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Entitling art: Influence of title information on understanding and appreciation of paintings

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Abstract

There is evidence that presenting titles together with artworks affects their processing. We investigated whether elaborative and descriptive titles change the appreciation and understanding of paintings. Under long presentation times (90 s) in Experiment 1, testing representative and abstract paintings, elaborative titles increased the understanding of abstract paintings but not their appreciation. In order to test predictions concerning the time course of understanding and aesthetic appreciation [Leder, H., Belke, B., Oeberst, A., & Augustin, D. (2004). A model of aesthetic appreciation and aesthetic judgments. *British Journal of Psychology*, *95*(4), 489–508] in Experiment 2, abstract paintings were presented under two presentation times. For short presentation times (1 s), descriptive titles increased the understanding more than elaborative titles, whereas for medium presentation times (10 s), elaborative titles increased the understanding more than descriptive titles. Thus, with artworks a presentation time of around 10 s might be needed, to assign a meaning beyond the mere description. Only at medium presentation times did the participants with more art knowledge have a better understanding of the paintings than participants with less art knowledge. Thus, it seems that art knowledge becomes significant, if there is sufficient time to assign a meaning and the present studies reveal the importance of considering the time course in aesthetic appreciation.

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1. Introduction

Since the late 19th century (Fechner, 1876), the individual aesthetical experience, provoked by a stimulus or an artwork, became the main topic in psychological aesthetic research. The appreciation of artworks is thought to involve an ongoing elaboration of meaning in an "open" and "indeterminate" image (Cupchik, Shereck, & Spiegel, 1994). The appreciation of artworks is not the mere assignment of an established meaning, but involves an ongoing evaluation of the painting, which generates an incomplete impression, leaving room for further interpretation. It is assumed that part of the pleasure derived from looking at a painting is the feeling of having grasped the meaning and the understanding of it (Russell, 2003; Russell & Milne, 1997). Recently, Leder, Belke, Oeberst, and Augustin (2004) proposed a stage model for aesthetic processing, which combines aspects of understanding and cognitive mastering with affective and emotional processing. A short version of the model is depicted in Fig. 1.

According to the model, aesthetic processing of an artwork involves a number of processing stages, which might somehow proceed sequentially and therefore allow the formulation of hypotheses concerning time sensitive processing of art. After initially classifying a stimulus as an artwork, features such as colour, shape, contrast, etc. are analyzed in the perceptual processing stage. In the next stage, implicit memory effects such as familiarity and prototypicality are analyzed. The content (in representational paintings) and style (particularly in abstract art) are analyzed through a stage of explicit classification. With increasing expertise, the processing of style becomes more dominant (Cupchik, 1992). Essential in the model is the need to understand an artwork. This is accomplished in a stage of "cognitive mastering" which builds a feedback-loop with a stage of evaluation, in which affective and cognitive measures trigger further processing or the formation of aesthetic judgments and the experience of aesthetic emotions.

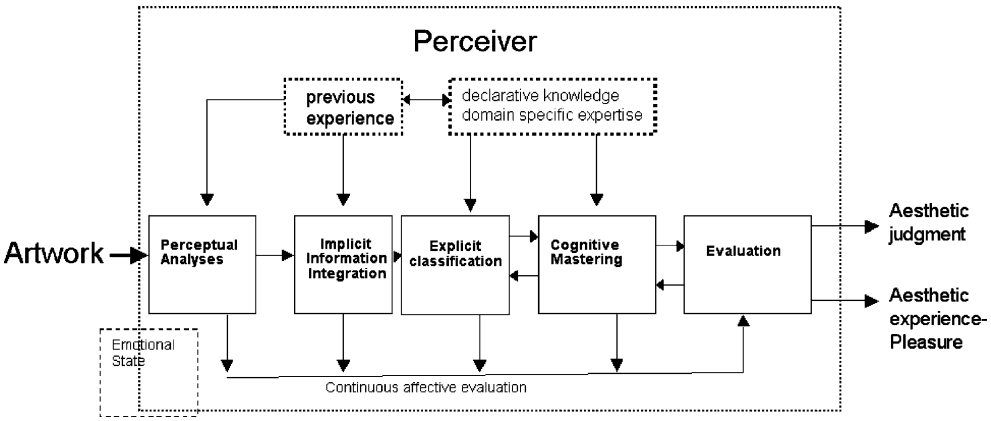

Fig. 1. Processing stages in aesthetic experiences (adapted from Leder et al., 2004).

If understanding and grasping the meaning is essential, as proposed in the model, then information which helps to interpret the image must affect aesthetic processing. Here we present a study in which we investigate how verbal information affects cognitive and affective components in the processing of abstract and representational artworks. However, the temporal structure of the model is not yet clear. Although Bachmann and Vipper (1983) showed that some information in artworks is available after short presentation times, it might well be that understanding an artwork requires some time. In the present study, we test the temporal properties of aesthetic appreciation indirectly in that we compare the effect of descriptive titles and elaborative titles for artworks under short and longer presentation times (Experiments 2a and 2b). Descriptive titles should be effective when the output of the model is based on the results of earlier stages such as perceptual analyses and explicit classification of content, while elaborative titles presumably affect the stage of evaluation and understanding which according to the model comes later and presumably needs more time.

Some studies investigated changes in aesthetic evaluation of artworks as a function of accompanying verbal information. Cupchik et al. (1994) showed that interpretative activity increased the perception of the artworks concerning their power, challenge, and personal meaning. Cupchik and Gebotys (1988) suggested that an indication of such an elaboration process would be a heightened appreciation of the interpretative challenge of the artwork. As liking and preference are most frequently measured in studies of art appreciation, it would be important to see whether an elaboration process also results in higher ratings for liking.

Short verbal information in the form of titles, besides the purpose of identification, serves as a guide to the interpretation of an artwork (Franklin, 1988). Some artworks cause tension between title and artwork. This can be resolved by reworking the visual configuration and the meaning of the title until some kind of correspondence or "fit" is established between the two. This process was seen as an important part of aesthetic experience, for example by Kreitler and Kreitler (1972). In order to investigate these hypotheses, Franklin, Becklen, and Doyle (1993) studied how viewers responded to a painting under different titling conditions. Viewers were shown each of the two paintings twice—on one occasion with the original title, on the another occasion with a fabricated one. In the first session, participants viewed both the paintings with one of its two titles. In the second session, they viewed both paintings again, in the same order. For the first painting shown, the title was the same as in the first session, for the second painting, an alternate title was presented. The researchers found that a change of title shifted the description of the artwork towards the meaning of the title, although the looking pattern measured by registering eye movements did not change. Thus, while the visual processing was rather unaffected by the title, the semantic processing changed. However, affective responses to the paintings (e.g., liking) were not measured.

Millis (2001) examined the effects of different titling conditions, where participants rated illustrations and photographs for understanding and four qualities of the aesthetic experience (liking, interest, elicited thoughts and emotions). Descriptive and elaborative titles increased the comprehension of both materials. Furthermore, for illustrations, elaborative titles, which provided an explanation or a metaphoric interpretation of the scene, increased the aesthetic experience more than descriptive titles. This was interpreted as an increase of aesthetic experience due to elaboration. Millis assumed that titles only increase aesthetic experiences when they contribute to rich and coherent representations. As the

stimuli used by Millis did not consist of artworks, it is worthwhile to study the effect of paintings by artists of high art. Leder et al. (2004) considered this to be of particular importance, because a preclassification of an object as an artwork might be a necessary condition for aesthetic experiences. Moreover, in Millis's study, the analysis of aesthetic experience as a combination of four variables did not show which of the aspects of aesthetic experience changed due to the elaboration effect. Thus, in the present study we investigated the effects of elaboration separately for the four variables of aesthetic experience, using reproductions of artworks.

Recently, Russell (2003) performed a similar study, also by using artworks to test Bartlett's concept of *effort after meaning* (Bartlett, 1932). In accordance with Bartlett's prediction, in a within-subjects design, Russell (2003) found an increase in the meaningfulness and hedonic value from first to second ratings when the paintings were presented with descriptions in the second phase (description plus title and the artist's name). In Russell's study, images of abstract and semiabstract art were presented. A comparison between abstract and representational art was not made. Two dependent variables, meaningfulness and pleasingness, were studied. Influences of other aspects like art interest, and art knowledge were not considered. Consequently, in our study we used measures similar to Millis (2001). We also examined expertise and interest in art and applied a within-participants experimental design.

In Experiment 1, we systematically compared participants' ratings to abstract and representational artworks. Studies on art perception and evaluation have shown that art novices prefer representational artworks to abstract artworks (e.g., O'Hare & Gordon, 1977). Moreover, abstract artworks carry meaning either in terms of free interpretations, often referring to the painter's expressiveness (Parsons, 1987) or simply by their style. With expertise, an abstract painting can be meaningful in terms of its historical background or conceptual level. For example, Malevich's "white square" stretched the concept of abstract art to its limits by presenting a shape that was mainly determined by the canvas and by using a "non-colour". The meaning is often revealed in the title, which either accompanies the painting or is part of the perceiver's knowledge. In contrast, representational artworks also carry meaning in terms of what is depicted and their content (Leder et al., 2004). In this study, we investigated how these classes of paintings are affected by either descriptive or elaborative titles.

Another aim of the present study was to get a better understanding of the time course of aesthetic processing. If aesthetic experience consists of a sequence of processing stages (Kreitler & Kreitler, 1972; Leder et al., 2004), then the effect of titles accompanying the artwork might also depend on temporal properties. However, Bachmann and Vipper (1983) found that by limiting presentation times of artworks, a lot of information could be very swiftly accessible, including major information on art styles. In the present study, we investigated whether different presentation times reveal a differential effect of descriptive and elaborative titles. When processing time of an artwork is limited, a descriptive title might enhance understanding because it helps to access the content, particularly in abstract art. On the other hand, elaborative titles might change the processing of meaning at a later processing stage, and thus might require more time to have an effect.

In order to investigate effects of exposure times, we selected presentation times (in Experiment 2) similar to previous studies where artworks were also used in the investigation. In Experiment 2a, we used a short presentation time of 1 s, which presumably elicits a spontaneous judgment. In Experiment 2b, a presentation time of 10 s was used. Cupchik

and Gebotys (1988) asked their participants to arrange slides of three paintings or sculptures, which were presented in a sequence for 10 s each, which reflected the stylistic change between the paintings. Hess and Wallsten (1987) presented artworks for 10 s, after which participants were asked to assign the artworks to two artists. In a paired comparison task, O'Hare and Gordon (1977) asked the participants to judge the similarity of two artworks. After a familiarization time of 1 min, the artwork pairs were presented for 10 s. Therefore, we assume that a presentation time of 10 s would be sufficient for an interpretative activity of a painting.

2. The present study

In the present study, we examined the influence of descriptive and elaborative titles on paintings. Additionally, we varied the presentation time between Experiments 1 and 2. The first experiment was designed similar to Millis (2001) to replicate his elaboration effect with images of artworks. Two levels of representativeness in artworks were investigated (abstract versus representational). Ratings were collected before and after presenting a title, thus within-subjects comparisons could be made. We chose two paintings similar in an artistic style and contents from 24 artists each, and presented each painting only once to avoid an increase of appreciation due to mere exposure.

In the first experiment, the effects of the titling conditions (as independent variables) were investigated for six different seven-point scales (the dependent variables) which comprise cognitive as well as affective aspects of aesthetic processing (Leder et al., 2004): (a) *Understanding* was measured by the scale whether the participants believed to have understood the artist's intention; (b) *Meaning* by whether they found a personal meaning in the artwork; (c) *Liking* by whether they liked the artwork; (d) *Interest* by whether the artwork evoked their interest; (e) *Emotion* by whether the artwork affected them emotionally; and (f) *Thoughts* by whether the artwork evoked thoughts in them. All ratings were given on a seven-point scale from 1 (fully agree) to 7 (fully disagree). The aim of Experiment 1 was to identify which aspect of aesthetic processing of artworks is affected by descriptive or elaborative titles. In general, as aesthetic experiences with artworks require a certain level of understanding, thus elaborative titles were thought to affect cognitive measures such as understanding and meaning. Moreover, interest in art was also measured as a quasiexperimental interpersonal difference in order to confirm that increased interest reveals higher understanding, but also to see whether interest in art interacts with any of the other variables.

To better understand the changes in understanding found in Experiment 1, Experiment 2 investigated the effects of presentation time on ratings of liking and understanding of abstract paintings. Reaction times were collected and effects of art interest, and art knowledge considered.

3. Experiment 1

3.1. Method

3.1.1. Participants

Forty-eight students, 24 of them females, participated in Experiment 1. Mean age was 26.2 years [range: 19–45]. Thirty-five of the participants were Psychology students from

the Freie Universität Berlin. They received course credit for their participation. Thirteen students from other departments were paid 10€ for their participation.

3.1.2. Materials

Forty-eight images of paintings, two by 24 artists, both similar in artistic style and content, were selected from art books and magazines for the experiment. For example, two paintings by the artist Lovis Corinth were chosen which both depicted views of the Walchensee. Twenty-four representational paintings from 1900 to 1930 were selected from art styles such as Expressionism and Cubism, e.g., paintings by Lovis Corinth and Lyonel Feininger (see Appendix A for a list of stimuli). The representational paintings depicted landscape sceneries and buildings. Paintings likely unknown to art novices were chosen in order to avoid preferences due to previous encounters. Another set of 24 abstract paintings (from 1950 to 1990) contained artworks of Abstract Expressionism and Action Painting, e.g., paintings by Franz Kline and Jackson Pollock. The paintings were presented consecutively in four sets of 12 paintings put together in a pseudo-randomized order. Each participant was exposed to a total of 48 paintings.

For each picture pair of two paintings by the same artist, two different titles were produced. Three members of our research team invented two different types of titles for the paintings, partly referring to the descriptions of the artistic styles in art books. The descriptive titles summarized the most important aspects of the painting in a few descriptive words, e.g., "Lakeside View" or "Fine curved lines in colour". Elaborative titles provided a possible interpretation or explanation of the artwork. For example, the paintings by Jackson Pollock were entitled "Impulsiveness" (see Appendix A for a complete list of all artists and titles).

In a pre-study with six art novices (mean age: 29.3 years; four females), we ask for classifying the material in order to validate that the pictures belong to the correct class of Representativeness (abstract, representative) and whether the selected titles were fitting with the pictures. Concerning the classification of Representativeness, participants agreed by 91.0% with the pre-selected assignment. For the validation of the title assignment, a list of all titles of pictures used in Experiment 1 were provided to the participants, from which they had to select three most suitable out of all possible for every single picture. Of these three selected titles they had to rank them according to the order of plausibility. In 79.4% of all cases, the assigned title matched with the group of three titles selected by the participants; in 54.6% of all cases, the participants first choice matched with the assigned title. Thus, the assignment of being abstract/representative and the assignment of titles were highly plausible.

3.1.3. Procedure

Experiment 1 was conducted in small groups consisting of two to five persons. Stimuli (resolution: 1280×1024, 85 Hz) were presented by PsyScope 1.2.5 PPC (Cohen, MacWhinney, Flatt, & Provost, 1993) on a Macintosh G4 computer. The participants were asked to sit in a semicircle around the monitor (21″). The distance between participant and the computer screen was about 1.20 m. The paintings were presented with a visual angle of about 7.2°. All participants completed one questionnaire for each painting, containing the six scales concerning (a) understanding the artist's intention, (b) personal meaning, (c) liking, (d) whether the artwork evoked their interest, (e) whether the artwork affected them emotionally, and (f) thoughts evoked by the artwork.

All participants completed the questionnaires within the presentation time for each painting.

Experiment 1 consisted of two parts, one using the abstract artworks, the other using the representational artworks. Each part consisted of two phases. This allows us to analyze both sorts of paintings separately. First participants were shown 12 artworks without titles in a randomized order to view for 60 s each (P1). During that time participants rated each painting separately. In the second phase (P2), the participants were given 12 similar artworks with one of the three possible title conditions: descriptive title, elaborative title, or no-title in a pseudo-randomized order to view. In order to make sure that there was enough time for processing the artworks and the titles the presentation time at test was increased to 90 s. As both presentation times allow exhaustive aesthetic experience these times were chosen, the additional time at test seemed not be critical, as it is no longer in a range in which presentation is critical, but rather both conditions support the participants in having full aesthetic experiences (Leder et al., 2004; Smith & Smith, 2001). The pseudo-randomized order ensured that the same titling condition did not appear more than twice in a row. The order of presentation of representational and abstract paintings, i.e. the order of *Representativeness*, was fully balanced between the participants. Moreover, assignment of paintings to each title condition also was balanced by using the Latin Square procedure and using groups of four images which were randomly put together into one title condition. Two practice trials at the beginning of the first part familiarized the participants with the questions asked and the procedure of the experiment; these trials were not further analyzed. The experiment was completed in about 90 min. At the end of the experiment, the participants were asked nine questions about their interest in art (see Appendix B). All ratings were given on a seven-point scale from 1 (fully disagree) to 7 (fully agree). We calculated mean ratings for the questions about art interest. A correlation analysis for the nine questions on art interest showed high correlations between all nine questions.

3.2. Results

3.2.1. Effects of titling conditions and representativeness on the aesthetic experience

First, we analyzed the mean ratings (and standard deviations) for *Title* (no-title, descriptive, elaborative), and *Representativeness* (representational, abstract) for the six scales (Table 1).

Pearson product moment correlations revealed medium up to highly significant correlations between the six variables, which enabled us to run a multivariate analysis of variance (MANOVA). Importantly, we separated the pictures used in test phase P1 in three different sets (no-title, descriptive, elaborative) corresponding with the three titling conditions in test phase P2. Thus, if, for instance, a painting of Paul Cézanne was assigned to the descriptive title condition in P2, then the corresponding painting of Cézanne presented in P1 was assigned to the so-called *descriptive* P1 condition. Note that this assignment does not reflect any change in the presentation mode but was only used to create matches of picture sets between P1 and P2 for analyzing the data in a full balanced analysis design. We analyzed the means of the six variables on aesthetic experience by a three-way MANOVA for repeated measurements. The within-subjects factors were *Phase* (P1, P2), *Representativeness* (representational, abstract) and *Title* (no-title, descriptive, elaborative). Mean ratings sampled over participants on each of the scales (understand-

Table 1
Mean aesthetic scores (and standard deviations) as a function of Scale, Title Representativeness in Experiment 1

Scale	Title					
	No-Title		Descriptive		Elaborative	
	M	SD	*M*	SD	*M*	SD
P1						
Understanding						
Representational	4.01	1.24	4.03	1.16	3.87	1.23
Abstract	2.40	1.22	2.42	1.00	2.41	0.94
Meaning						
Representational	4.09	1.45	4.19	1.29	4.00	1.33
Abstract	2.82	1.22	2.90	1.21	2.88	1.14
Liking						
Representational	3.91	1.08	4.04	1.17	3.99	1.06
Abstract	3.29	1.11	3.30	1.15	3.47	1.12
Interest						
Representational	3.47	1.11	3.61	1.20	3.62	1.01
Abstract	3.22	1.17	3.28	1.23	3.53	1.16
Emotions						
Representational	3.88	1.13	4.05	1.16	3.98	1.10
Abstract	3.26	1.08	3.54	1.17	3.53	1.31
Thoughts						
Representational	3.56	1.17	3.68	1.19	3.62	1.10
Abstract	3.39	1.12	3.53	1.18	3.68	1.00
P2						
Understanding						
Representational	3.92	1.32	4.03	1.23	4.16	1.27
Abstract	2.38	0.94	2.68	1.25	3.17	1.14
Meaning						
Representational	3.91	1.59	3.83	1.33	3.93	1.34
Abstract	2.80	1.07	2.70	1.15	2.88	1.11
Liking						
Representational	3.88	1.23	3.79	1.07	3.94	1.09
Abstract	3.28	1.03	3.06	0.99	3.16	1.04
Interest						
Representational	3.39	1.25	3.15	1.10	3.46	1.14
Abstract	3.00	1.08	2.80	1.17	2.93	1.11
Emotions						
Representational	3.79	1.20	3.72	1.17	3.85	1.09
Abstract	3.31	1.01	3.26	0.97	3.30	1.18
Thoughts						
Representational	3.36	1.27	3.17	1.81	3.52	1.19
Abstract	3.25	1.02	3.03	1.18	3.20	1.07

ing, meaning, liking, interest, emotions, and thoughts) were analyzed as dependent variables. The values of the MANOVA were calculated according to Wilks' Lambda. There were significant main effects of *Phase*, $F(6,42) = 13.11$, $p < .001$, $\eta_p^2 = .65$, *Representativeness*,

$F(6,42) = 21.60$, $p < .001$, $\eta_p^2 = .75$, and *Title*, $F(12,178) = 2.80$, $p < .01$, $\eta_p^2 = .16$, as well as a significant interaction between *Phase* and *Title*, $F(12,178) = 4.32$, $p < .01$, $\eta_p^2 = .23$. Furthermore, we computed univariate tests on each of the six dependent variables.

Main effects of *Phase* were found on all scales (Understanding, $F(1,47) = 10.62$, $p < .002$, $\eta_p^2 = .18$; Meaning, $F(1,47) = 6.29$, $p < .02$, $\eta_p^2 = .12$; Liking, $F(1,47) = 9.32$, $p < .005$, $\eta_p^2 = .17$; Interest, $F(1,47) = 38.79$, $p < .001$, $\eta_p^2 = .45$; Emotion, $F(1,47) = 7.39$, $p < .01$, $\eta_p^2 = .14$; Thoughts, $F(1,47) = 23.63$, $p < .001$, $\eta_p^2 = .34$). With the exception of the scale Understanding, all ratings decreased from P1 to P2. Moreover, main effects of *Representativeness* were found on all scales but the Thoughts Scale (Understanding, $F(1,47) = 104.77$, $p < .001$, $\eta_p^2 = .69$; Meaning, $F(1,47) = 54.08$, $p < .001$, $\eta_p^2 = .54$; Liking, $F(1,47) = 30.66$, $p < .001$, $\eta_p^2 = .40$; Interest, $F(1,47) = 5.59$, $p < .02$, $\eta_p^2 = .11$; Emotion, $F(1,47) = 27.89$, $p < .001$, $\eta_p^2 = .37$). Representational paintings revealed higher ratings than abstract paintings in all of these scales. Furthermore, main effects of *Title* were found for Understanding only, $F(2,94) = 8.78$, $p < .001$, $\eta_p^2 = .16$. Ratings given on elaborative titles were significantly higher than ratings on descriptive titles ($p < .05$) and higher than in the no-title condition ($p < .001$). Ratings on descriptive titles were significantly higher than ratings on no-title ($p < .05$); all differences were analyzed by Bonferroni-adjusted post hoc tests. The interaction between *Phase* and *Representativeness* was only significant for Understanding, $F(1,47) = 7.31$, $p < .01$, $\eta_p^2 = .14$. The same was found for the interaction between *Phase* and *Title*, $F(2,94) = 14.88$, $p < .001$, $\eta_p^2 = .24$ and the interaction between *Title* and *Representativeness*, $F(2,94) = 4.35$, $p < .02$, $\eta_p^2 = .09$. An analysis of simple main effects of *Title* on *Representativeness* revealed that the factor *Title* was significant for the abstract paintings, $F(2,46) = 8.57$, $p < .001$, $\eta_p^2 = .27$, but not for the representational paintings, $F(2,46) < 1$, *n.s.* No other effects were significant.

3.2.2. Influence of titles on understanding

As the understanding of paintings was only affected by different types of titles for abstract paintings, we ran a second ANOVA for the scale understanding including only abstract paintings. A two-way repeated measurement ANOVA with *Phase* and *Title* as within-subjects factor revealed that *Phase*, $F(1,47) = 17.31$, $p < .001$, $\eta_p^2 = .27$, and *Title*, $F(2,94) = 10.27$, $p < .001$, $\eta_p^2 = .18$, had a significant effect. Most interestingly, there was also an interaction between both factors, $F(2,94) = 11.99$, $p < .001$, $\eta_p^2 = .20$. An analysis of simple main effects of *Title* on *Phase* revealed that the factor *Title* was significant for P2, $F(2,46) = 20.58$, $p < .001$, $\eta_p^2 = .47$, but not for P1, $F(2,46) < 1$, *n.s.*[1] This interaction is illustrated in Fig. 2. Ratings of understanding were significantly higher for elaborative than descriptive titles ($p < .01$) and higher than in the no-title condition ($p < .001$). Ratings on descriptive titles were significantly higher than ratings on no-title ($p < .05$).

[1] Note that it is an important pre-condition that pictures used in P1 that were matched to the paintings of the same painters for *Title* conditions *elaborative*, *descriptive* and *no-title*, were expected *not* to differ in any scales as the treatment (here: *Title*) is not yet given. Exactly this criterion is confirmed here indicated by a non-existing effect of *Title* at P1.

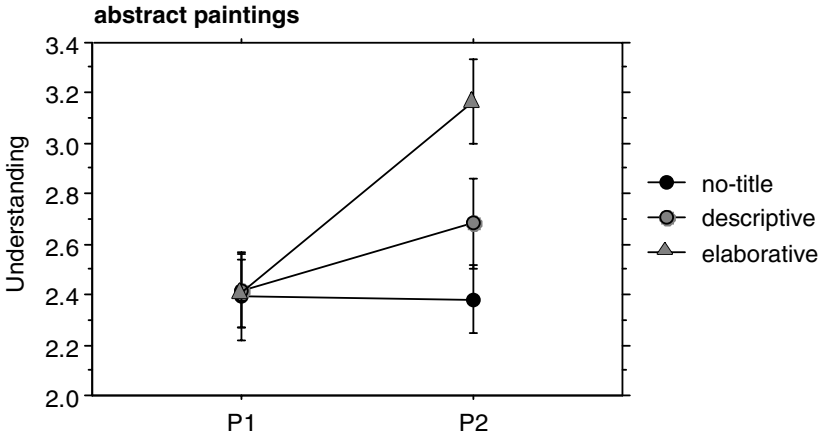

Fig. 2. Interaction between *Phase* (P1 and P2) and *Title* (no-title, descriptive and elaborative) on the mean ratings of the scale *Understanding* (error bars indicate standard errors of the mean).

3.2.3. Influence of interest in art on aesthetic experience

In order to analyze the effect of interest in art and effects of titles and Representativeness, a composite art interest score was computed as a mean score of all nine items on the questionnaire. For the assignment of high and low Art Interest, we computed a median split. Scores of 30 and above [range: 12–57] were assigned to high art interest. In order to test effects of Art Interest, we first conducted a mixed-design MANOVA with all six scales. As between-subjects factor *Art Interest* was used and as within-subjects factors *Phase*, *Representativeness* and *Title* were used. There was a main effect of *Art Interest*, $F(6,41) = 2.34$, $p < .05$, $\eta_p^2 = .26$, but no interaction of *Art Interest* with any other variable. As *Art Interest* was found significant in the multivariate analysis, we further conducted six independent mixed-design ANOVAs for every scale. As before, we used *Art Interest* as between-subjects factor and *Phase*, *Representativeness* and *Title* as within-subjects factors. Participants with more interest in art showed higher ratings for Understanding, $F(1,46) = 5.75$, $p < .05$, $\eta_p^2 = .11$, Interest, $F(1,46) = 6.05$, $p < .05$, $\eta_p^2 = .12$, Emotions, $F(1,46) = 8.44$, $p < .01$, $\eta_p^2 = .16$, and Thoughts, $F(1,46) = 7.93$, $p < .01$, $\eta_p^2 = .15$. However, there were no interactions between *Art Interest* and any other factor for any scale.

3.3. Discussion

The results of the MANOVA analysis revealed main effects of *Representativeness* and *Title*, and most important a significant interaction between them. Experiment 1 revealed that an elaborative title accompanying an abstract artwork increased its understanding. This finding supports the special need for interpretation of abstract art as assumed by Leder et al. (2004). Interestingly, no significant effects of titles were found on liking. Thus, the presentation of a title per se did not increase the hedonic value of the artworks. Russell (2003) added the artist's name and a description of the painting, which presumably increased the level of elaboration with the painting. However, similar to the effects found

by Cupchik et al. (1994) descriptive titles in our Experiment 1 decreased affective and cognitive evaluations. The titles presumably somehow might have reduced the aesthetic meaning of the artworks and made them less interesting. In accordance with the stage model of cognitive processing, further processing concerning the contents or the meaning of the artworks was probably disrupted when a trivial content was recognized (Leder et al., 2004). The finding, that the artworks shown with descriptive titles did not elicit further thoughts, supports this argument.

The participants interested in art understood the representational paintings better and also assigned a higher personal meaning to them. They also showed higher ratings on affective scales. However, the differences in art interest found in our participants were rather small because we mainly tested art novices.

In Experiment 2, we were interested in the nature of the elaboration effect on the understanding of abstract paintings. Because only abstract paintings revealed effects of titling condition in Experiment 1, only these paintings were used in Experiment 2. The main question concerned the effect of titling, when presentation time was restricted.

4. Experiment 2

Experiment 2 was designed as a two-group experiment to investigate time effects of elaboration. In Experiment 2a, abstract paintings with descriptive and elaborative titles were presented for 1 s; in Experiment 2b, the same paintings and titles were presented for 10 s. Participants were asked to rate the paintings on liking and understanding. They were instructed to rate spontaneously and reaction times were measured. Afterwards, questionnaires on art interest, and art knowledge had to be completed.

Different assumptions are possible concerning aesthetic experiences after the short presentation time in Experiment 2a. For the ratings, especially on understanding, a replication of the results from Experiment 1 would assume higher ratings for elaborative than for descriptive titles. Due to the short presentation time, it also seems likely that this might not be the case, because elaboration and understanding presumably require more time. Moreover, we expected a difference in the speed at which ratings were given. According to the model of Leder et al. (2004), perceivers can continuously access their affective processing during the time course of aesthetic experience. Understanding, however, is a process requiring a deep level of processing and therefore presumably takes more time than 1 s. Thus, we expected ratings concerning the liking of a painting to be given faster than ratings for understanding.

Other studies which investigated processes of similarity judgments (e.g., Cupchik & Gebotys, 1988; Hess & Wallsten, 1987) indicate that an increase of presentation time up to 10 s should enable sufficient information processing for an interplay between title and judgment in terms of understanding.

4.1. Method

4.1.1. Participants

Participants were 48 students of the Freie Universität Berlin who were randomly assigned to one of two groups for both experimental conditions (Experiments 2a and

2b). Both groups consisted of students from the Freie Universität Berlin, 21 of them females (mean age in years; Experiment 2a: 25.8, Experiment 2b: 24.5). In order to assess inter-individual differences, all participants completed a questionnaire consisting of nine questions about art interest and a questionnaire about art knowledge.

4.1.2. Materials

Twenty-four abstract paintings, two paintings similar in artistic style and content, created by 12 artists, were selected from art books and magazines for the experiment. The paintings, dated between 1945 and 1999, included for example painting pairs by Dorazio and Noland. The paintings were presented consecutively in two sets of 12 paintings, each set consisting of 12 paintings by 12 different artists. Each participant was shown a total of 24 paintings. For each painting pair, two different titles were selected in the consensus amongst three researchers working in the field of empirical aesthetics, as in Experiment 1. Descriptive titles summarized the most important aspects of the scene in a few descriptive words, e.g., ''Strokes of colour'' or ''Frames in Shades of Blue''. The elaborative titles provided a possible interpretation or explanation of the artwork. For example, the paintings by Dorazio were entitled ''Speed of Light'' (see Appendix C for a complete list of all artists and titles). The data of the rating experiment support our assignment of painting pairs, title creations, and title assignments as descriptive and elaborative titles.

4.1.3. Procedure

In Experiment 2, we presented a total of 24 abstract paintings in two consecutive parts. In one part, the participants were asked to rate their liking, in the other part their understanding. The order of the ratings was balanced between participants. The paintings were combined into two groups of six artists, respectively. In order to assign the two title conditions (descriptive, elaborative), artist groups, title conditions, and the order of the two variables (liking, understanding) were assigned to participants using a fully balanced design for title conditions and the two variables. Four different groups of sequences were used, which differed in their titling conditions and sequence of paintings.

Each painting was presented for 1 s (Experiment 2a) or 10 s (Experiment 2b). The ratings were given on a seven-point-scale from 1 (not at all) to 7 (very much). Reaction times (RT) were measured from stimulus offset on. Participants were asked to rate spontaneously after the paintings disappeared. Titles and paintings were presented in a pseudo-randomized order.

The experiment was conducted individually. The paintings (1280×1024 pixels, 85 Hz) were presented by PsyScope 1.2.5 PPC on a Macintosh G4 computer. The distance between the participant and the computer screen (21 in.) was about 0.60 m, resulting in visual angles of the presentations of about 9.5°. Reaction times were measured from stimulus onset on until the participants pressed a target key on the computer keyboard.

At the end of the experiment, the participants were given the same questionnaires about their interest in art and their specific art knowledge as in Experiment 1. The questionnaire about art knowledge referred to famous artists, e.g., Joseph Beuys, Henri Matisse, and Piet Mondrian. First, the participants indicated whether they knew the names of 10 artists,

their nationality, and the style the artists were famous for. In a second part, the participants were shown a list of nine famous paintings and were asked whether they knew the painting, and to name the artist and the artistic style. A median-split of the averaged score of these questionnaires assigned the participants to high and low art knowledge scores. Both versions of the experiment were completed in about 15 (short presentation time) and 25 min (longer presentation time), respectively.

4.2. Results

First, effects of titling conditions on the aesthetic experience (liking and understanding) are reported. For Experiments 2a and 2b, the means of both ratings for all paintings were calculated for both titling conditions (Fig. 3).

The rating data were analyzed by a three-way mixed-design ANOVA with *Title* (descriptive, elaborative) and *Scale* (Liking, Understanding) as within-subjects variables and the *Presentation time* as between-subjects factor. No main effect was found for *Presentation time*, i.e., the ratings of Experiments 2a and 2b did not differ. The results showed a main effect of *Scale*, $F(1,46) = 16.67$, $p < .001$, $\eta_p^2 = .27$ and an interaction between *Presentation time* and *Title*, $F(1,46) = 9.03$, $p < .01$, $\eta_p^2 = .16$. Most interestingly, there was a three-way interaction between *Presentation time*, *Scale* and *Title*, $F(1,46) = 4.34$, $p < .05$, $\eta_p^2 = .09$.

In order to analyze the effects of the three-way interaction in more detail, we conducted separate ANOVAs for Liking and Understanding. The liking ratings were not influenced by the titles for both presentation times, $F(1,23) < 1.72$, *n.s.* However, there was an interaction between *Title* and *Presentation time* on the variable Understanding, $F(1,46) = 10.32$, $p < .001$, $\eta_p^2 = .18$. For a presentation time of 1 s only, paintings

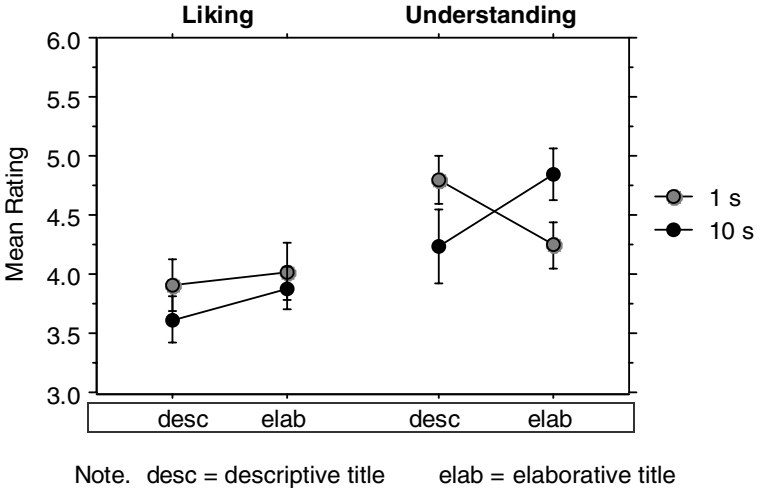

Fig. 3. Mean ratings (and standard errors of the mean) of Liking and Understanding as a function of Presentation time and Title in Experiments 2a and 2b.

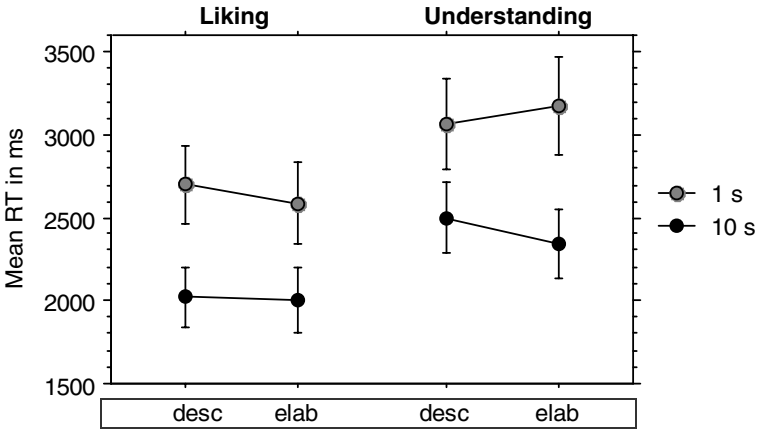

Fig. 4. RTs (and standard errors of the mean) of Liking and Understanding as a function of Presentation time and Title in Experiments 2a and 2b.

presented with descriptive titles ($M = 4.80$, SD = 1.01) were better understood than paintings presented with elaborative titles ($M = 4.24$, SD = 0.93), $F(1,23) = 5.38$, $p < .05$, $\eta_p^2 = .19$. In contrast, given a longer presentation time of 10 s, elaborative titles ($M = 4.24$, SD = 0.93) were better understood than paintings presented with descriptive titles ($M = 4.85$, SD = 1.09), $F(1,23) = 5.02$, $p < .05$, $\eta_p^2 = .18$.

For a comparison between RTs of liking and understanding in both experiments, the RT data were analyzed by a three-way mixed-design ANOVA, with *Scale* (Liking and Understanding), and *Title* (descriptive, elaborative) as within-subjects variables, and *Presentation time* (1 s, 10 s) as between-subjects variable. The distribution analysis of the RTs showed a few values above 8000 ms. All RTs above this value were excluded from further analyses, the resulting range was between 300 ms and 8000 ms. Mean RTs for both presentation times are shown in Fig. 4.

The results showed a significant main effect of *Presentation time*, $F(1,46) = 5.42$, $p < .05$, $\eta_p^2 = .11$ with longer RTs for rating paintings presented for 1 s ($M = 2882$ ms, SD = 1282) than paintings presented for 10 s ($M = 2217$ ms, SD = 979). This is not surprising as participants in the condition of longer presentation times were presumably more readily prepared to react. Therefore, the RTs under short presentation times seem to be more informative as they more validly reveal differences in speed of processes underlying appreciation or understanding. A further main effect was found on *Scale*, $F(1,46) = 11.36$, $p < .01$, $\eta_p^2 = .21$. Taken the RTs of both the experiments together, the mean RTs for liking ($M = 2327$ ms, SD = 1054) were shorter than those for understanding ($M = 2772$ ms, SD = 1207). No interaction effects were significant.

4.2.1. Influence of art interest, and art knowledge

According to their results in the questionnaires about art interest and art knowledge, the participants were divided into two groups by a median split. The ratings and the corresponding RTs for descriptive and elaborative titles were analyzed by separate

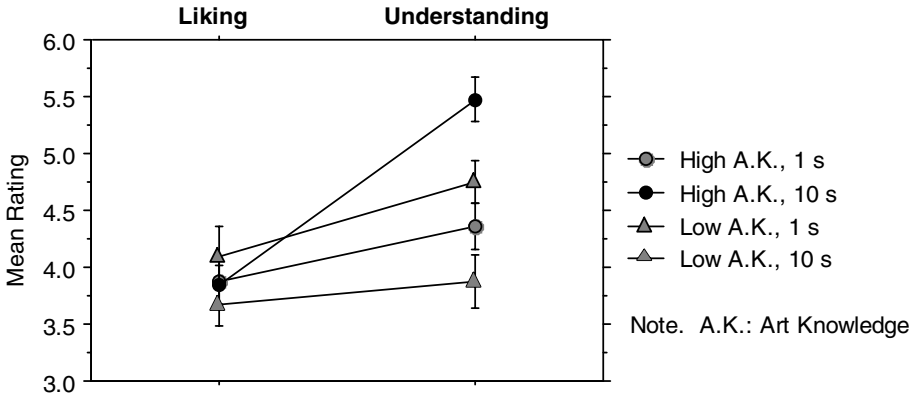

Fig. 5. Mean ratings (and standard errors of the mean) of Liking and Understanding as a function of Presentation time and Art knowledge in Experiments 2a and 2b.

between-subjects ANOVAs for liking and understanding. For the 1 s presentation time condition, art interest and art knowledge did not show significant effects for the ratings or the corresponding RTs. In Experiment 2b (10 s presentation time condition), art interest did not show significant effects for the ratings nor the RTs, but art knowledge did show significant effects for Understanding. Mean ratings of the participants in both presentation time conditions are presented in Fig. 5.

We conducted a four-way repeated measures ANOVA with *Scale* and *Title* as within-subjects variables, and *Presentation time* and *Art knowledge* as between-subjects variables. There was a three-way interaction between *Scale*, *Art knowledge* and *Presentation time*, $F(1,44) = 6.12$, $p < .05$, $\eta_p^2 = .12$. Analyses of simple main effects revealed that participants with higher *Art knowledge* only showed more Understanding if the paintings were presented for 10 s. Art knowledge did not influence the Liking in none of the presentation times.

4.3. Discussion

Similar to the results in Experiment 1 with long presentation times (90 s), titles did not affect the liking of the paintings for short presentation times in Experiment 2a (1 s) and medium presentation times in Experiment 2b (10 s). In contrast, the results for Understanding were affected by the titles. Given a medium long presentation time of 10 s, elaborative titles increased the understanding of a painting quite similar as shown in Experiment 1 with a presentation time of 90 s, whereas descriptive titles resulted in higher values of understanding than elaborative titles when paintings were only shown for 1 s. In the model of aesthetic appreciation (Leder et al., 2004), we assume that the processing of artworks consists of a number of processing stages, which are supposed to be mainly serial. When processing time is restricted then aesthetic judgments have to be based on analyses which only comprise the earlier processing stages. As these include the analyses of "what is depicted" we conclude that, within the short presentation time it was only

possible to accomplish early stages of information processing, including perceptual analyses and identifying the content which in abstract art are closely related (Leder et al., 2004). These results challenge the temporal structure of this model which needs further refinement in the future. This, of course, requires more research concerning the possibility that restrictions in presentation time allow different processes to take place (Kreitler & Kreitler, 1984).

There were no effects of art interest in both experiments, but relative experts seemed to understand the paintings better. This is presumably not only due to the greater experience with artworks but also probably due to a higher level of explicit knowledge. As predicted by Leder et al. (2004), the judgment of liking can be accomplished very quickly, after the perceptual analysis has been completed. However, it seems that at least a medium presentation time of around 10 s is needed for a first interpretation of an artwork that is already sensitive to titles affecting the understanding of an artwork.

5. General discussion

Two experiments investigated the role of titles in the processing of paintings. Experiment 1 revealed that abstract paintings received higher ratings of understanding when accompanied by elaborative titles. Descriptive titles did not improve evaluations. When presentation time was restricted to 1 s in Experiment 2a, descriptive titles improved the understanding more than elaborative titles. Such short presentation times seem to restrict information processing of paintings to representations sensitive to such descriptive information. According to the model of aesthetic appreciation proposed by Leder et al. (2004), which predicts a mainly serial information processing, these findings address the possible time needed to allow different ways of aesthetic processing. Short presentation times allow the access to the explicit classification of content. In accordance with the model this kind of processing is found under short presentation times and it is affected by descriptive titles. In contrast, the full, or at least rather elaborated aesthetic experience consists of later stages of interpretation and understanding which Leder et al. (2004) called ''cognitive mastering''. Elaborative titles presumably affect this later stage of understanding and assignment of meaning. The results of Experiment 2b, using medium long presentation times of 10 s, support this hypothesis. Although the model does not make strict predictions on temporal aspects, the distinction between the two presentation times in Experiment 2 revealed that in accordance with the model, rather descriptive and elaborative titles do differentially affect aesthetic experiences with art. As Bachmann and Vipper (1983) found that many aspects of artworks are available quite fast, at least the findings in the 10 s condition support a more complex interplay of seeing and understanding.

Moreover, judgments concerning the liking of a painting were made faster than judgments concerning the understanding of a painting (particularly at short presentation times in Experiment 2a). This is also in accordance with a time sensitive processing of artworks. Preferences can be made faster because they are presumably based on an affective processing, which is permanently available throughout the processing stages as assumed by Leder et al. (2004). In contrast, understanding, as a cognitive process, requires more time, because it is presumably based on explicit processes of interpretation

and structures of knowledge. However, more systematic variation in presentation time (e.g., Carbon & Leder, 2005) might be promising in future research. Bachmann and Vipper (1983) for example, found that many of the visual properties of art are available after relatively short presentation times. This, however, does not exclude that an understanding in art requires more time. The idea that art requires some time for understanding is also in accordance with the hypothesis that particularly contemporary art offers cognitive and knowledge related challenges which often include an explicit disruption of usually fluent application of skills that are effective in everyday object identification and understanding (Leder, 2001; Reber, Schwarz, & Winkielman, 2004).

Expertise and interest in art showed rather weak effects, presumably because the range of these variables was relatively small due to our sample consisting of art novices. The effects in Experiment 2b need to be studied further. Systematic variation using art experts might be useful for these investigations, particularly as research in the past has shown considerable difference in art processing (Nodine, Locher, & Krupinski, 1993) and appreciations (Cupchik, 1992; Parsons, 1987).

The implications for our understanding of how art is processed are as follows. First, the results reveal that information accompanying art has effects depending on the nature of the information. Descriptive information can help to classify artworks in situations where fast judgments and classifications are required. However, in the more realistic situation in which perceiver perceives paintings for longer, descriptive titles are not helpful, but elaborative information increases the understanding. As artworks in museums are often perceived under time conditions which rather correspond to the 10 s presentation time as in Experiment 2b (Smith & Smith, 2001), we conclude that understanding usually depends on interpretations that take more time. This was also suggested by the temporal structure of the model of aesthetic experience (Leder et al., 2004). Consequently in museums accompanying information should consider the possibility that understanding could be increased by carefully selected, understandable information which goes beyond mere descriptions. Concerning the nature of aesthetic experience we believe that the combination of different dependent variables, as used in the present study, covers the main dimensions of the aesthetic process. However, in future research, the application of a combination of psycho-physiological, neuropsychological and eye tracking measures might also be promising.

To summarize, we have shown that accomplishing titles plays a role in the processing of artworks in that they support the assignment of content or meaning, depending on temporal constraints, particularly in abstract art.

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Appendix A. List of artists, paintings, and titles used in Experiment 1

Artists	Year	Original title	Descriptive title	Elaborative title
Representational artworks				
Amiet, Cuno	1921 1908	Winterlandschaft Winterlandschaft	Houses in snow	Hibernation
Breyer, Benno	1927 1930	Park Schloss Grunenfeld Bauernhof mit Dünen auf der Insel Amrum	Houses surrounded by trees	Insights
Cézanne, Paul	1900 1904	Mont Saint Victoire Mont Saint Victoire	Mountain	Different proportions
Corinth, Lovis	1922 1923	Ostern am Walchensee Walchensee mit Springbrunnen	Lakeside view	Midsummeridyll
Delaunay, Robert	1910/11 1911	Eiffelturm Marsfeld, der rote Turm	Eiffeltower	Breaking into the technical era
Derain, André	1927 1925	Landscape Southern France Paysage du midi	Southern Scenery	Paralyzing midday heat
Feininger, Lyonel	1924 1925	Gaberndorf II Torturm II	Building	Escape routes
Jawlensky, Alexej	1910 1910b	Gebirgsdorf Das Oy-Tal bei Oberstdorf	Mountain landscape	Flaming mountains
Kokoschka, Oskar	1934/35 1936	Prag von der Kramer-Villa gesehen Prag. Blick von Moldauufer ...	View of a town	Timeless
Modersohn-Becker, Paula	1899 1902	Sandkuhle am Weyerberg Garben, Haus und Mond	Pastoral landscape	Autumn mood

(*continued on next page*)

Appendix A (*continued*)

Artists	Year	Original title	Descriptive title	Elaborative title
Slevogt, Max	1923 1923b	Winterlandschaft—Neukastel Winterlandschaft—Schneeschmelze	House on slope	Longing
Vlaminck de, Maurice	1908–10 1905	Der Schleppzug Peniche huile sur toile	Ship	Impetus
Abstract artworks				
Hartung, Hans	1989 1989	Untitled L50	Composition in yellow, green and violet	Part of a firework
Kirkeby, Per	1989 1991	Blick in den Garten I Skowhegan I	Dark zigzag lines on subdued background	Water reflection
Klein, Yves	1961 1961	Untitled fire-painting Untitled fire-colour-painting	Running colour in light and dark	Tears
Kline, Franz	1957 1953	Untitled New York, N.Y.	Wide black beams	Loading capacity
Kooning de, Willem	1988 1984	Untitled Untitled XVII	Coloured wavy lines on light ground	Exuberant atmosphere

Pollock, Jackson	1946 1947	Eyes in the Heat Full Fathom Five	Fine curved lines in colour	Impulsiveness
Rae, Fiona	1994 1994	Untitled Untitled	Colour patterns	Implosion
Reichert, Hubertus	1987 1988	Untitled Bldv. IV	Square in the right half of the picture	Look inside
Richter, Gerhard	1984 1982	Ingrid Eule	Coloured areas	Revolution
Rothko, Mark	1954 1951	Untitled Number 7	Coloured fields	Inner balance
Schuhmacher, Emil	1983 1983	Dunkle Wolke Fluß	Dark coloured cloud in diagonal direction	Enclosed plot
Velde van, Bram	1936–41 1945–58	Untitled Untitled	Contrasting coloured elements	Harmony in contrast

Appendix B. Nine items presented in the questionnaire on art interest

I am interested in art
I am involved in art during my leisure time
I often visit art exhibitions
I enjoyed attending art classes at school
I visit events on art or art history in my leisure time or because of my studies
I always seek new artful impressions and experiences
I enjoy talking to other people about art
I enjoy reading articles written by artists or about art in general
It often happens in my everyday life, that art objects attract my attention and fascinate me

Appendix C. List of artists, paintings, and titles used in Experiments 2a and 2b

Artists	Year	Original title	Descriptive title	Elaborative title
Abstract artworks				
Abad, Pacita	1997	Feeling something inside	Colourful ornaments	Wanderlust
	1998	It's time to pop the champagne		
Bazaine, Jean	1949	L'arbre au plongeur	Dense play of colours	Flush of senses
	1982/3	Variations II		
Dachlan, Umi	1998	Red Brown	Surface of red and brown	Constructions of clay
	1999	Komposisi dari Nuansa Coklat Terang dengan Uang Logam dan Emas		
Dorazio, Piero	1960	Qualités jaunes	Strokes of colour	Speed of light
	1962	Marmaraviglia		
Halley, Peter	1989	Out Like a Light	Coloured surface	Destillery
	1990	Character Generator		
Lasker, Jonathan	1990	Rustic Psyche	Curved lines	Sabotage
	1988	The Big Picture		
Marden, Brice	1988/9	Couplet IV	Net of colours	Tangle of voices
	1987	6 (Course)		
Nay, Ernst Wilhelm	1957	Untitled	Colours and forms	Hide-and-seek
	1948	Der Hirte II		

Appendix C (*continued*)

Artists	Year	Original title	Descriptive title	Elaborative title
Noland, Kenneth	1960	Bloom	Frames in Shades of Blue	Journey of time
	1983	Cornet		
Riopelle, Jean-Paul	1951/2	Sans titre	Dots of colour	Ice dancing
	1954	Peinture		
Scully, Sean	1999	Four Large Mirrors (3)	Stripes in light and dark	Disagreement
	1993	Colonsay		
Steir, Pat	1990	Red Blue Silver Waterfall	Colour gradient	Rainforest
	1989	Secret Night Waterfall		

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