; Li, Zinbarg, Boehm & Paller, 2008), hence we did not introduce a more systematic variation of SOA lengths.

Figure 1. Priming procedure in (upper row) Experiment 1 and in (bottom row) Experiment 2.

Results

Statistical data analysis was performed using SPSS, version 23. To ensure that ratings of targets reflect first impressions of participants, we excluded answers below 300 ms and above 3000 ms; with this cut-off, 19% of the answers were excluded from further analysis. In the original study of Flexas and collaborators (2013), the cut-off was set to 2000 ms. The same cut-off value would have discarded 42% of our data.

All target images were treated equally and preference ratings were averaged per priming condition. We performed a repeated-measures analysis of variance with four facial expressions (happy, sad, angry, neutral) as within-subject factors. There were no significant differences in preferences of Pollock
crops between conditions using happy primes ($M = 2.64, SD = 0.69$), sad primes ($M = 2.53, SD = 0.57$), angry primes ($M = 2.43, SD = 0.61$) and neutral primes ($M = 2.51, SD = 0.62$), $F (2.24, 65.09) = 1.14, p = .329$. The effect size was $\eta^2_p = .038$. Mauchly’s test indicated that the sphericity assumption was violated ($p = .004$), therefore Huynh–Feldt correction was applied ($\varepsilon = .748$). Planned contrasts of happy primes against all other primes did not isolate any significant differences either ($\eta^2_p = .021 – .061$). Similarly, neutral primes did not differ from any other primes ($\eta^2_p = .002 – .061$). Mean preference ratings are shown in Figure 2.

![Figure 2](image)

*Figure 2.* Mean preference rating of Pollock’s crops with different preceding facial primes (error bars indicate the SEM).

The within-subject analysis included the scores of the two subscales of the PANAS, before and after experimental trials, as can be seen in table 1.

<table>
<thead>
<tr>
<th>Descriptive statistics of the PANAS subscales (mean with standard deviation in parentheses)</th>
<th>Experiment 1</th>
<th>Experiment 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>pre</td>
<td>post</td>
</tr>
<tr>
<td>positive affect</td>
<td>25.00 (7.01)</td>
<td>22.40 (7.30)</td>
</tr>
<tr>
<td>negative affect</td>
<td>14.10 (4.19)</td>
<td>14.13 (4.19)</td>
</tr>
</tbody>
</table>

Positive affect in the first experiment decreased over the course of the experiment most likely due to fatigue, however there was no significant change in negative affect, $t (29) = 2.05, p = .049$.

In summary, results of Experiment 1 did not isolate significant priming effects using happy, sad, angry or neutral facial expressions at optimal SOA (300 ms) to modulate preference for images of Pollock crops. The finding of Flexas and collaborators (2013), in favour of the happy-face advantage was not replicated in our experiment.
Experiment 2

The second experiment was designed to test whether results of Experiment 1 were stimulus-specific and whether happy face-primacy could be context-dependent. For instance, affective response to a painting might be unaffected by positive primes, but a positive prime could cognitively bias observers towards the high end of the rating scale. We investigated affective priming by adding another type of abstract targets, statistical images of pink noise. These are comparable to Jackson Pollock’s crops in mathematical complexity (fractal nature) and energy distribution ($\alpha = 1$), but do not possess the same representational structure typical for abstract or figurative art.

We tested the happy face-advantage only against neutral prime and no-prime baseline conditions, where we expected to see no difference between conditions with neutral prime and no-prime. However, if happy faces would drive ratings for targets towards the higher end of the response scale, we should expect a significant difference between no-prime and happy prime conditions.

Method

Participants. 43 students from Johannes Gutenberg University of Mainz participated in the second study. Participants gave written informed consent to voluntary participation in our experiment that is in accordance with the ethical standards of psychological research. Nine participants were excluded from data analysis: three art experts, two due to visual impairment, three due to extreme values on the PANAS scales and one for having particular preference for images of noise. The age of participants ranged from 20 to 49 years ($M = 25.94$ years, $SD = 5.88$ years, 20 females).

Targets. 12 crops from another three paintings by Pollock were selected as target stimuli: Number 4 (1950; Fondation Beyeler, 2008); Lavender Mist (1950; Pollock, Varnedoe, & Karmel, 1998–1999); and Autumn Rhythm (1950; Janusczcak, 1981). 12 artificial images of pink noise were created using a method proposed by Lennon (2000) and adapted by Yearsley (2004) in MATLAB 2014b (The MathWorks Inc., Natick, MA) (see Appendix A).

Primes. Additional four images of happy and neutral, female and male faces from FACES database (Ebner et al., 2010) were added to the set of primes used in Experiment 1, yielding a total of 16 facial primes (8 happy and 8 neutral facial expressions). All images of primes and targets were converted to grayscale and equalised with the SHINE toolbox (Willenbockel et al., 2010), with luminance $M = 128, SD = 64$ (see Appendix B).

Procedure. The procedure was similar to Experiment 1 (cf. Figure 1). The experimental block had 72 trials in total; every target (24) was paired with every prime condition: happy, neutral, and no-prime condition (prolonged fixation cross). No-prime condition was added to the design as neutral faces can be perceived as faces with negative valence (Lee, Kang, Park, Kim, & An, 2008). Our intent was to test affective primes against a no-valence condition. Images of primes were selected randomly from the set of 8 happy and neutral face images, respectively. The trial order was randomised for each participant.

Results

We used the same cut-off for response latency as in Experiment 1. Responses below 300 ms and above 3000 ms were discarded, thus 15% of the answers were excluded from further analysis. Responses were collapsed across
categories of pink noise and abstract art, followed by averaging per priming condition.

Distribution of responses for images of abstract art followed a normal distribution, whereas the floor-effect limited the variance of ratings for images of pink noise, but still followed the trend of a half-normal distribution. Therefore, we proceeded with a repeated-measures analysis of variance with prime conditions (happy face, neutral face, no prime) and two types of targets (pink noise, Pollock crops) as within-subject factors. Mauchly’s test confirmed that all variables satisfied the assumption of sphericity, $p > .05$.

Participants significantly better liked images of abstract art ($M = 2.76$, $SE = .161$) than images of pink noise ($M = 1.87$, $SE = .15$) as confirmed by an ANOVA, $F (1, 33) = 17.28$, $p < .001$, $\eta_p^2 = .344$. There was a significant main effect of facial prime $F (2, 66) = 3.94$, $p = .025$, of medium effect size ($\eta_p^2 = .107$; Cohen, 1988). Bonferroni-corrected post-hoc analysis did not find significant differences between any prime conditions: Happy primes $M = 2.36$, $SE = .12$; Neutral primes $M = 2.24$, $SE = .10$, No-prime $M = 2.33$, $SE = .11$. Only planned contrasts revealed that neutral facial primes produced significantly lower estimates in comparison to happy primes, $F (1, 33) = 5.63$, $p = .024$, $\eta_p^2 = .146$), and no-prime conditions, $F (1, 33) = 4.95$, $p = .033$, $\eta_p^2 = .130$. However, there was no statistical difference between the happy and no-prime condition.

Furthermore, the analysis showed a significant interaction term of prime $\times$ target, $F (2, 66) = 6.22$, $p = .003$, with medium effect size $\eta_p^2 = .159$. Contrasts revealed that in the no-prime condition Pollock crops were rated significantly higher than in the neutral prime condition, while pink noise ratings remained the same, $F (1, 33) = 10.36$, $p = .003$, $\eta_p^2 = .239$. Mean preference ratings for the second experiment are shown in Figure 3.

![Figure 3. Mean preference ratings by facial prime and target (error bars indicate the standard error of the mean).](image-url)
In addition, both positive and negative affect of participants measured by PANAS decreased over the course of an experiment, $t(33) = 2.83, p = .008$ and $t(33) = 2.75, p = .01$, respectively, most likely due to fatigue (Table 1).

In summary, results of Experiment 2 did not confirm that neutral facial primes correspond to no-valence primes. The largest effect estimates were isolated when comparing the effect of neutral primes against positive primes and the no-prime baseline, on ratings of both images of abstract art and artificial noise images, as opposed to happy and no-prime conditions. In addition, results suggest that positive primes do not initiate a visual response bias towards higher numbers of the rating scale, as no post-hoc comparisons or planned contrasts revealed significant differences between happy primes and the no-prime condition.

Discussion

Our primary aim was to suggest methodological improvements to the study of Flexas et al. (2013) and then investigate whether happy faces take primacy in modulation of aesthetic preferences – a major finding put forward by their study. We introduced several measures to control for possible confounding effects of low-level visual features of the stimuli set (perceptual / mathematical complexity, luminance, contrast and colour) and possible noise introduced by participants having unusually elevated positive or negative affective state before taking part in our experiments; this would potentially bias their aesthetic judgments.

In two experiments, we investigated whether images of abstract artworks by Jackson Pollock would be rated higher when primed with happy faces in comparison to faces having negative valence and arousal; or in the context of other types of abstract stimuli. In the first experiment, we tested a priming potential of several facial expressions, including those with negative valence such as sadness and anger. Negative valence of facial expressions did not yield significant effects, nor did high arousal (anger) have any differential impact on preference for images of abstract art. Furthermore, the priming effect of neutral facial expressions did not differ from sad, angry, or happy ones.

In the second experiment, we introduced images of statistical fractal noise to see whether the ‘happy face advantage hypothesis’ can be extended to images with higher ambiguity than Jackson Pollock’s art due to their obvious lack of tangible structure. Noise images may be susceptible to stronger affective priming modulation (Payne et al., 2005), while they share the same low-level properties with Pollock’s artworks (Spehar et al., 2015; Taylor et al., 1999; Zanker et al., 2016). We contrasted happy and neutral facial primes against the baseline condition (no-prime). An interesting finding is that neutral faces lowered the preference for both images of abstract art and artificial noise, whereas happy faces did not increase the preference. This finding goes along with the study of Lee et al. (2008) who demonstrated that neutral faces are judged as faces with negative valence in the context of positive facial expressions. Furthermore, an
exploratory post-hoc analysis did not show any significant differences between primes, only the planned contrasts between happy and neutral prime conditions revealed medium size effect on ratings of targets.

We recognize the possibility that the correction for multiple comparisons could have been too strict and a larger sample would have provided a higher power. Using a priori power analyses to determine a suitable sample size for both experiments, we determined that 28 participants would be an optimal number to show a small effect size (.02 as measured by partial-eta square; Cohen, 1988); assuming within-subject factor with four levels and violated assumption of sphericity. Similarly, the optimal sample size would approximate to 22 participants for the same effect size in the within-subject design (2×3) used in the second experiment. The sample size in both of our experiments exceeds the recommended number; it is possible that not all variance was sampled otherwise found in population, as students form a rather homogenous sample.

Considering the replicability and reproducibility debate in psychology, our study adds to the discussion of the ‘replication crisis’ as well as to the ‘crisis of replication’; the probability of capturing the real effect can be increased only with the larger number of replications and examining effects by considering data from all studies (Open Science Collaboration, 2012; Watt & Donaldson, 2016).

On a more general note, the study of Flexas et al. (2013) asked an interesting question: Can an affective state induced by one artwork influence the aesthetic experience of other artworks if put into the same context? Although we agree that the priming paradigm is widely used to probe to which extent already initiated affective processes can influence our subsequent valuation, it is hard to extrapolate findings of priming studies to answer a very general question: does evaluation of one piece of art impact the evaluation of other artworks? Most obviously, spectators are allowed indefinite time to inspect artworks in museums. The strength of preference modulation with brief exposures to emotionally loaded stimuli is more likely to dissipate over the period of a few seconds. Another question is what are the relevant emotionally loaded stimuli that may exert robust influence on our preference for artworks? Faces have evolutionary importance and numerous studies demonstrated strong and prolonged impact on affective modulation of preferences (Rotteveel et al., 2001; Sweeney et al., 2009; Wong & Root, 2003). However, negative faces are primarily relevant in the context of social evaluation (Öhman, 2009). If context matters, then it is worth noting that abstract art would be rarely coupled with portraits at museum exhibitions. Further studies could take into account different modalities of primes (e.g. semantic priming, auditory priming).

Finally, the results of our study would suggest that affective priming with faces may be stimulus-specific and may have inadvertent effects on other abstract visual material. The question of carry-over effects involving sequential aesthetic experiences within the museum context should also be probed with different paradigms, other than priming ones.
References


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Appendix A

Images of crops from paintings by Jackson Pollock used as targets in both experiments. Image source: Kunsthistorisches Institut der Universität zu Köln (Ed.), Prometheus. Bildarchiv für Kunst- und Kulturwissenschaften. Köln

Number 8 (1949; Pollock, 1980)

Number 32 (1950; Prange, 1996)

Autumn Rhythm (1950; Janusczak, 1981)

Number 4 (1950; Foundation Beyeler, 2008)

Autumn Rhythm (1950; Janusczak, 1981)

Lavender Mist (1950; Pollock, Varnedoe, & Karmel, 1998-1999)
Statistical Pink Noise Images used as targets in Experiment 2.
Appendix B

Pool of primes used in both experiments. Images retrieved from the validated FACES database, with 50% of the selected images depicting men (Ebner, Riediger, & Lindenberger, 2010)

Facial expressions of happiness

Facial expressions of sadness
Facial expressions of anger

Neutral facial expressions