

Trait mindfulness predicts frequency of aesthetic experiences

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The Observing facet of trait mindfulness predicts frequency of aesthetic experiences evoked by
the arts

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Neil R. Harrison declares that he has no conflict of interest.

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Abstract

Mindfulness can foster an enhanced sensitivity to internal and external impressions, which could result in heightened subjective responses to works of art. So far though, very little is known about the connection between mindfulness and aesthetic responses to the arts, therefore the current study aimed to investigate whether there was an association between trait mindfulness and how often people report aesthetic experiences. We hypothesized that the Observing facet of mindfulness would positively predict the self-reported frequency of aesthetic experiences (aesthetic chills, feeling touched, and absorption). Participants in an online study (N = 207) completed the Five Factor Mindfulness Questionnaire, an Aesthetic Experiences scale in relation to the area of the arts a participant encountered most frequently in their daily life, and a measure of aesthetic expertise. Controlling for aesthetic expertise and sex, linear regression revealed that the Observing facet of mindfulness was positively associated with aesthetic experience, as predicted. Non-reactivity positively predicted aesthetic experience, while Non-judging was negatively associated with aesthetic experience. Potential explanations for the association between these three facets of trait mindfulness and aesthetic responses are discussed in relation to information-processing models of aesthetic experience. The findings provide preliminary support for the premise that levels of dispositional mindfulness are associated with the frequency of intense emotional responses to the arts, and recommendations for further research studies are outlined.

Introduction

Works of art can sometimes elicit powerful peak experiences involving profound emotional states such as awe and wonder. Intense subjective responses to works of art often are not only highly pleasurable, but also have the ability to transform our experience and provide meaning and value in our lives (Pelowski & Akiba, 2011). Indeed, aesthetic experience has even been described as being “as important to human life as sex, hunger, aggression, love, and hate” (Hagman, 2011, p1). Appreciation of beauty has been shown to be related to increased life satisfaction, as one of the character strengths in the Values in Action (VIA) classification developed by positive psychologists (Park, Peterson, & Seligman, 2004).

In order to deeply engage with a work of art, it is thought that one must first step out of a pragmatic, goal-oriented state of mind (Cupchik & Winston, 1996). This motion away from a results driven mindset finds a parallel in the attitude of mind that is cultivated in the practice of mindfulness, where a ‘non-striving’, present moment-oriented attitude towards experience is adopted (Kabat-Zinn, 1994). Moreover, aesthetic experience has been characterised as a psychological process where attention is focused on the artistic object while all other objects, events, and everyday concerns are ignored (Cupchik & Winston, 1996). Similarly, one of the goals of mindfulness meditation is to anchor the attention to a particular object or process, such as the sensations of breathing. These observations hint at a potential association between mindfulness and aesthetic experience.

Aesthetic experience is a response to a work of art that is qualitatively more than mere preference or liking (Vessel, Starr & Rubin, 2013). It has been viewed as an “exceptional state of mind” (Marković, 2012, p. 2), although the extent of its uniqueness and difference from experience evoked by everyday situations is disputed (Chatterjee, 2011). Intense aesthetic experiences can include a variety of emotional reactions such as shivers, losing track of time,

losing awareness of one's surroundings, and feelings of awe. Such affective responses to the arts appear to be common; Sloboda (1991) reported that 90% of respondents in a survey sample experienced shivers down the spine and 62% reported experiencing goose bumps while listening to music during the previous five years. Although music is usually the most frequent elicitor of aesthetic responses, it has been shown that other domains of the arts such as film, visual art, and literature, can also elicit profound aesthetic experiences (Goldstein, 1980; Huron & Margulis, 2010). Researchers in the field of emotion and aesthetics have begun to elucidate the characteristics of intense responses to art. Three interrelated but discrete categories of special aesthetic states have recently been proposed: aesthetic chills (goose bumps on the skin, most commonly on the scalp, neck, back, and arms (Nusbaum et al., 2014)), feeling touched and moved, and absorption in the work of art (Silvia & Nusbaum, 2011).

An individual differences approach has been adopted in several studies to investigate which factors influence the frequency with which people report aesthetic experiences (McCrae, 2007; Nusbaum & Silvia, 2011; Silvia & Nusbaum, 2011). Openness to experience (a personality trait that is characterized by curiosity and receptivity to new experiences (Costa & McCrae, 1992)) was reported as a predictor for experiencing aesthetic chills in both survey and experimental studies (Colver & El-Alayli, 2015; McCrae, 2007; Silvia & Nusbaum, 2011). Expertise in art and music, and gender, have been found to influence the frequency of aesthetic responses (Kozbelt & Seeley, 2007); those scoring high in aesthetic expertise, and women, have reported relatively higher aesthetic experience scores (Silvia & Nusbaum, 2011). Together these studies provide strong evidence that individual differences influence the frequency of aesthetic responses to the arts. Nevertheless, this field of research remains in its infancy.

Mindfulness (i.e., "paying attention in a particular way: on purpose, in the present moment, non-judgementally" (Kabat-Zinn, 1994, p4)) can refer to a dispositional tendency in which

people naturally vary (Baer, Smith, & Allen, 2004; Brown & Ryan, 2004). Trait mindfulness is most often considered as a construct composed of several facets, and these facets can be measured using the Five Facet Mindfulness Questionnaire (FFMQ) (Baer et al., 2004; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). The FFMQ contains the following subscales: observation of sensations, thoughts, and feelings (Observing), describing experiences with words (Describing), performing acts with awareness and concentration (Acting with awareness), non-judging of inner experience (Non-judging), and non-reactivity to inner experience (Non-reactivity) (Baer et al., 2006).

Mindfulness should facilitate a heightened receptivity to present moment events and induce an attitudinal stance of openness towards experience (Kabat-Zinn, 1994, 2005). In principle, when attention is focused on present moment experience, there should follow a greater sensitivity and receptivity to sense perceptions, that may enhance the capacity to perceptually engage with and respond more deeply to a work of art (Anicha, Ode, Moeller, & Robinson, 2012). Several influential information-processing accounts of aesthetic experience highlight the pivotal role of perceptual processing and attentional mechanisms in the generation of the aesthetic response (Chatterjee, 2011; Cupchik & Winston, 1996; Leder, Belko, Oeberst, & Augustin, 2004; Marković, 2012). In Cupchik and Winston's (1996) account of aesthetic experience the generation of aesthetic experience requires top-down control to redirect attention towards the sensory properties of the artwork, and top-down attentional control (i.e., executive attention) is known to be improved following mindfulness meditation training (Tang, Hölzel, & Posner, 2015).

Considered as a whole, the above theoretical considerations are suggestive of a link between mindfulness and aesthetic processing, therefore it is rather surprising that almost no empirical investigations have thus far been conducted in this area. An initial study by Diaz

(2013) investigated the effect of mindfulness on aesthetic responses, where aesthetic responses to music were obtained for a group of trained musicians that had received a body-scan mindfulness induction, and for a control group of trained musicians that had received no induction.

Participants' aesthetic responses were measured using a Continuous Response Digital Interface (CRDI) to track the ongoing magnitude of responses to the construct of 'aesthetic response' while they listened to a musical extract. Perceived magnitude of attention and overall magnitude of aesthetic response were collected after listening to the music via a self-report questionnaire using a Likert-type scale (Diaz, 2013). Data from the CRDI revealed that the magnitude of aesthetic response was increased in the mindfulness group compared to the control group, although no differences were observed in the questionnaire data. Participants' verbal accounts following the experiment revealed that mindfulness may have improved attentional focus, decreased distraction, and improved participants' awareness of the qualities of the music. Although the study lacked a clear definition of what constituted an aesthetic response, and despite the qualitative nature of some of the data, nevertheless the results provided an indication that mindfulness can potentially enhance aesthetic responses, at least in relation to music. It remains unclear from the study, though, which aspects of mindfulness led to the increased aesthetic responses.

The current study investigated the association between the facets of dispositional mindfulness and the frequency of aesthetic experience evoked by the arts. We hypothesized that participants who scored higher on the Observing facet of the FFMQ would report more frequent aesthetic responses to the arts. In addition, we aimed to conduct an exploratory investigation into the association between the other four facets of the FFMQ (Describing, Acting with awareness, Non-judging, and Non-reactivity) and aesthetic experience, and explore the association between

the five facets of the FFMQ and the subscales of the Aesthetic Experience Scale (Chills, Touched, and Absorption).

Method

Participants

An online survey, titled “Art and Mindfulness”, was advertised at a University in North-West England to students who could participate in exchange for course credit. The survey was also advertised to the wider community via a psychology research participation website. 248 participants completed the survey, and after excluding participants who reported meditating regularly, the final sample consisted of 207 volunteers (mean age = 23.7 years (SD = 9.9); 159 female, 48 male). 87% of the final sample reported either having a university degree or were currently studying for a degree. The participant information sheet and other relevant ethical information was on the first page of the survey, and after completing the survey participants were thanked and presented with a full debrief. Ethical approval for the study was obtained from the Psychology Department ethics committee at Liverpool Hope University and all participants provided informed consent.

Procedure

Participants completed an online survey consisting of measures to assess dispositional mindfulness, aesthetic experience, and aesthetic expertise. All participants completed these scales in the same order.

Measures

Mindfulness

Dispositional mindfulness was measured using the Five Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2006). The FFMQ consists of 39 items measured on a five-point Likert-type scale ranging from 1 (never or very rarely true) to 5 (very often or always true). It assesses the tendency

to think and behave mindfully in daily life. Scores were calculated for each facet of mindfulness (Observing, Describing, Acting with awareness, Non-judging, and Non-reactivity), with higher scores indicating greater levels of mindfulness. The subscales exhibited good reliability in our sample (alpha values from .81 to .92; see Table 2).

Aesthetic experience

The frequency of experiencing aesthetic states was measured using the Aesthetic Experiences Scale (AES) (Silvia & Nusbaum, 2011). This is a 10-item self-report scale which measures the frequency of experiencing unusual aesthetic responses. Previous studies have reported good reliability for the AES ($\alpha = .87$ (Silvia & Nusbaum, 2011) and $.85$ (Nusbaum & Silvia, 2011)), and the scale also exhibited good reliability in the current sample ($\alpha = .88$). Factor analysis confirmed three subscales of the AES (Silvia & Nusbaum, 2011); these subscales were *Chills* (“feel chills down your spine”; “get goose bumps”; “feel like your hair is standing on end”), *Touched* (“feel like crying”; “feel touched”), and *Absorption* (“feel absorbed and immersed”; “completely lose track of time”; “feel like you’re somewhere else”; “feel detached from your surroundings”; “feel a sense of awe and wonder”). Prior to completing the 10-item scale, a preliminary question (Q1) asked “Please write down which area of the arts you encounter most often in your daily life”. Responses to the AES were measured using a 7-point Likert-type scale ranging from 1 (“Never”) to 7 (“Nearly Always”), and participants were asked to respond with reference to the area of the arts that was reported in Q1.

Aesthetic fluency

Familiarity with the arts was measured using a modified version of the aesthetic fluency scale (Smith & Smith, 2006), a knowledge-based self-report assessment of expertise in the arts. This scale has been shown to have good reliability and validity (Smith & Smith, 2006). Several researchers have adapted the scale to include items related to domains other than visual art (Silvia,

2007; Silvia & Barona, 2009). In the current study, the scale consisted of 5 items related to visual art (e.g., “Impressionism”), and 5 items related to music (e.g., “Baroque music”), to ensure that the modified scale measured knowledge of music, which has been found to be the most frequently reported domain of the arts encountered in everyday life (Silvia & Nusbaum, 2011). A total score was calculated, with higher scores reflecting greater aesthetic fluency, and the scale exhibited good reliability in the current sample ($\alpha = .88$). The ten items were presented using a five-point Likert-type scale ranging from 0 (“I have never heard of this artist/musician or term”) to 4 (“I can talk intelligently about this artist/musician or term”).

Data Analyses

In a first step we explored the primary hypothesis that Observing would significantly predict overall Aesthetic Experience (AE), using a regression analysis that included Observing as the primary predictor and the control variables Aesthetic Fluency and Sex. In a second step, we explored the unique contribution of each of the five facets of the FFMQ to the prediction of overall AE, while controlling for Aesthetic Fluency and Sex in a regression model. We then ran a final regression analysis using the three subscales (Chills, Touched and Absorption) of the AES as outcome variables, to explore the extent to which these three variables were predicted by the FFMQ subscales, while controlling for Aesthetic Fluency and Sex.

Measuring both predictors and outcome variables using self-report scales may result in common method variance (CMV) (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). To decrease the possibility of CMV, we ensured responses were confidential to each respondent to reduce social desirability and respondent leniency (Podsakoff et al., 2003). Also, the FFMQ contains negatively worded items, and the FFMQ and the AES have different scale endpoints, both of which reduce CMV (Podsakoff et al., 2003). We performed Harman’s single factor test as a post-hoc statistical test to check for CMV. This procedure involves conducting an unrotated exploratory

factor analysis on all of the items collected for the study (excluding socio-demographic items). Results indicated that our data converged into 16 factors, and that the first one explained only 21.3% of the variance. Taken together, these considerations strongly indicate that risks of CMV are reduced in our data.

Results

The categories of arts encountered most often in daily life and their associated frequencies are shown in Table 1. Table 2 provides descriptive statistics and observed alphas for the FFMQ, AES and Aesthetic Fluency scales and all associated subscales, showing a high level of reliability for all scales and subscales (with the exception of AES Touched ($\alpha = .667$)). In addition to calculating the observed alpha values for each subscale we also calculated inter-factor correlations using Pearson's correlational tests (Table 3). This showed low correlations between the subscales of the FFMQ, and moderate correlations between the subscales of the AES.

Table 1 Frequencies of reported art domains

Domain	N
Music	112
Visual Art	25
Motion picture media (e.g., TV, film)	17
Reading	13
Dance	4
Theatre	3
Listed a creative process	10
Obscure, hard to classify	23

Model 1 explored the primary hypothesis that Observing would significantly predict overall Aesthetic Experience (AE). The model included Observing as the primary predictor and

also included the control variables (Aesthetic Fluency and Sex). Observing significantly predicted AE, $F(3,203) = 12.391$, $MSE = 1423.747$, $p < .001$, $\eta^2 = .039$, accounting for 14.2% of the variance (adjusted r Square) (see Table 4). Model 2 explored how all of the five facets of the FFMQ predicted overall AE. The model included seven predictor variables: the five FFMQ subscales, Aesthetic Fluency, and Sex. The results indicated that the model significantly predicted AE, $F(7,199) = 9.299$, $MSE = 105$, $p < .001$, $\eta^2 = .246$, accounting for 22.0% (adjusted r Square) of the overall variation. Table 4 shows that Observing, Non-judging, Non-reactivity and Aesthetic Fluency were all significant predictors of AE. As all predictors were entered into the regression model simultaneously, Table 4 reveals the unique contribution of each predictor after controlling for the other predictor variables. Table 4 also reports the multicollinearity statistics (Tolerance and Variance Inflation Factor (VIF)) for the predictors in Models 1 and 2. The VIF values were well below 10 (all VIFs < 1.49) and the tolerance statistics were all above 0.2 (all values $> .67$), indicating that there was no multicollinearity in the data (e.g., Field, 2012).

Table 2 Descriptive statistics and alpha values for the FFMQ, AES, Aesthetic Fluency and associated subscales

Measure	Sum	SD	Range	Alpha
FFMQ (total)	120.10	18.52	103.0	0.89
Observing	26.17	5.83	32.0	0.81
Describing	26.09	6.73	32.0	0.90
Acting with awareness	23.73	6.26	31.0	0.89
Non-judging	24.65	7.38	32.0	0.92
Non-reactivity	19.46	4.84	28.0	0.84
AES (total)	43.05	11.57	60.0	0.90
Chills	11.05	4.31	18.0	0.89
Touched	8.01	2.77	12.0	0.67
Absorbed	23.97	6.32	30.0	0.83
Aesthetic Fluency	14.14	8.81	40.0	0.88

The AES can be divided into three subscales (Chills, Touched and Absorption), therefore an additional multivariate linear regression analysis (Model 3) was conducted to explore the extent to which these three variables were predicted by the FFMQ subscales, Aesthetic Fluency and

Sex. To compensate for three outcome variables a Bonferroni correction was employed, providing a more stringent alpha criterion ($\alpha = .017$). The analysis indicated that the model significantly predicted all three subscales accounting for 10.4% (calculated using r Square Adjusted) of the variance in Chills, ($F(7, 199) = 4.406$, $MSE = 16.7$, $p < .001$, $\eta^2 = .134$), 15.4% of the variance of Touched ($F(7, 199) = 6.338$, $MSE = 6.5$, $p < .001$, $\eta^2 = .182$) and 26.4% of the variance of Absorption, ($F(7, 199) = 10.207$, $MSE = 30.4$, $p < .001$, $\eta^2 = .241$). Table 5 displays a summary of the model and shows that Observing and Non-judging significantly predicted Chills; Non-judging and Sex were significant predictors of Touched; and Acting with awareness, Non-judging and Aesthetic Fluency all predicted Absorption.

Table 3 Inter-factor correlations for the FFMQ and AES

Inter-factor Correlations for the FFMQ					Inter-factor Correlations for the AES		
Factor	Describing	Acting	Non-judge	Non-react	Factor	Touched	Absorbed
Observing	.310**	-.176*	-.131	.252*	Chills	.578**	.605**
Describing		.278**	.354**	.310**	Touched		.591**
Acting			.390**	.138*			
Non-judge				.127			

* $p < .05$ ** $p < .01$

Table 4 Regression for overall Aesthetic Experience

Model	Predictor	β	t	p	95% CI	Tolerance	VIF
1	(Constant)	18.82	4.192	.001			
	Observing	0.596	4.454	.001	.33, .86	.92	1.09
	Aesthetic Fluency	2.166	2.473	.014	.44, 3.89	.94	1.07
	Sex	1.909	1.067	.287	-1.62, 5.44	.97	1.03
2	(Constant)	27.53	4.317	.001			
	Observing	.363	2.512	.013	.08, .65	.71	1.40
	Describing	.087	.674	.501	-.17, .34	.67	1.49
	Acting	-.232	-1.793	.075	-.49, .02	.78	1.29
	Non-judging	-.395	-3.522	.001	-.62, -.17	.74	1.35
	Non-reactivity	.340	2.109	.036	.02, .66	.83	1.21
	Aesthetic Fluency	2.645	3.126	.002	.98, 4.31	.91	1.10
	Sex	2.210	1.262	.208	-1.24, 5.66	.93	1.08

β = unstandardised beta values; 95% CI = 95% confidence intervals for unstandardised beta values

Table 5 Summary of regression analysis for subscales of the Aesthetic Experience Scale (Chills, Touched and Absorption)

Predictor	Chills				Touched				Absorbed			
	β	t	p	95% CI	β	t	p	95% CI	β	t	p	95% CI
(Constant)	7.67	3.237	.001		4.53	3.06	.003		17.36	5.428	.001	
Observing	.140	3.423	.016*	.026, .254	.037	1.019	.309	-.034, .108	.186	2.391	.018	.033, .340
Describing	.016	-.315	.753	-.086, .118	.034	1.043	.298	-.030, .098	.037	.534	.594	-.101, .175
Acting	-.012	-.230	.818	-.114, .090	-.029	-.887	.376	-.092, .035	-.191	-2.742	.007*	-.328, -.054
Nonjudging	-.140	-3.122	.002*	-.228, -.052	-.096	-3.437	.001*	-.151, -.041	-.159	-2.626	.009*	-.278, -.040
Nonreact	.098	1.527	.128	-.029, .226	.063	1.574	.117	-.016, .143	.178	2.049	.042	.007, .350
Aesthetic Fluency	.180	.532	.595	-.487, .847	.494	2.338	.020	.077, .911	1.971	4.319	.001*	1.071, 2.872
Sex	.382	.545	.586	-.998, 1.761	1.279	2.925	.004*	.417, 2.140	.550	0.582	.561	-1.313, 2.412

critical $\alpha = 0.016$; * $p < 0.05$; β = unstandardised beta values; 95% CI = 95% confidence intervals for unstandardised beta values

Discussion

Intense subjective responses to works of art, such as goosebumps, appear to be relatively common, although there are large variations in the frequency with which people experience them (Silvia & Nusbaum, 2011; Sloboda, 1991). Based on theoretical considerations and the findings from a previous study (Diaz, 2013), we investigated whether there was an association between trait mindfulness and frequency of aesthetic states in response to the arts. We report the novel finding that, in accordance with our prediction, the Observing facet of mindfulness positively predicted the frequency of occurrence of aesthetic states, while controlling for aesthetic expertise

and sex. In addition, when simultaneously entered in a regression model containing all five FFMQ subscales as individual predictors, together with the control variables (aesthetic fluency and sex), we found that Non-reactivity positively predicted aesthetic responses, and Non-judging negatively predicted aesthetic responses. In line with previous studies we found an expertise effect, where participants who were more knowledgeable about the arts in general reported more aesthetic experiences (Kozbelt & Seeley, 2007). In addition we found that music was the most frequently reported domain, also in agreement with previous studies (Silvia & Nusbaum, 2011).

Our data indicated that participants with higher trait levels of the Observing subscale of the FFMQ reported more aesthetic experiences in relation to the area of the arts that they encountered most frequently in their everyday life. This is a novel finding, and we suggest that it is in accordance with several theoretical formulations and with a number of previous empirical studies that have investigated mindfulness and aesthetic experience separately. Observing is widely regarded as a key feature of mindfulness (Bishop et al., 2004; Lilja, Lundh, Josefsson, & Kalkenström, 2012), and experimental evidence suggests that the Observing facet of trait mindfulness appears to be related in particular to perceptual awareness (Anicha et al., 2012).

The importance of perceptual awareness and perceptual processing of an art object is emphasized in several information-processing models of aesthetic experience (Chatterjee, 2011; Leder et al., 2004; Marković, 2012; Nadal, Munar, Capo, Rossello, & Cela-Conde, 2008). This is especially emphasized in the model of Leder et al. (2004), where perceptual analyses of features (such as symmetry, contrast, colour, and visual complexity) forms the first of five stages in the process of aesthetic experience. It should be noted that Leder et al.'s (2004) model can also be applied to art domains that rely on perception in other sensory modalities, such as music. Cupchik and Winston's (1996) account of aesthetic experience specifies that the generation of aesthetic experience requires top-down control to (re)direct attention towards the sensory

properties of the artwork, and executive control of attention has been found to be increased in participants with mindfulness training (Tang et al., 2015). Moreover, increased attention and awareness may also foster a more open and objective experience of external stimuli by reducing the influence of top-down biases (for example, desires, expectations, etc.) on perception (Adair & Fredrickson, 2015). Diminished top-down biases in perception could, in the current context, lead to enhanced perceptual engagement with the artwork, fueling a more complete aesthetic experience.

Based on the above observations and our own data, we may tentatively suggest that participants who have higher levels of the Observing facet of mindfulness (i.e., are better able to regulate their own attentional processes, and potentially have reduced biases in perceptual processing), can conduct a more thorough perceptual analysis of the artwork (whether it is a film, music, or visual art etc.), in turn leading to more frequent and intense aesthetic responses to the artistic stimulus. Of course we acknowledge that there may be other explanations for the data, and thus we strongly encourage future research to shed further light on these initial findings.

In our study Non-reactivity also emerged as a unique predictor of the frequency of aesthetic experience, when entered in a regression model (Model 2) containing all five FFMQ subscales together with the control variables (aesthetic fluency and sex). Non-reactivity is characterized by an acceptance of ongoing experiences, without grasping or pushing them away (Baer et al., 2004; Baer et al., 2006). Previous research has suggested that Non-reactivity is associated with enhanced positive emotional responses (Catalino & Frederickson, 2011), particularly in relation to pleasant events, therefore participants who scored high in Non-reactivity may have experienced heightened levels of positive affect in response to artistic cues. Further research is needed to elucidate this association and investigate the precise mechanisms that contributed to the relationship.

It seemed somewhat surprising that, in Model 2, the trait of Non-judging negatively predicted the frequency of aesthetic experiences, i.e., participants who scored higher on the Non-judging subscale reported fewer aesthetic experiences. In our study, Non-judging (accepting thoughts and feelings without evaluating them) was negatively associated with all three aesthetic experience subscales. Here we propose that this result is in line with a number of models of aesthetic experience that highlight the key role of appraisal and evaluation in the generation of the aesthetic response (Brattico, Bogert, & Jacobsen, 2013; Chatterjee, 2011; Leder et al., 2004; Nadal et al., 2008). For example, in Leder et al.'s (2004) model, an explicit judgement of the artwork forms one of the end-points, or outputs, of the stages of aesthetic processing, while Nadal et al.'s (2008) model incorporates a decision-making component in which various aspects (for example, symmetry, beauty, etc.) of the artwork are explicitly judged. Therefore a plausible explanation for our finding is that participants who exhibit a tendency towards non-judgement of their experience may be less inclined to form an evaluative judgment of the artwork, thereby failing to complete the aesthetic process.

Acting with awareness did not predict overall frequency of aesthetic responses (Model 2), but was negatively associated with the Absorption subscale of the AES (Model 3). Acting with awareness gauges the tendency to attend to activities that one is performing, as opposed to acting on autopilot. Our finding that participants who scored higher on Acting with awareness reported less sense of absorption in an artworks makes sense conceptually, as presumably it would be hard to both be aware of one's own bodily actions, and at the same time be fully immersed in the virtual world of a painting or piece of music. Indeed, one of the items in the Absorption subscale is "feel like you are somewhere else", which is presumably experientially opposite to the state of being aware of one's moment-to-moment bodily actions and movements.

The current study is an initial exploration of the association between mindfulness and aesthetic experience using an online study, and is limited by the cross-sectional, correlational design, where the causal nature of the association cannot be determined. For instance, while the results suggest that the Observing facet of mindfulness is associated with frequency of aesthetic experience, it could also be the case that having more frequent aesthetic experiences results in higher levels of the Observing facet of mindfulness. Another limitation is that the sample included only meditation-naïve participants, which precludes generalization of the results to trained meditators. In addition, the current study used online self-report measures, which may contain reporting and recall errors. To attempt to minimize these potential problems, future studies should measure aesthetic responses during or immediately following exposure to an artistic stimulus. Additionally, participants' aesthetic reactions could be measured not only by self-report, but also by psychophysiological measures (for example, galvanic skin response or heart rate) to assess physiological arousal (see e.g., Grewe, Kopiez, & Altenmüller, 2009). Future research could use experimental methods such as short-term mindfulness induction procedures or longer-term interventions, to further elucidate the findings and establish a causal link between mindfulness and aesthetic experience.

Compliance with Ethical Standards

Ethical approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional ethics committee and with the 1964 Helsinki declaration and its later amendments.

Informed consent: Informed consent was obtained from all individual participants included in the study.

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