



The influence of the physical context and knowledge of artworks on the aesthetic experience of interactive installations

Magdalena Szubielska¹ · Kamil Imbir² · Anna Szymańska¹

Published online: 15 June 2019

© The Author(s) 2019

Abstract

In the current study, the influence of the physical context and the knowledge of artworks on the aesthetic experience of installation art is tested for the first time. We assessed non-experts in the field of art ($N = 158$) who viewed interactive installations in either the art gallery context or the classroom. Some participants knew both the artworks' titles and the curator descriptions, some knew only the titles, and some had no contextual information. We tested both the aesthetic emotions and the aesthetic judgments. For the measurement of aesthetic emotions, we used the Self-Assessment Manikin approach including the traditional dimensions of affect and the measurement of recently-proposed dimensions such as origin or subjective significance. The study replicated previous findings that the gallery context enhances the aesthetic experience – both of art appreciation and aesthetic emotions. Moreover, our results showed that the emotions caused by viewing the installation in the gallery had more of an automatic source (metaphorically coming “from the heart”) and were more subjectively significant than aesthetic emotions experienced in the classroom context. Curatorial information increased the understanding and appreciation of the works of installation art, and also caused the aesthetic emotion to be more positive and more intensive; while having knowledge about the titles did not influence the aesthetic experience.

Keywords Gallery context · Artwork title · Artwork description · Aesthetic emotion · Aesthetic judgment · Installation art

Introduction

The interactivity of museums usually refers to interface design, particularly in art and science exhibitions or children's museums. Interactivity understood in this way appears to increase the audience's involvement in learning about museum exhibits and plays an educational role. Most often, interactive objects refer only to museum exhibits, while the interaction of spectators with the exhibits themselves is not permitted. On the one hand, the interactive art exhibitions in which visitors can touch works of art are rare (perhaps because the curators do not want the exhibition spaces to be associated with a playground, or perhaps because the artworks could be damaged) (Barry 2014).

On the other hand, many contemporary artistic practices require the active participation of the spectator. This is the case for performances, conceptual artworks and installations (Dezeuze 2010). One of the critical features of installation art is that it is interactive – but not necessarily in the sense that the viewer can touch a work of art. It may well be the interactivity resulting from the fact that viewers dwelling or moving around in the area of the installation becomes part of the artwork (Pelowski et al. 2018a).

Although installations are one of the most important phenomena in contemporary art, they have rarely been the object of the interest of empirical aesthetics. Kapoula et al. (2011), which focused on the movements of viewers' bodies in relation to the components of Richard Serra's monumental installation *Promenade* (2008), noted this inadequate level of attention. Tröndle et al. (2014) analysed the aesthetic experience evoked by the artistic interventions of *A Label Level* (2009), created by Nedko Solakov, in St. Gallen Fine Arts Museum in Switzerland. The researchers were interested in what audience and work of art characteristics cause the artist's creations to be interpreted by the audience as art. In the exploratory study, in which the issue of the aesthetic response to installation art was addressed, an integrative approach was adopted (Pelowski

✉ Magdalena Szubielska
magdasz@kul.lublin.pl

¹ Institute of Psychology, The John Paul II Catholic University of Lublin, Aleje Racławickie 14, 20-950 Lublin, Poland

² Faculty of Psychology, University of Warsaw, Stawki 5/7, 00-183 Warszawa, Poland

et al. 2018a). Researchers invited participants to the *Baroque, Baroque* (2015–2016) exhibition by Olafur Eliasson and tested spectators' emotions and visual attention, artwork appraisals and interpretations of two installations. Pelowski et al.'s latest study on installation art was focused on emotion sharing and understanding between working artists and perceivers of their installations (Pelowski et al. 2018b). All four studies of installation art reception presented here were conducted in exhibition spaces, and their authors do not indicate whether the titles, curatorial descriptions or other information about the artworks were available to viewers.

Both the physical context and the knowledge of works of art affect the aesthetic experience of the recipients (see Pelowski et al. 2017a for a review). Individuals who viewed the paintings in the context of a gallery appreciated them more than the viewers who were shown reproductions of paintings, art photographs and collages outside the gallery (Brieber et al. 2015b; Brieber et al. 2014; Locher and Dolese 2004; Locher et al. 1999, 2001; Specker et al. 2017). When separately manipulating physical contexts (museum vs laboratory) and genuineness (genuine vs reproduction), the museum enhancement effect was not revealed when assessing conceptual artworks related to the medium of photography (Brieber et al. 2015a), but was shown in the case of canvas paintings (Grüner et al. 2019): figurative and abstract painted art was liked more and rated as more interesting in the museum than in the laboratory. It is likely that Brieber and colleagues (Brieber et al. 2015a) did not reveal the effect of the physical context because of the use of photography – an art medium that may not benefit from an “in person” viewing context. Therefore, the argument can be made that tangible formal aspects must be seen “in person” so that the gallery's context can be revealed (cf. Brieber et al. 2015a vs Grüner et al. 2019). Viewers are likely especially focused on these aspects during the reception of the art of installation due to its interactive nature (cf. Pelowski et al. 2018a). That is why in the current study, we consider the gallery context effect toward the installation art.

Having knowledge of works of art, resulting from the knowledge of their title or description, positively affects aesthetic experience (Belke et al. 2010; Cupchik et al. 1994; Gerger and Leder 2015; Jucker et al. 2014; Leder et al. 2006; Millis 2001; Russell 2003; Russell and Milne 1997; Specht 2010; Swami 2013). If art is viewed in conditions in which the recipients have the opportunity (i.e. enough time) to analyze the piece of art, elaborative contextual information semantically corresponding to the artwork increases viewers' ratings of comprehension and/or appreciation (cf. Belke et al. 2010; Cupchik et al. 1994; Gerger and Leder 2015; Jucker et al. 2014; Leder et al. 2006; Mullennix et al. 2018; Swami 2013). Even in viewers aged 4 to 5, the positive effects of a curatorial guiding tour on the liking of contemporary art were found (Szubielska et al. 2018b). Contextual information about a piece of art increase individuals' evaluation of

contemporary art, especially when individuals simultaneously view the artwork and listen to contextual information about it (Szubielska et al. 2018a).

According to our knowledge, the influence of the physical context and the knowledge of works of art on the aesthetic experience of installation art has not been tested so far. Researching the reception of installations in exhibition spaces ensures their external validity (cf. Tschacher et al. 2012) because the natural context for the reception of art is a museum or gallery (cf. Pelowski et al. 2017a). This appears to be particularly true in the case of installation art, which is often site-specific and requires viewer interaction (cf. Pelowski et al. 2018a). The context of a gallery allows visitors to fully experience the work of art, which is available not only for visual modality but is often experienced physically through almost all senses. Although viewing art in a gallery seems to be the most typical method of experiencing art, it is not the only one. For various reasons, we do not always have the opportunity to reach the exhibition we are interested in – consequently, we may view photos and films posted by galleries on their websites. Therefore, it would be worth testing how the installation affects the emotions and aesthetic judgments of the recipients when viewed as an original in the gallery and how this compares to experiencing it outside the gallery in a digitised form. Installations, as an example of conceptual art, might be challenging for a viewer who is not an expert in the field of art (cf. Pelowski et al. 2018a). Hence the answer to the question of what kind of contextual information helps non-experts to understand and appreciate the art of installations is essential. Is it enough for viewers to get acquainted with the titles of the installation? Alternatively, they will perhaps need more clues – in the form of descriptions of works (e.g. prepared by curators) to understand the artist's idea and react in a more positive way to a work of art?

In the current study, we tested the influence of the physical context and contextual information about works on the aesthetic experience of installation art, and differentiated between aesthetic emotion and aesthetic judgments (cf. Leder et al. 2004). There are two distinct approaches to assessing emotions. One is based on the adjectives scales, similar to those used for measuring mood (Watson et al. 1988). The main drawback for this approach is to answer the question expressed by the word; one has to activate the verbal representation of emotion. Such processes influence the emotions experienced, silencing them. Therefore the measurement may be biased by the method itself (Herbette and Rimé 2004). The second approach, developed to eliminate the need for the verbalization of emotion, was postulated by Lang (1980) with the introduction of Self-Assessment Manikin (SAM) scales. The SAM is a schematic representation of a human figure, showing the symptoms of emotional reactions (Imbir 2016a) that progress gradually from one figure to another. The original SAM scales were designed to represent the three factors

identified in differential semantic studies (Osgood et al. 1957), which describe the variability of emotional assessments of stimuli: valence/pleasantness, arousal/energy and dominance/control (Moors et al. 2013). The idea of SAMs is simple; a participant has to choose the state most resembling their current feeling. Due to the pictorial nature of SAMs, no verbalization is required, therefore the assessment of emotional states should not interfere with individuals' experiences of the emotion. Recently, the SAM scales for additional factors derived from the dual-processes theory of emotion formation were proposed (Imbir 2016b; Jarymowicz and Imbir 2015), namely, origin and subjective significance. The origin of an affective reaction to stimuli facilitates the measurement of the automatic (metaphorically described as “from the heart” in the measurement method, cf. SAM scale for origin) vs reflective (metaphorically described as “from the mind”) mechanisms responsible for emotion. The subjective significance of affective reactions is supposed to be a reflective form of activation (similar to arousal) but based on a conscious attitude towards the importance of the situation, stimulating one's willingness to engage in the demanding processing required by the reflective mind (Imbir 2016b). The SAM scales appear to be a reliable method for the assessment of emotional reactions to different aesthetic stimuli, including musical excerpts of pieces from different genres (Imbir and Gołab 2017). So far, however, the assessment of visual arts using SAM scales extended by the dimensions of origin (automatic vs reflective, cf. Jarymowicz and Imbir 2015) and their respective significance has not been studied.

Based on earlier studies on contemporary art reception, we hypothesized the positive effects of both the gallery context (compared with the classroom context) and listening to contextual information about a piece of art on the aesthetic experience of installation art by non-expert adults in the field of visual arts. With reference to the enhancement of aesthetic judgments, we predicted that (H1) individuals who view installations in the gallery context appreciate an exhibition more than individuals who view installations in a classroom (cf. Brieber et al. 2015b; Grüner et al. 2019). We also predicted that viewers who have more contextual information about installations (no information vs. original title only vs. original title and curatorial description containing interpretation)¹ (H2) rate them as more understandable (cf. Jucker et al. 2014; Leder et al. 2006; Millis 2001; Russell 2003; Russell and Milne 1997; Swami 2013) and (H3) appreciate them more (cf. Belke et al. 2010; Cupchik et al. 1994; Jucker et al. 2014; Millis 2001; Swami 2013). Additionally, we formulated two hypotheses concerning aesthetic emotions. We expected that

observers in the gallery context (compared with the classroom context) would assess the affective experiences induced by contact with installation art: (H4) as originating naturally (metaphorically coming more “from the heart”) – as in the case of installations, artworks can be physically experienced – therefore viewers in the gallery context may be focused on their natural bodily sensations (cf. Pelowski et al. 2018a); and (H5) as more subjectively significant – because original artworks exhibited in an art gallery have a special aura (cf. Hayn-Leichsenring 2017). Finally, we also questioned whether contextual knowledge changes the emotional experience of the viewers of installation art, but this was treated as an exploratory question.

Method

Participants

The study involved 158 participants (34 males) between 19 and 31 years of age ($M_{\text{age}} = 21.47$, $SD = 1.78$); initially, the total sample size was $N = 161$, but three individuals resigned during the study and failed to provide any answers. Participants were studying for a master's of psychology degree. They did not have any formal or informal training in creating art or art history. None of the participants had previously seen the interactive exhibition in Galeria Labirynt. The sample was divided into five experimental groups: (1) – those who viewed the exhibition in the gallery and knew the titles of the artworks ($N = 26$); (2) – those who viewed the exhibition in the gallery and knew both the titles and curatorial descriptions of artworks ($N = 24$); (3) – those who viewed the video documentation of the exhibition outside of the gallery without knowing the titles nor descriptions ($N = 33$); (4) – those who viewed the video documentation of the exhibition outside of the gallery and knew the titles ($N = 36$); (5) – those who viewed the video documentation of the exhibition outside of the gallery and knew both the titles and the descriptions ($N = 39$).

Materials

The materials used in the experiments were the installation artworks – together with their titles and curator's description – making up the *Art Ingredients* exhibition, shown at the Galeria Labirynt gallery in Lublin from 26 May 2018 until 15 July 2018.

The exhibition consisted of eleven interactive artworks which may be considered installations. Their authors were mostly young, relatively unknown artists (see Appendix). The curators (Anna Szary and Agata Sztorc) assumed that all exposed works would not only be touched by viewers but also transformed by the audience to a lesser or greater extent.

¹ Because the study was conducted in a gallery under natural circumstances, i.e., with the titles of installations accessible to all viewers on the exhibition space walls (because it might consider the fact that the title of the artwork is part of the artwork), there was no condition of lack of information about the artworks in the gallery context condition.

The curatorial team chose works that could be safely transformed analogously (possible interactions with the artworks are described in [Appendix](#)). All artworks were presented in one exhibition room (23 m width × 17.4 m long × 7.6 m high in the highest place). The exhibition layout was designed by the curators in conjunction with the artists.

The descriptions were the original text provided by the gallery (see [Appendix](#)). No specialized vocabulary was used in this information, and it took approximately 20–30 s to read each description out loud.

For the dependent value measurement of emotional reactions to art, the SAM scales were used, alongside the Polish descriptions proposed by Imbir (2016a). Each SAM scale consisted of 5 different humanoid figures expressing different emotional states. Participants had to rate their emotional state while viewing the artworks with the use of a 9-point Likert scale, depicting certain states illustrated on the SAM figures or states located somewhere between figures.

Procedure

The research was group-based (in each group there were between 9 to 16 individuals) and was carried out in the gallery or outside of it. Participants were familiarized with the descriptions of the SAM scales used for assessing emotional reactions to artworks. Subsequently, all respondents were informed that it was an interactive exhibition and they were permitted to touch the installations and interact with the works of art.² Participants viewed 11 works of art in a fixed order (see [Appendix](#)). After viewing each piece, they assessed their affective experience evoked by a particular installation on five 9-point Likert SAM scales in a fixed order: valence/pleasantness (negative vs. positive), activity/arousal (low vs. high), power/dominance (low vs. high), origin (automatic vs. reflective) and subjective significance (low vs. high) (see Imbir 2016a). After viewing all of the artworks, participants rated the exhibition overall (staying in the exhibition room – in a gallery condition or from memory – in a classroom condition) on five 7-point scales (in a fixed order) referring to aesthetic judgments. The endings of the scales were described as follows: “ugly – beautiful”, “repulsive – fascinating”, “incomprehensible – understandable”, “kitsch – masterpiece” and “I definitely don’t like it – I definitely like it”. Finally, the respondents assessed their knowledge of art and interest in contemporary art on a 7-point scale (the exact wordings were: “I have a lot of knowledge about art” and “I am interested in contemporary art”; the endings of the scales were “definitely disagree” and “definitely agree”). All responses were given on paper. The entire study lasted for roughly 45 min.

² This information was also given in the control group, who did not know the titles or descriptions of the works – so that the subjects would not be surprised if the experimenter touched and interacted with artworks.

Participants who viewed the exhibition in the gallery context (randomly assigned to two experimental conditions to participants who signed up for the study at a precise date and time: knowing titles and knowing both titles and descriptions) were organized into groups at the entrance of the exhibition hall. They were told the exhibition title, and they were invited to view the exhibition piece by piece. Participants were given an unlimited amount of time in which to view each work of art. However, all respondents in a group had to evaluate their current work of art before proceeding to the next installation. Viewing each installation began with introducing its title or both its title and its description (the conductor of the experiment read the curator’s information), followed by the conductor’s demonstration of how one may interact with that particular work of art. Viewers could then touch and interact with the works if they felt like it.

Participants who viewed the exhibition outside of a gallery were tested in the university’s classrooms. They were randomly assigned three conditions based on the information they would receive about the artworks: both titles and descriptions; only titles; neither titles nor descriptions. In the first two conditions, the participants were also given the title of the exhibition, while in the third condition the title of the exhibition was unknown to respondents. Each installation was presented in the form of video material using a multimedia projector. All participants were explicitly told that the videos of a person manipulating the artworks were showing a work of art (as it could influence the aesthetic appraisals – cf. Pelowski et al. 2017b). The short video (lasting about 20–30 s) showed one of the experiment’s conductors interacting with a work of art in an exemplary way. In conditions where participants knew the titles of the exhibitions, the viewing of each video was preceded by reading the title of the artwork in question on behalf of the experiment’s conductor. In cases where the participants knew the descriptions, the conductor of the experiment read the curatorial information during each recording.

Results

Analyses were performed using IBM SPSS 25.0. In the first step, we compared the knowledge of art and interest in contemporary art declared in each group of participants. Neither knowledge, $F(4,153) = 1.20, p = .313$ nor interest, $F(4,153) = 1.40, p = .235$ was significantly different between the groups of viewers. Participants generally declared a moderate knowledge of art and interest in contemporary art (respectively $M = 3.29, SD = 1.42$ and $M = 3.12, SD = 1.54$ on a scale with a maximum score of 7). In the second step, we analyzed Pearson’s correlation coefficients between five dimensions of aesthetic judgments (see [Table 1](#)). As all correlations between the dimensions of aesthetic judgments – beauty, fascination, mastery, and liking – were positive and had at least

Table 1 Pairwise correlations between all dimensions of aesthetic judgments

	Fascination	Understanding	Mastery	Liking
Beauty	.573*	.425*	.552*	.710*
Fascination		.465*	.677*	.722*
Understanding			.361*	.488*
Mastery				.631*

* = $p < .001$

moderate strength, we decided to build a composite score of aesthetic preference by averaging these four scales.

Descriptive statistics on the dependent variables concerning aesthetic emotions (i.e., valence, arousal, dominance, origin, and subjective significance) and aesthetic judgments (i.e., understanding and preference) are presented in Table 2.

To examine the impact of physical context and knowledge about artworks on viewers' affective experience and aesthetic judgments, we computed a multivariate analyses of variance (MANOVAs) with physical context (2: gallery, classroom) and knowledge about the artworks (2: title, title and description) as between-participant factors and dependent variables concerning aesthetic emotions (5: valence, arousal, dominance, origin, subjective significance) and aesthetic judgments (2: understanding, preference), respectively. The level of significance was defined at 0.05. We calculated analyses of variance (ANOVAs) following significant MANOVAs (cf. Bock 1975). To examine the impact of knowledge of artworks on viewers' affective experience and aesthetic judgments, and taking into account the control situation when participants knew neither the title of the exhibition nor the titles of the artworks, we analysed only the data coming from participants who viewed the videotaped installations in a classroom context by computing MANOVAs with knowledge about

artworks (3: control condition, title, title and description) as the between-participant factors and dependent variables concerning aesthetic emotions (5) and aesthetic judgments (2), respectively. Again, we then calculated ANOVAs that followed significant MANOVAs' effects. Moreover, significant effects in ANOVAs were followed up by post hoc comparisons using Bonferroni adjustments.

Aesthetic Emotional Experience

The MANOVAs with physical context (2) and knowledge of artworks (2) as between-participant factors and the five SAM scales as the dependent variables yielded significant main effects of the physical context, Wilks' $\Lambda = .70$, $F(5, 117) = 10.06$, $p < .001$, $\eta_p^2 = .30$, and knowledge about artworks, Wilks' $\Lambda = .84$, $F(5, 117) = 4.52$, $p = .001$, $\eta_p^2 = .16$. The interaction between the effect of the physical context and knowledge about artworks was not significant, Wilks' $\Lambda = .98$, $F(5, 117) = .45$, $p = .814$.

The physical context had a considerable effect on affective ratings, expressed using four scales: valence, arousal, origin, and subjective significance (see Table 3). Participants who viewed the works of art in a gallery, in comparison to the digital viewers, who viewed the installations in a classroom, felt more positive emotions ($M_{\text{gallery}} = 6.43$, $SD = .81$ vs. $M_{\text{classroom}} = 5.62$, $SD = .95$), were more aroused ($M_{\text{gallery}} = 5.60$, $SD = .84$ vs. $M_{\text{classroom}} = 4.64$, $SD = 1.19$), had the source of their emotions in the automatic to a greater extent than in the reflective origins (origin: $M_{\text{gallery}} = 4.60$, $SD = .85$ vs. $M_{\text{classroom}} = 5.14$, $SD = 1.08$), and deemed their aesthetic emotions as more important ($M_{\text{gallery}} = 4.94$, $SD = 1.10$ vs. $M_{\text{classroom}} = 4.39$, $SD = 1.34$).

Knowledge about the artworks had a significant influence on the following aspects of affective response: valence, dominance, and subjective significance (see Table 3). Participants

Table 2 Means of aesthetic emotion on the following dimensions: valence, arousal, dominance, origin, subjective significance, and aesthetic judgments: understanding and preference in each group. standard deviations are presented in parentheses

	Gallery context		Classroom context		
	T	T&D	NoT&D	T	T&D
Aesthetic emotions					
Valence	6.12 (.82)	6.76 (.65)	5.24 (.90)	5.28 (.85)	5.94 (.93)
Arousal	5.59 (.72)	5.62 (.97)	4.80 (1.33)	4.39 (1.25)	4.88 (1.09)
Dominance	5.45 (1.31)	6.03 (1.15)	5.41 (1.33)	5.72 (1.27)	6.24 (1.05)
Origin	4.55 (.90)	4.66 (.80)	5.06 (1.45)	5.27 (1.26)	5.02 (.89)
Significance	4.73 (1.26)	5.17 (.86)	4.36 (1.41)	4.05 (1.41)	4.71 (1.21)
Aesthetic judgments					
Understanding	4.04 (1.28)	5.13 (1.45)	3.45 (1.56)	3.75 (1.34)	4.77 (1.22)
Preference	4.76 (1.18)	5.48 (.98)	3.84 (1.03)	3.99 (.89)	4.56 (.91)

T = knowledge of titles; T&D = knowledge of titles and descriptions; NoT&D = no knowledge of titles or descriptions (control condition)

Table 3 Effects of physical context and knowledge about artworks on aesthetic emotions and aesthetic judgments: inferential statistics of follow-up tests for MANOVAs

	Physical context (2)	Knowledge about artworks (2)	Knowledge about artworks (3)
Aesthetic emotions			
Valence	$F(1, 121) = 29.64, p < .001, \eta_p^2 = .20$	$F(1, 121) = 18.36, p < .001, \eta_p^2 = .13$	$F(2, 105) = 7.31, p = .001, \eta_p^2 = .12$
Arousal	$F(1, 121) = 25.32, p < .001, \eta_p^2 = .17$	$F(1, 121) = 1.86, p = .175, \eta_p^2 = .02$	$F(2, 105) = 1.72, p = .185, \eta_p^2 = .03$
Dominance	$F(1, 121) = 1.20, p = .276, \eta_p^2 = .01$	$F(1, 121) = 6.27, p = .014, \eta_p^2 = .05$	$F(2, 105) = 4.28, p = .016, \eta_p^2 = .08$
Origin	$F(1, 121) = 8.66, p = .004, \eta_p^2 = .07$	$F(1, 121) = .15, p = .704, \eta_p^2 = .001$	$F(2, 105) = .45, p = .640, \eta_p^2 = .01$
Significance	$F(1, 121) = 6.42, p = .013, \eta_p^2 = .05$	$F(1, 121) = 6.00, p = .016, \eta_p^2 = .05$	$F(2, 105) = 2.26, p = .109, \eta_p^2 = .04$
Aesthetic judgments			
Understanding	$F(1, 121) = 1.80, p = .183, \eta_p^2 = .02$	$F(1, 121) = 19.20, p < .001, \eta_p^2 = .14$	$F(2, 105) = 9.30, p < .001, \eta_p^2 = .15$
Preference	$F(1, 121) = 22.42, p < .001, \eta_p^2 = .16$	$F(1, 121) = 13.01, p < .001, \eta_p^2 = .10$	$F(2, 105) = 5.98, p = .003, \eta_p^2 = .10$

who were acquainted with the titles and curatorial descriptions of the works, in comparison to the viewers who knew only the titles, felt more positive emotions ($M_{\text{titles \& descriptions}} = 6.25, SD = .92$ vs. $M_{\text{titles}} = 5.63, SD = .93$), a higher degree of control ($M_{\text{titles \& descriptions}} = 6.16, SD = 1.09$ vs. $M_{\text{titles}} = 5.61, SD = 1.28$), and considered their experiences to be more significant ($M_{\text{titles \& descriptions}} = 4.88, SD = 1.11$ vs. $M_{\text{titles}} = 4.33, SD = 1.38$).

The MANOVA using knowledge about artworks (3) as between-participant factors and the five SAM scales scores as the dependent variables revealed the significant main effect of artwork knowledge, Wilks' $\Lambda = .82, F(10, 202) = 2.05, p = .030, \eta_p^2 = .09$.

Knowledge of artworks significantly influenced two dimensions of an affective response: valence and dominance (see Table 3). Participants who knew both the titles and descriptions felt significantly more pleasure than viewers who knew only the titles ($p = .005$) and respondents from a control group ($p = .004$). Participants who knew the titles and descriptions felt significantly more dominant than control group participants ($p = .015$) (see Table 2). The remaining pairwise comparisons were not statistically significant (all $ps > .108$).

Aesthetic Judgments

The MANOVA with physical context (2) and knowledge about artworks (2) as between-participant factors and the two dimensions of aesthetic judgments (understanding and preference) as the dependent variables were computed. The analysis showed significant main effects of physical context, Wilks' $\Lambda = .84, F(2, 120) = 11.32, p < .001, \eta_p^2 = .16$, knowledge about artworks, Wilks' $\Lambda = .84, F(2, 120) = 11.51, p < .001, \eta_p^2 = .16$, and no significant interaction between factors, Wilks' $\Lambda = 1.00, F(2, 120) = .09, p = .918$.

Physical context had a considerable effect on aesthetic preference (see Table 3). The viewers who saw the installations in the gallery, compared to the viewers who saw the artworks in

the classroom, preferred the exhibition more ($M_{\text{gallery}} = 5.11, SD = 1.14$ vs. $M_{\text{classroom}} = 4.28, SD = .94$).

Knowledge about artworks significantly influenced understanding and preference (see Table 3). Participants who knew the titles and descriptions of the installations, compared to the participants who saw the artworks after getting to know their titles, rated the exhibition as more understandable ($M_{\text{titles \& descriptions}} = 4.90, SD = 1.32$ vs. $M_{\text{titles}} = 3.87, SD = 1.31$) and preferred it ($M_{\text{titles \& descriptions}} = 4.91, SD = 1.03$ vs. $M_{\text{titles}} = 4.31, SD = 1.08$).

The MANOVA with knowledge about artworks (3) as the between-participant factors and the aesthetic judgments scores (understanding preference) as the dependent variables revealed the significant main effect of knowledge about the artworks, Wilks' $\Lambda = .83, F(4, 208) = 5.15, p = .001, \eta_p^2 = .09$.

Knowledge about the artworks significantly influenced understanding and preference (see Table 3). Respondents who knew the titles and descriptions of a work of art rated the exhibition as more understandable than participants who knew the titles only ($p = .005$) and participants who saw the exhibition in a control condition ($p < .001$). Similar results were obtained in relation to the preferences of the exhibition – participants who knew the titles and descriptions of a work of art preferred the exhibition more than participants who knew the titles only ($p = .030$) and those who saw the exhibition in a control condition ($p = .005$) (see Table 2). Other pairwise comparisons were not statistically significant (all $ps = 1.00$).

Discussion

The study aimed to investigate the impact of the physical context of the reception and knowledge of works of art, derived from the original titles and curatorial descriptions, on the aesthetic experience (understood as aesthetic emotions and aesthetic judgments) of installation art. Installations were viewed in the contemporary art gallery or in the classroom.

The viewers were acquainted with the titles of the artworks and the curator's descriptions, only the titles, or they were not given any of this information. In general, we predicted the positive effects of gallery context and knowledge about artworks on the viewers' experiences. We delineated five research hypotheses and one exploratory question.

The Physical Context and Appreciation of the Exhibition

Hypothesis 1 is supported, according to which installation art is appreciated more when perceived in a gallery compared to a classroom. Participants who viewed installations in the gallery, compared to the viewers in the classroom context, preferred the exhibition more (aesthetic preferences were a composite score of the dimensions of beauty, fascination, mastery, and liking). This result extends the effect, according to which artworks' appreciation is enhanced in a gallery (or museum) context (Brieber et al. 2014, 2015b; Grüner et al. 2019; Locher and Dolese 2004; Locher et al. 1999, 2001; Specker et al. 2017). However, in our study genuine installations were shown in the gallery, while in the classroom participants viewed videos presenting installation artworks. This way of examining the effect of the physical context of the art reception on aesthetic experiences became the subject of criticism of researchers who designed an experiment in which they dissociated the physical context and genuineness factors (Brieber et al. 2015a) – and did not show the influence of any of these factors. Interpreting the obtained results, these researchers argue in favour of the possibility of the occurrence of an inverse white cube effect, which they explain as follows: “the artistic nature of works might also enhance the artistic status of the physical context in which they are placed” (Brieber et al. 2015a, p. 103). Nevertheless, in our opinion, it is more likely that Brieber and colleagues (Brieber et al. 2015a) did not show the effect of the physical context because they presented participants photographs – digital reproductions may look similar to photographic prints. Grüner and colleagues (Grüner et al. 2019), who dissociated the physical context and genuineness factors when presenting to participants paintings on canvas, showed enhanced art judgments in the gallery context. Moreover, in most studies with a procedure similar to ours in which an effect of physical context was found, paintings or collages were used (Brieber et al. 2014, 2015b; Locher and Dolese 2004; Locher et al. 1999, 2001; Specker et al. 2017).

Contextual Information and Understanding of the Exhibition

Information about the artworks positively influenced the assessment of exhibition intelligibility, which was in line with Hypothesis 2. At the same time, it turned out that only when

contextual information is provided in the form of the original curatorial description is the understanding of the exhibition increased (the participants who knew the titles and descriptions of the installations, compared to the participants who saw the artworks after getting to know their titles and participants from the control group, rated the exhibition as more understandable) – which confirms earlier studies on the reception of art in which description presenting content-specific information enhanced the understanding of abstract paintings (Russell 2003; Swami 2013). Why does knowing the original title not change the understanding of the work compared to the control situation, in which recipients were not given any information about the artworks? In previous studies in which paintings (Jucker et al. 2014; Leder et al. 2006; Russell and Milne 1997), illustrations, and photographs (Millis 2001) were assessed, semantically matching titles increased artworks' understanding. Perhaps the lack of the effect of the title itself in our study results from the metaphorical nature and ambiguity of the titles of most of the installations presented at the exhibition (cf. Mullennix et al. 2018). In turn, in descriptions the curators usually referred to the title, explaining the author's intention or the context of the uprising of the work of art (cf. Appendix), so both the title and the work of art could become more understandable after hearing such a description. It is also possible that viewers did not pay attention to the titles, as the experience of contemplating art may be more crucial than background information (cf. Pekarik 2004).

Contextual Information and exhibition's Appreciation

Participants who knew the titles and descriptions of the installations preferred the exhibition more than those who knew only the original titles and those who saw the exhibition in a control condition; this is consistent with the results of research on the impact of contextual information on the aesthetic appreciation of paintings (Swami 2013). The obtained results partly confirmed Hypothesis 3 – viewers who have more contextual information about artworks appreciate the exhibition more because the aesthetic appreciation of participants who knew the installations' titles and those who did not know the titles did not differ. The results of previous studies on the impact of the title on aesthetic evaluations are not consistent, likely because different types of titles and different exposure times were used in the study (cf. Belke et al. 2010; Gerger and Leder 2015; Jucker et al. 2014; Leder et al. 2006; Millis 2001; Mullennix et al. 2018). Nevertheless, in some studies, the effect of knowing the semantically matching titles on art appreciation, compared to the control situation in which the titles were not given, was not obtained (cf. Gerger and Leder 2015; Jucker et al. 2014; Leder et al. 2006) – like in current study.

Belke and colleagues (Belke et al. 2010) illustrated that the positive effect of the related titles on aesthetic preference was moderated by the degree of abstraction of artworks – the effect was especially prominent for representational works of art. Therefore, this effect was not revealed for contemporary art installations, which is usually far from representative.

The Physical Context and Origin of Aesthetic Emotions

Hypothesis 4 was confirmed. Observers who experienced the installation in the contemporary art gallery (compared to participants in the classroom) rated their naturally originating aesthetic emotions to a greater extent. Moreover, participants who visited the exhibition in the gallery felt more positive emotions than participants who viewed installations in the classroom. These results may be interpreted in the context of two theories. First is Epstein's (2003) theory of experiential (based on experiencing the present situation as it is) vs rational minds (based on rules of logic and conscious interpretations of present situations in the context of individual knowledge). The second is the dual-processes theory of emotion-cognition interactions (Imbir 2016b) stating that the engagement of natural emotions is typical for experiential mind processing, while reflective emotions are typical for rational mind processing. In the current experiment, aesthetic reactions to art were more naturally originating (from the heart). This gives support to the claims of both theories (Epstein 2003; Imbir 2015). Engagement in experiencing art in a gallery is associated with increased natural aesthetic emotions towards this art. This finding is significant because due to the measurement of origin dimension, we have found a clear difference resulting from the intangible and very subjective factor: the aura of the art gallery. Consequently, we can confirm that experiencing live art evokes different aesthetic emotions.

The Physical Context and Subjective Significance of Aesthetic Emotions

Hypothesis 5 was also confirmed. Participants who experienced the installation in the contemporary art gallery rated their aesthetic emotions as being more subjectively important than participants who experienced the artworks in the classroom. Moreover, viewers were more aroused in the gallery than in the classroom context. Therefore, the aesthetic affective reactions of participants viewing the exhibition in an art gallery were associated with a greater degree of activation, both of arousal (related to the experiential mind) and subjective (related to the rational mind) significance (Epstein 2003; Imbir 2016b). From the theoretical point of view, this is a remarkable result, showing that engagement in the art gallery

experience triggers not only experiential aesthetics (concluded as a result of the confirmation of Hypothesis 4) but also the rational mind interpretations. The special aura accompanying artworks' exposition in the gallery (cf. Hayn-Leichsenring 2017) should be interpreted in terms of feeling the subjective significance of the experience. Although the experiential processes are likely more important in art perception (cf. Imbir 2016b; Jarymowicz and Imbir 2015), one may expect that the specificity of art exhibitions also triggers a reflective aspect of the mind, resulting in the subjective qualities of aesthetical judgments. In the current study, we have provided the measurable operationalization of such sophisticated experiences during perceptions of art that were indeed susceptible to the form of the art presentation.

How Does Contextual Information Knowledge Change the Emotional Experience of Installation Art?

We discovered that the information about a piece of installation art changed the following dimensions of aesthetic emotions: valence – to more positive, dominance – to a higher degree of control, and subjective significance – to more significant (but not if only the groups in the classroom context were analysed – probably due to the results of the control group, which were slightly higher than the results of the group that knew the title and slightly lower than the results of the group that knew both the title and curatorial description – cf. Table 2).

Our results replicate the results of earlier studies showing that content-specific information about artwork positively influenced viewers' emotions (cf. Gerger and Leder 2015; Millis 2001). However, our results showed that only information in the form of a curatorial description changed the emotional experiences of the recipients, and the title itself did not influence aesthetic emotions. The titles also did not affect the assessment of the hedonic value of artworks in earlier studies using a between-participants design (Russell 2003; Russell and Milne 1997) but did affect research using a within-participants design (Russell 2003). The within-participants methodology seems to be more capable of detecting subtle changes in the aesthetic pleasantness, while in our study a between-participants design was used.

Current Study Strengths and Limitations

We are of the opinion that using SAM ratings to measure within the field of empirical aesthetics, including both traditional dimensions of affect, e.g. valence, arousal, and dominance, is a strength (Lang 1980) – which is rare in this field of research (however, Szubielska (2018) used the SAM valence measurement and Szubielska et al. (2018c) used the SAM

valence and arousal measurements in their study on children's reception of contemporary art in a gallery), and the measurement of recently-proposed dimensions of an origin and subjective significance (Imbir 2016b; Jarymowicz and Imbir 2015). So far, this has only been used in assessing emotional reactions to musical (Imbir and Gołąb 2017), but not visual, art aesthetic stimuli. Another strength is that for the first time, we tested how a physical context and knowledge about artworks influence the reception of installation art.

Among the limitations of the current study, we have to discuss several issues. First, the SAM approach to measuring aesthetic emotions is not free from verbalization potentially influencing the emotions themselves. Some verbalization is needed to give the answer and communicate it. We assume that the translation of feeling into the numbered answer occurs after the decision-making stage (a decision is made with the use of a figurative scale). For that reason, this effect should not be substantial and should not disturb the actual feelings. Second, our study has the same limitation as most of the previous research on the effect of the physical context of art on aesthetic experience (Brieber et al. 2014, 2015b; Locher and Dolese 2004; Locher et al. 1999, 2001; Specker et al. 2017); namely, genuine installations were shown in the gallery, while in the classroom, participants viewed videos presenting installation artworks. Third, in the current study a social component was present – viewers might observe other participants in the exhibition (during the visit in the gallery) or the video showing people interacting with the installations (in a classroom context). The time needed to view works of art depends on whether we view them ourselves or in a group of people (Smith and Smith 2001; Smith et al. 2017), although the viewing time is correlated with art appreciation (Brieber et al. 2014). It is possible that we would obtain different results if the participants were viewing installations in a context deprived of other people. Fourth, the control condition (the lack of information about works of art) was introduced only for the classroom context, so we still do not know if knowing just the original titles changes the aesthetic experience of the installation art viewed in the gallery. There are exhibitions in which the titles are not placed on the walls but, for example, on a specially prepared map available in the gallery as supplementary material for the exhibition. In such a situation, it could prove helpful to take a group that does not know the titles or descriptions of the works and test the effect of knowing only the title on the aesthetic experience of the viewers of the art gallery. Fifth, we controlled participants' interests and knowledge about art by measuring them on single scales. Recently, however, a reliable and validated tool for measuring these dimensions has been developed – the Vienna Art Interest and Art Knowledge Questionnaire (Specker et al. 2018).

Conclusions

Our results are consistent with previous studies demonstrating that the physical context of the exhibition space (gallery or museum) intensifies the aesthetic experience of artworks (Brieber et al. 2014, 2015b; Grüner et al. 2019; Locher and Dolese 2004; Locher et al. 1999, 2001; Specker et al. 2017) but also grants new insights into empirical aesthetics – as the influence of physical context had not been tested so far in case of the installation art. Additionally, we have provided a competent new method to use in assessments of aesthetic emotions, namely the SAM scales for the origin and the subjective significance, both of which show susceptibility to the form of art presentation.

The results of our study are in accordance with the fluency-affect-liking hypothesis (cf. Belke et al. 2010; Reber et al. 2004) – as the curatorial information positively influenced both aesthetic emotion and the appreciation of works of art, and with the model of aesthetic appreciation and aesthetic judgments (Leder et al. 2004). This is because in a condition where installations were better understood, they were also more appreciated.

The results obtained may have some implications for museum and art gallery staff. The context of the gallery increased the aesthetic experience of the recipients. However, for recipients who view exhibitions of art installations outside the gallery, one can influence the improvement of aesthetic experiences by providing them with a curatorial description of the works of art. Contextual information can be available, for example, on galleries' websites, and it is worth providing curatorial information connected with photos or videos presenting a piece of work of art on these sites.

Acknowledgements The proofreading was funded by the University of Warsaw grant BST 1868-2018. The authors would like to thank the anonymous reviewers for their detailed comments and helpful critical remarks on an earlier version of this article. Special thanks go to the contemporary art gallery Galeria Labirynt in Lublin, Agata Sztorc and Marta Szewczyk for their cooperation in conducting this study, and to Milan Pupezin for his linguistic remarks.

Compliance with Ethical Standards

Conflict of Interest The authors declare no potential (financial or non-financial) conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. The current study was approved by the the Ethics Committee of Institute of Psychology at the John Paul II Catholic University of Lublin.

Informed Consent Written informed consent was obtained from all individual participants included in the study prior to data collection.

Appendix

Works shown in the interactive *Art Ingredients* exhibition

1. Basia Bańda and Tomasz Relewicz, *Sunflower* (2018) [Pol. *Słonecznik*]

Possible interaction with the artwork:

Arranging constructions from coloured elements of various shapes and textures that connect as a result of hidden magnets.

Curatorial information:

“There is a rock formation called *Sunflower* in the higher part of the Karkonosze. It is a hill that survived erosion by wind and rain and is made of several cracked granite monadnocks. *Sunflower* is the most famous and best visible rock formation in the Karkonosze. Its unique shape is the effect of a very slow and natural weathering process where elements less resistant to weather conditions are gradually removed and the solid rock remains. *Sunflower* rises up to the sky like a flower but it is not the real origin of the rock’s name. This comes from when the locals could tell it was noon when the sun was up above the rock. The work of Basia Bańda and Tomek Relewicz is composed of several elements of different shapes, just like the *Sunflower* rock. They can be freely combined to create your own rock formations. They are connected by magnets, just as in the Solar System, the Sun in the *Sunflower* rises up to the sky like a flower, the Sun in the centre and celestial bodies are bound by gravitation.”

2. Alicja Bielawska, *At This Time of Day Even Shadows Have Colours* (2018) [Pol. *O tej porze dnia nawet cienie są w kolorze*]

Possible interaction with the artwork:

Entering interior spaces surrounded by colourful fabrics; sitting or lying on colourful mattresses that are arranged inside these spaces on the floor; changing mattresses in places and combining them with tissues of a different colour.

Curatorial information:

“The light lets us see the colours. We can see how different a colour is in natural or artificial light and depending on the time of day. Each of us sees

colours differently. We have different associations with each colour depending on our memories. Alicja Bielawska wanted to literally immerse herself in colours so she created spaces inviting visitors to stay among colours. Using thin fabrics gently transmitting light, the artist separated circular rooms. Those small spaces with waving walls give visitors the chance not only to see but to feel the colour as well. The colours may be as fleeting as light or as palpable as the texture of the fabric. The colours of hanging fabrics are matched with mattresses where visitors may sit or rest or move around to see how the colours interact, attract or repel each other.”

3. Zuzanna Czebatul, *Love and Anger Intertwined* (2017) [Pol. *Przeplatanie miłości i gniewu*]

Possible interaction with the artwork:

Laying soft elements (resembling toys in the shape of elongated hands and legs) creating an installation in a pattern/tangle according to one’s own preferences; covering the elements of the installation; walking in the tangle of elements or lying on/under/between them.

Curatorial information:

“They say there is a thin line between love and hatred. These two feelings can intertwine and sometimes it is hard to say if we would like to hug, or rather kick a person. Zuzanna Czebatul, the artist, illustrated this relationship with objects that are soft to the touch and shaped like human arms and feet. Intertwined, they create a composition where it’s impossible to tell the upper and lower limbs apart. We can manipulate them as we wish; give a high-five or get a hug and become lost in the tangle of nice shapes.”

4. Michał Frydrych, *How to Protect Yourself From the Moon Thieves?* (2018) [Pol. *Jak bronić się przed złodziejami księżycą?*]

Possible interaction with the artwork:

Arranging the revolver from the available elements (which is impossible, because there are a lot of the parts resembling elements of a revolver, but which cannot be combined in a whole – however, viewers are not informed of this) or something else entirely, according to one’s own wishes.

Curatorial information:

“If there is one thing we are born with, it must be the unrestricted ability to create and abandon imaginary worlds. The younger we are, the better we are at it. We easily jump between the roles, from lion tamers to space conquerors. We tend to live in worlds magically created by books, films, and computer games. And we change the realms as easily as others change socks. However, it does not last forever. The world mischievously deprives us of the freedom we are born with and, before we know it, we become prisoners of the one common reality with processes beyond our control. Freedom must be protected! Michał Frydrych gives us the gun to arm us for the fight. The enlarged and disassembled in to dozens of parts Beretta 92 FS model is painted in cheerful colours. Girls and boys, women and men, all can play with it. You can do with it anything your imagination tells you to; build a skyscraper, igloo, barricade, canoe, or threaten the moon thieves. It’s an experiment. We’ll see if it works.”

5. Barbara Gryka, *What Is in the Head?* (2018) [Pol. *Co się w głowie mieści?*]

Possible interaction with the artwork:

Drawing lots of cards with saved pairs of opposing emotions; drawing images of these emotions on the wall with crayons inside a marked area.

Curatorial information:

“The artist seeks to understand how children perceive emotions. Do they understand what is happening to them when they feel grief, joy, or anger? During the exhibition, the children will illustrate pairs of emotions. They will create portraits of abstract concepts. At the end of the exhibition, the artist will make soft toys according to children’s works. This artwork is a kind of experiment that Gryka wants to conduct at the exhibition. She will verify if all children perceive emotions in similar ways and if it is possible to recreate them in a visual shape.”

6. Mateusz Kula, *Hello, Fun Adventure!* (2018) [Pol. *Witaj, wesola przygodo!*]

Possible interaction with the artwork:

Entering the room created by the artist; lying on the bed; sitting on a large inflatable ball; climbing onto the balcony protruding from the wall; changing clothes hanging on hangers; looking over colourful magazines.

Curatorial information:

“When you leave a room, you enter the backyard; and going back - when you leave the backyard, you enter the room. Mateusz Kula’s installation is a combination of the two spaces. It contains elements taken from reality and transformed by the artist: enlarged balls from children’s toys, a twisted carpet hanger, a bed, or a mysterious balcony protruding from the wall. All elements are tightly covered with wallpapers with enlarged graphics taken from computer and role-playing games. These are not specific shapes but rather small abstract parts of graphics from gaming magazines like *The Secret Service*, *The Gambler*, and *Sword and Sorcery* [*Magia i Miecz*], etc. A collection of costumes supplements the installation. Wearing them, the visitors become part of the installation and their activity complements the space designed by the artist.”

7. Sarah Evelyn Marsh, *Connection* (2018) [Pol. *Połączenie*]

Possible interaction with the artwork:

Bending longitudinal elements and combining them into different structures; touching and sniffing existing or created structures.

Curatorial information:

“Each of us has drawn at least one line in our lifetime. Perhaps it was a straight line or a swirl, thick or thin, a careless scribble, or a careful work. What would happen if a flat line went into space? Would it still retain all its properties? Sarah Evelyn Marsh encourages you to enter into an artwork and experience the spatial lines with your hands and feet and skin. You can move the objects and change their form and shape. What happens to them then? Do they become part of your body, an additional element or your safe shelter? Each object has a unique texture, colour, and smell. It takes time to test all the options. The photographs can be seen as tips and inspirations to create your own layouts and meanings.”

8. Aleka Polis, *Cyclooxitocine (United Colors of the Skin)* (2007–2018) [Pol. *Cyklooksytyocyna (Zjednoczone kolory skóry)*]

Possible interaction with the artwork:

Laying the tower with cubic sponge elements – the largest at the base, smaller and smaller at the next levels of the tower; arranging any other construction of cubic coloured elements of various sizes (e.g. a wall or a house).

Curatorial information:

“The idea was born during a scholarship in Stockholm in 2007 at the *Day of Languages*. Four colours symbolize the four skin colours which stand for the multiculturalism of modern society and intertwining cultures. A tower and a mural – guards of the right to freedom for all the people regardless of skin colour, political views, origin, and religion. Each cube is half the volume of the previous one. Towards the end, they have almost the same colour. Four squares (in a two-dimensional version) or cubes (in a three-dimensional version) are the beginning and the base of this form. The form has its beginning but no end. The base can be endlessly divided by adding ever smaller modules. This form was displayed in the *Follow the White Rabbit [Podążaj za białym królikiem]* exhibition in Bunkier Sztuki in 2010 and in Museum am Ostwall in Dortmund in 2012 as a spatial model with an infinite number of four divisions.”

9. Kamil Stańczak, *Hypno-Paintings* (2018) [Pol. *Hipnoobrazy*]

Possible interaction with the artwork:

Rotating each of two adjacent paintings in the same or opposite direction, at identical or different speeds.

10. Kamil Stańczak, *Stream* (2018) [Pol. *Strumień*]

Possible interaction with the artwork:

Spinning a crank at different speeds, which puts the mechanism of the *Stream* in motion.

11. Kamil Stańczak, *Magnetic Malewicz* (2018) [Pol. *Malewicz magnetyczny*]

Possible interaction with the artwork:

Arranging magnetic elements on the canvas (it is possible to form a figurative composition referring to Malewicz’s artwork or any other composition).

Curatorial information to Kamil Stańczak’s installations:

“The hypnotic, rotating images are inspired by a simple observation of sunrises and sunsets. The immovable orange dot symbolizes the central star of the Solar System, with geometric shapes rotating around it like parts of a landscape. The starting point of the perfectly traditional painting on canvas was a digital camera picture. The artist creates pairs of almost identical images with slight

differences in small elements. Starting with the observation of nature, the artist simplifies the landscape, transfers it on to canvas and sets it in motion resembling the moving image on a telephone or camera screen.

A similar principle is used in the painting machine – *Stream*. It is a recording of the paint dripping off a wall or the painting process illustrated by the special construction of several dozen colourful spots.

Magnetic Malewicz invites you to play with a reproduction of a painting by the famous avant-garde artist. Stańczak notices a certain similarity of colour elements on Malewicz’s paintings with simple children’s puzzles and illustrations and invites viewers to create their own version of the painting.”

Open Access This article is distributed under the terms of the Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made.

References

- Barry, M. (2014). Please do touch: Discourses on aesthetic interactivity in the exhibition space. *Participations*, *11*(1), 216–236.
- Belke, B., Leder, H., Strobach, T., & Carbon, C. C. (2010). Cognitive fluency: High-level processing dynamics in art appreciation. *Psychology of Aesthetics, Creativity, and the Arts*, *4*(4), 214–222. <https://doi.org/10.1037/a0019648>.
- Bock, R. D. (1975). *Multivariate statistical methods in behavioural research*. New York: McGraw-Hill.
- Brieber, D., Nadal, M., Leder, H., & Rosenberg, R. (2014). Art in time and space: Context modulates the relation between art experience and viewing time. *PLoS One*, *9*, e99019. <https://doi.org/10.1371/journal.pone.0099019>.
- Brieber, D., Leder, H., & Nadal, M. (2015a). The experience of art in museums: An attempt to dissociate the role of physical context and genuineness. *Empirical Studies of the Arts*, *33*(1), 95–105. <https://doi.org/10.1177/0276237415570000>.
- Brieber, D., Nadal, M., & Leder, H. (2015b). In the white cube: Museum context enhances the valuation and memory of art. *Acta Psychologica*, *154*, 36–42. <https://doi.org/10.1016/j.actpsy.2014.11.004>.
- Cupchik, G. C., Shereck, L., & Spiegel, S. (1994). The effects of textual information on artistic communication. *Visual Arts Research*, *20*(1), 62–78.
- Dezeuze, A. (Ed.). (2010). *The do-it-yourself artwork: Participation from Fluxus to new media*. Manchester and New York: Manchester University Press.
- Epstein, S. (2003). Cognitive-experiential self-theory. In *Handbook of personality: Theory and research* (pp. 165–192). Hoboken: John Wiley & Sons, Inc. <https://doi.org/10.1002/0471264385.wei0507>.
- Gerger, G., & Leder, H. (2015). Titles change the aesthetic appreciations of paintings. *Frontiers in Human Neuroscience*, *9*, 464. <https://doi.org/10.3389/fnhum.2015.00464>.

- Grüner, S., Specker, E., & Leder, H. (2019). Effects of context and genuineness in the experience of art. *Empirical Studies of the Arts*, 37, 138–152. <https://doi.org/10.1177/0276237418822896>.
- Hayn-Leichsenring, G. U. (2017). The ambiguity of artworks—a guideline for empirical aesthetics research with artworks as stimuli. *Frontiers in Psychology*, 8, 1857. <https://doi.org/10.3389/fpsyg.2017.01857>.
- Herbette, G., & Rimé, B. (2004). Verbalization of emotion in chronic pain patients and their psychological adjustment. *Journal of Health Psychology*, 9(5), 661–676. <https://doi.org/10.1177/1359105304045378>.
- Imbir, K. (2015). Affective norms for 1,586 polish words (ANPW): Duality-of-mind approach. *Behavior Research Methods*, 47(3), 860–870. <https://doi.org/10.3758/s13428-014-0509-4>.
- Imbir, K. (2016a). Affective norms for 4900 Polish words reload (ANPW_R): Assessments for valence, arousal, dominance, origin, significance, concreteness, imageability and, age of acquisition. *Frontiers in Psychology*, 7, 1081. <https://doi.org/10.3389/fpsyg.2016.01081>.
- Imbir, K. (2016b). From heart to mind and back again. A duality of emotion overview on emotion-cognition interactions. *New Ideas in Psychology*, 43, 39–49. <https://doi.org/10.1016/j.newideapsych.2016.04.001>.
- Imbir, K., & Gołąb, M. (2017). Affective reactions to music: Norms for 120 excerpts of modern and classical music. *Psychology of Music*, 45(3), 432–449. <https://doi.org/10.1177/0305735616671587>.
- Jarymowicz, M., & Imbir, K. (2015). Toward a human emotions taxonomy (based on their automatic vs. reflective origin). *Emotion Review*, 7(2), 183–188. <https://doi.org/10.1177/1754073914555923>.
- Jucker, J.-L., Barrett, J. L., & Wlodarski, R. (2014). "I just don't get it": Perceived artists' intentions affect art evaluations. *Empirical Studies of the Arts*, 32(2), 149–182. <https://doi.org/10.2190/EM.32.2.c>.
- Kapoula, Z., Adenis, M.-S., Lê, T.-T., Yang, Q., & Lipede, G. (2011). Pictorial depth increases body sway. *Psychology of Aesthetics Creativity and the Arts*, 5, 186–193. <https://doi.org/10.1037/a0022087>.
- Lang, P. J. (1980). Behavioral treatment and bio-behavioral assessment: Computer applications. In J. B. Sidowski, J. H. Johnson, & T. A. Williams (Eds.), *Technology in mental health care delivery systems* (pp. 119–137). Norwood: Ablex. Retrieved from <http://ps.psychiatryonline.org/article.aspx?articleid=67156>
- Leder, H., Belke, B., Oeberst, A., & Augustin, D. (2004). A model of aesthetic appreciation and aesthetic judgments. *British Journal of Psychology*, 95(Pt 4), 489–508. <https://doi.org/10.1348/0007126042369811>.
- Leder, H., Carbon, C.-C., & Ripsas, A.-L. (2006). Entitling art: Influence of title information on understanding and appreciation of paintings. *Acta Psychologica*, 121(2), 176–198. <https://doi.org/10.1016/j.actpsy.2005.08.005>.
- Locher, P., & Dolese, M. (2004). A comparison of the perceived pictorial and aesthetic qualities of original paintings and their postcard images. *Empirical Studies of the Arts*, 22(2), 129–142. <https://doi.org/10.2190/EQTC-09LF-JRHA-XKJT>.
- Locher, P. J., Smith, L. F., & Smith, J. K. (1999). Original paintings versus slide and computer reproductions: A comparison of viewer responses. *Empirical Studies of the Arts*, 17(2), 121–129. <https://doi.org/10.2190/R1WN-TAF2-376D-EFUH>.
- Locher, P. J., Smith, J. K., & Smith, L. F. (2001). The influence of presentation format and viewer training in the visual arts on the perception of pictorial and aesthetic qualities of paintings. *Perception*, 30(4), 449–465. <https://doi.org/10.1068/p3008>.
- Millis, K. (2001). Making meaning brings pleasure: The influence of titles on aesthetic experiences. *Emotion*, 1(3), 320–329. <https://doi.org/10.1037/1528-3542.1.3.320>.
- Moors, A., De Houwer, J., Hermans, D., Wanmaker, S., van Schie, K., Van Harmelen, A.-L., et al. (2013). Norms of valence, arousal, dominance, and age of acquisition for 4,300 Dutch words. *Behavior Research Methods*, 45(1), 169–177. <https://doi.org/10.3758/s13428-012-0243-8>.
- Mullennix, J. W., Pilot, K. M., Steeves, T. A., & Burns, J. C. (2018). The effects of cognitive load on judgments of titled visual art. *Psychology of Aesthetics, Creativity, and the Arts*, 12(2), 166–176. <https://doi.org/10.1037/aca0000128>.
- Osgood, C. E., Suci, G. J., & Tannenbaum, P. H. (1957). *The measurement of meaning*. Urbana: University of Illinois Press.
- Pekarik, A. J. (2004). To explain or not to explain. *Curator*, 47(1), 12–18. <https://doi.org/10.1111/j.2151-6952.2004.tb00363.x>.
- Pelowski, M., Forster, M., Tinio, P. P. L., Scholl, M., & Leder, H. (2017a). Beyond the lab: An examination of key factors influencing interaction with 'real' and museum-based art. *Psychology of Aesthetics, Creativity, and the Arts*, 11(3), 245–264. <https://doi.org/10.1037/aca0000141>.
- Pelowski, M., Gerger, G., Chetouani, Y., Markey, P. S., & Leder, H. (2017b). But is it really art? The classification of laboratory-presented images as "art"/"not art" and correlations with appraisal and viewer interpersonal differences. *Frontiers in Psychology*, 8, 1729. <https://doi.org/10.3389/fpsyg.2017.01729>.
- Pelowski, M., Leder, H., Mitschke, V., Specker, E., Gerger, G., Tinio, P. P. L., Vaporova, E., Bieg, T., & Husslein-Arco, A. (2018a). Capturing aesthetic experiences with installation art: An empirical assessment of emotion, evaluations, and mobile eye tracking in Olafur Eliasson's "baroque, baroque!". *Frontiers in Psychology*, 9, 1255. <https://doi.org/10.3389/fpsyg.2018.01255>.
- Pelowski, M., Specker, E., Gerger, G., Leder, H., & Weingarden, L. S. (2018b). Do you feel like I do? A study of spontaneous and deliberate emotion sharing and understanding between artists and perceivers of installation art. *Psychology of Aesthetics, Creativity, and the Arts*. <https://doi.org/10.1037/aca0000201>.
- Reber, R., Schwarz, N., & Winkielman, P. (2004). Processing fluency and aesthetic pleasure: Is beauty in the perceiver's processing experience? *Personality & Social Psychology Review*, 8(4), 364–382. https://doi.org/10.1207/s15327957pspr0804_3.
- Russell, P. A. (2003). Effort after meaning and the hedonic value of paintings. *British Journal of Psychology*, 94(1), 99–110. <https://doi.org/10.1348/000712603762842138>.
- Russell, P. A., & Milne, S. (1997). Meaningfulness and the hedonic value of paintings: Effects of titles. *Empirical Studies of the Arts*, 15(1), 61–73. <https://doi.org/10.2190/EHT3-HWVM-52CB-8QHJ>.
- Smith, J. K., & Smith, L. F. (2001). Spending time on art. *Empirical Studies of the Arts*, 19(2), 229–236. <https://doi.org/10.2190/5MQM-59JH-X21R-JN5J>.
- Smith, J. K., Smith, L. F., & Tinio, P. L. (2017). Time spent viewing art and reading labels. *Psychology of Aesthetics Creativity and the Arts*, 11(1), 77–85. <https://doi.org/10.1037/aca0000049>.
- Specht, S. M. (2010). Artists' statements can influence perceptions of artwork. *Empirical Studies of the Arts*, 28(2), 193–206. <https://doi.org/10.2190/EM.28.2.e>.
- Specker, E., Tinio, P. P. L., & Van Elk, M. (2017). Do you see what I see? An investigation of the aesthetic experience in the laboratory and museum. *Psychology of Aesthetics, Creativity, and the Arts*, 11(3), 265–275. <https://doi.org/10.1037/aca0000107>.
- Specker, E., Forster, M., Brinkmann, H., Boddy, J., Pelowski, M., Rosenberg, R., & Leder, H. (2018). The Vienna art interest and art knowledge Questionnaire (VAIAK): A unified and validated measure of art interest and art knowledge. *Psychology of Aesthetics, Creativity, and the Arts*. <https://doi.org/10.1037/aca0000205>.
- Swami, V. (2013). Context matters: Investigating the impact of contextual information on aesthetic appreciation of paintings by Max Ernst and Pablo Picasso. *Psychology of Aesthetics, Creativity, and the Arts*, 7(3), 285–295. <https://doi.org/10.1037/a0030965>.
- Szubielska, M. (2018). Wpływ zajęć edukacyjnych prowadzonych w galerii na odbiór abstrakcyjnej sztuki współczesnej przez uczniów młodszych klas szkoły podstawowej [The influence of educational workshops held in a gallery on the reception of abstract

- contemporary art by primary education students]. *Przegląd Badań Edukacyjnych [Educational Studies Review]*, 26(1), 21–44. <https://doi.org/10.12775/PBE.2018.002>.
- Szubielska, M., Francuz, P., Niestorowicz, E., & Bałaj, B. (2018a). The impact of reading or listening to a contextual information relating to contemporary paintings on the evaluation by non-experts in the field of art. *Polskie Forum Psychologiczne / Polish Psychological Forum*, 23(3), 610–627. <https://doi.org/10.14656/PFP20180309>.
- Szubielska, M., Ratomska, M., Wójtowicz, M., & Szymańska, A. (2018b). The effect of educational workshops in an art gallery on children's evaluation and interpretation of contemporary art. *Empirical Studies of the Arts*. <https://doi.org/10.1177/0276237418790917>.
- Szubielska, M., Wójtowicz, M., Szymańska, A., Ratomska, M., & Sztorc, A. (2018c). Ocena estetyczna sztuki współczesnej przez dzieci przedszkolne i wczesnoszkolne [Contemporary art esthetic judgment by pre-school children and primary school pupils]. *Edukacja*, 2(145), 43–63. <https://doi.org/10.24131/3724.180203>.
- Tröndle, M., Kirchberg, V., & Tschacher, W. (2014). Is this art? An experimental study on visitors' judgement of contemporary art. *Cultural Sociology*, 8, 310–332. <https://doi.org/10.1177/1749975513507243>.
- Tschacher, W., Greenwood, S., Kirchberg, V., Wintzerith, S., van den Berg, K., & Tröndle, M. (2012). Physiological correlates of aesthetic perception of artworks in a museum. *Psychology of Aesthetics, Creativity, and the Arts*, 6(1), 96–103. <https://doi.org/10.1037/a0023845>.
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, 54(6), 1063–1070. <https://doi.org/10.1037/0022-3514.54.6.1063>.

Publisher's note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.