

Mastering style – Effects of explicit style-related information, art knowledge and affective state on appreciation of abstract paintings

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Abstract

Recently, Leder, Belke, Oeberst, and Augustin (2004) have proposed a model of aesthetic experience in which stylistic processing is central for aesthetic experiences of art. Here we present an empirical study which investigates predictions derived from the model. Using modern and contemporary abstract paintings we investigated how their appreciation is affected by style information generalized onto new exemplars of paintings by the same artists. In accordance with the model's predictions, effects of style processing depend on the affective states of the viewers as well as their ability for cognitive mastery, measured by amount of expertise. The experiment reveals that the examination of style-related cognitive processes is important to psychologically understand the affective, cognitive and presumably self-rewarding aspects of aesthetic experiences.

Key words: art perception, model of aesthetic experience, art expertise, mood

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Art is found in all human cultures. Although not apparently functional in terms of biological adaptation on the first sight the production and reception of art must have some features which produce positive and rewarding experiences and which therefore explain its ubiquity. In order to understand which specific mechanisms are involved in the aesthetic appreciation of art, we have recently proposed a cognitive processing model of aesthetic experiences (Leder, Belke, Oeberst, & Augustin, 2004). The model describes five processing stages that are involved in an aesthetic processing experience (Perceptual Analyses, Implicit Memory Integration, Explicit Classification, Cognitive Mastering and Evaluation). Moreover the role of influencing variables such as art experience and expertise as well as initial affective state were discussed.

The earliest stages of information processing (of visual arts) are concerned with perceptual analysis of the canvas. At this stage variables of interest include for example complexity, contrast and grouping, for which a majority of contributions of empirical aesthetics are concerned with. In the stage of implicit processing the results of the perceptual analyses are set in relation to analyses that result directly from previous experience. Most important prototypicality and familiarity contribute to processing at this stage. The processing stage called Explicit Classification provides explicit representations of either depictive content or explicit style information of the artwork. Which of the two aspects becomes more central depends on and a) the amount of beholders's art expertise b) the nature of the artwork. For art-experienced viewers a type of style-related processing seems to be representative while for art naïve persons a content-related processing is rather typical (Cupchik & Laszlo, 1992). This distinction refers to search of meaning in visual art and proposes that with increasing art experience the focus on "what is depicted" shifts towards the aspect on "how it is depicted". Thus, art expertise and art experience might moderate processing at this stage. In the case of abstract art, style is believed to generally take on the role of content.

The processing stages just described are followed by cognitive evaluations, consisting of self-related and art-specific analyses, which are triggered and processed in feedback loops until a satisfactory "aesthetic concept" about the aesthetic object is generated. The evaluation phase may lead to further information processing if the state of understanding is unsatisfying or too ambiguous (Cupchik, 1992).

Central to the model is the assumption that subjective "success" in processing art (during the five processing-stages) is thought to be self-rewarding, raises aesthetic pleasure and might also increase aesthetic evaluation. For example, the experience to dissolve perceptual or conceptual ambiguity is assumed to influence the continuous affective evaluation of an artwork positively and can also result in an increase in appreciation of the artwork. Thus, we suggest that people continuously use their affective reactions as a source for evaluating the artwork. This idea bears similarity to the concept of Processing Fluency, which was recently proposed by Reber, Schwarz and Winkielman (2004). In their approach, emotional reactions are elicited during processing of an artwork and result in a more favourable evaluation the more the processing of the artwork was experienced as positive. They suggest that the more "fluid" the processing of an artwork is, the more positive the aesthetic response. According to Reber et al. high Processing Fluency is associated "with progress toward successful recognition of the stimulus, error-free processing, or the availability of appropriate knowledge

structures to interpret the stimulus” (2004, page 366). However, in respect to the model of Leder et al (2004), the impact of such hedonic-fluency effects on aesthetic judgments presumably depends on the degree of art expertise. For example, art experts might separate initial affective reactions elicited during an aesthetic episode and tend to evaluate more cognitive-based.

At the outcome of the evaluation phase a beholder comes to an aesthetic judgement and has an aesthetic emotion, distinguished in the model as two processing outputs. The distinction between a more cognitively based evaluation (aesthetic judgment) and emotional pleasure (aesthetic emotion) derived from the art-experience has received much attention in philosophy of art and partly in empirical aesthetics (see Allesch, 1987, for an overview, or Kreitler & Kreitler, 1972). Moreover, Leder, Augustin & Belke (2004) discussed, which kind of behavioural measures (e.g. judgments of preference, liking and beauty) typically assessed in experimental settings could be related to these processing outputs.

In the present study we focused on effects of style-related explicit information on ratings of liking of visual art. To increase the reliance on style only abstract paintings were used. According to the model stylistic processing is considered to be a central process in visual art experiences. Its importance is derived from a qualitative analysis of modern art (Leder, 2002). It is particularly modern art that has some specific features that need special emphasis in theories of empirical aesthetics. First, through the upcoming of abstract art (since around 1910) perceivers are exposed to artworks that per definition have no depictive content. Moreover, the need for individualization in the twentieth century results on a huge competition of artistic styles and concepts. The latter means that often artworks transport ideas rather than representational content. Consequently, abstract paintings require a particular need for interpretation. As visually based classification of objects in terms of object identification is excluded per definition, pure abstract artworks pose a particular challenge to cognitive mastering. They provide material, which needs interpretation in terms of style, which comprises structural, formal and technical features of visual appearance. Hartley and Homa (1981) stated, “despite the differences in definition, we are all aware of styles as the perceived global impressions we retain after encountering various instances of an artist’s artwork” (Page 33). According to Leder (2002) style can be understood as an art-specific representation of visual information that distinguishes amongst different artists.

Style-related processing is assumed to comprise *implicit* processing, such as concept learning, that takes place naturally and automatically when viewing a set of related stimuli (Gordon & Holyoak, 1993; Hartley & Homa, 1981; Reber, 1967). Thus, the learning of style-related representations such as prototypes or stylistic concepts is considered to be rather automatic. Moreover, Gordon and Holyoak (1983) assumed that once a “rule or style” underlying a set of stimuli is learned, the generalisation of style is an important feature of implicit aesthetic processing. They found empirical support, suggesting that the ability to relate stimuli to a learned structure leads to preference, and they thus assume that generalization might be a pleasing experience in itself. In order to address such a process of implicit style-generalization in the present study, we used different artist’s exemplars of the same style between learn and test-phase of the experiment. Moreover, it can be assumed that style-related processing involves *explicit* information-processing, such as classification of styles according to single artists, schools or other semantic classes by knowledge that is gathered through art education (Parsons, 1987). It is assumed that style-related processing involves

explicit processing stages, as its outcomes often can be verbalized. Moreover, without explicit learning about art styles, artworks are difficult to classify (Hartley & Homa, 1981).

In the study, participants received extra style-related information to foster stylistic processing for some artist's styles. The main research question is concerned with the effect of such explicit style information on the appreciation of paintings of the same artists, and how it is mediated. We expected explicit information about style to increase appreciation, presumably because it improves comprehension and the ability to successfully master an abstract artwork. This kind of information was assumed to enhance processing of described features and facilitates the generation of style specific schemata. According to the model this might result in an increase of aesthetic appreciation for artworks, which have been accompanied by such information due to rewarding effects of enhanced explicit recognition and implicit style processing and generalization. Previous research suggests that context information about artworks might affect the degree to which the artwork is elaborated, particularly, when information triggers alternative concepts to what can be readily inferred from the artwork (Millis, 2001). As a result of such elaboration some authors found increases in aesthetic appreciation or aesthetic emotional experience (Russel, 2003).

However, effects of explicit style information on liking presumably depend on the amount and nature of a participant's art-related knowledge. Empirical evidence for the significance of art-knowledge was revealed by Cela-Conde (2002). People with education in art-history had greater skills to discriminate amongst abstract art than persons without prior art education, which was explained by the generation of style-specific schemes, that allowed for a better "semantic comprehension" of the abstract paintings. Due to findings that descriptive information added to artworks sometimes produced negative effects on aesthetic judgments (Cupchik, Shereck & Spiegel, 1994; Leder, Carbon & Ripsas, 2006), we propose that the level of art-knowledge is critical. People educated in the visual arts might already have a kind of style-specific knowledge and art-related processing routines (Cupchik & Laszlo, 1992). In contrast, rather naïve persons are expected to particularly profit from stylistic information. Thus positive shifts in aesthetic appreciation are expected particularly for the latter group of perceivers. For relative experts the stylistic information might even lower appreciation as a result of constraining conceptual analyses or resulting from an interference with knowledge they used to apply. Therefore, effects of stylistic information might vary with the degree of art education.

In the study we used different means of measuring expertise and art knowledge. We combined measures of interest and knowledge to get a broad index of art expertise. Art-knowledge was assessed as the amount of pictorial and declarative knowledge a person has about established artists and art-schools. Using scales that assessed interest, e.g. how often a person visits art galleries, we got an index of the intrinsic motivation of a viewer to expose him to art (see Leder et al., 2004). This measure seemed important, because especially modern art requires the perceiver to invest great effort to extract meaning due to a high level of semantic ambiguity (Leder, 2002).

According to the model we also predict that aesthetic appreciation depends on the initial affective state of the perceiver. Consequently, we measured the affective state of the participants during the test-phase. Forgas (1995a) showed that the emotional state of a judge is likely to influence evaluation of stimuli that require demanding and constructive processing. The Affect Infusion Model (Forgas, 1995b) explains that affect influences on evaluative judgments increase, the more substantial and constructive the processing of a stimulus is.

Empirically, mood research has consistently found a positive correlation between processing demands and affect influences on judgments. Therefore, we expected affect influences to occur in the evaluation of abstract paintings, as these objects clearly are atypical and ambiguous and are expected to require a constructive type of processing. One possible explanation for mood-consistent evaluation effects is the affect-priming-principle (Bower, 1981), according to which mood-congruent memory associations are activated and further top-down processing of a stimulus is indirectly influenced. However, empirical testing of this hypothesis with artworks has not been reported so far.

Another consideration that makes assessment of the viewer's emotional state reasonable is that the typical emotional state when exposing oneself to art in a natural context, a museum or art gallery, is rather positive (Leder et al., 2004). Thus, positive aesthetic experiences are assumed to rely on an initially positive affect and it is proposed that a positive affective state indicates a state of openness. A negative emotional state, on the other hand, makes it unlikely to enhance aesthetic evaluations, especially in a laboratory setting. Thus, the control of affect generally improves the ecological validity of the study.

Moreover, we included a measure of cognitive load to investigate whether style-related information affected the degree to which the artworks were elaborated. This measure was considered as a treatment check. Explicit information added to the perception of paintings should enhance mental representations, and thus increase elaboration of the artworks. We tested degrees of elaboration by assessing the cognitive load during processing the artwork via a Subjective Time Estimation method. As there is no direct measure for the cognitive load of a person, the estimation of presentation times offers a promising approach (Fink & Neubauer, 2001). According to an attentional model of time perception (first proposed by Thomas & Weaver, 1975), attentional resources between temporal and non-temporal processing are limited. The influence of concurrent information processing on Subjective Time Estimates has been investigated in a number of studies and it has consistently been found that the estimated duration decreases as a result of increasing concurrent non-temporal processing demands (Fink & Neubauer, 2001). Thus, the attentional model predicts a negative correlation between cognitive load allocated for non-temporal tasks and subjective time duration. Therefore, concerning the Subjective Time Estimates we expected conditions in which style processing is enhanced compared to baseline-processing to result in a stronger underestimation of presentation times of paintings, indicating a higher cognitive load or elaboration.

To summarize the key assumptions and empirical hypotheses:

- 1) In the above-described model of aesthetic experience style-related processing is considered to be essential in the domain of modern, especially abstract art. In the study we measured how ratings of liking changed selectively for paintings when explicit style information was instructed for similar exemplars of the same artists. Providing the viewer with explicit information should enhance style-related processing and allow for self-rewarding experiences of successfully mastering the artwork. As a result, aesthetic appreciation should increase selectively for the works of artists presented with additional information.
- 2) Effects of style-related processing on liking were assumed to depend on two intervening differential variables: art expertise and affective state. As cognitive mastery in the art-model depends on the level of art expertise of the perceiver, an expertise index was revealed for each participant and employed in the analyses. Moreover, positive aesthetic

experiences are also predicted to rely on the initial affective state in that positive aesthetic experiences might be more likely in a state of openness. Thus, we assumed that the initial affective state as well as art expertise moderate effects of style-related processing on changes in liking.

- 3) To implement a treatment check, we tested whether style related information affected processing demands of the participants. Therefore a measure of cognitive load was included, by using a Subjective Time Estimate task. If explicit style-related information influences the degree to which the artworks are elaborated, we expected shorter Subjective Time Estimates (due to higher level of cognitive load) when people process new exemplars of the same artists in the treatment condition.

Method

Participants. 60 undergraduate Psychology students of the Freie Universität Berlin (40 females, 10 males) took part for course credit. The mean age of the sample was 25.01 years ($SD = 6.39$).

Materials. Stimulus material consisted of 36 abstract paintings by 12 modern and contemporary artists, three artworks of each painter. Three similar works of each of the painters were used. At the same time, individual styles of the different artists were selected to be easily distinguishable from each other, providing a fairly broad range of modern painting styles in abstract art. Paintings by the following artists were used: Hans Hartung, Per Kirkeby, Yves Klein, Franz Kline, Willem DeKooning, Jackson Pollock, Fiona Rae, Hubertus Reichert, Gerhard Richter, Mark Rothko, Emil Schumacher and Bram Van Velde. All paintings were scanned and transformed into full colour digital versions. During the experiment the artworks were shown on a 21" screen. The 36 paintings were divided into 3 sets of 12 artworks, each containing one of the three artworks of each painter. Paintings were randomly assigned to the three sets.

Each of the three sets of paintings was randomly divided into two subsets, A and B, which received stylistic information or served as controls, vice versa. Subset A contained works of Hartung, Kooning, Pollock, Rae, Reichert and Schumacher, while the paintings of Kirkeby, Klein, Kline, Richter, Rothko and Van Velde constituted subset B.

The main experimental manipulation in the study consisted of style-related information. The participants were given written information about stylistic features of either the paintings of subset A or B. The information was presented as short texts, each of which appeared on the screen beside the respective picture. Stylistic information comprised descriptions of artistic technique, of stylistic features and of materials used. Great care was given to include distinctive features of each artist's style into the texts, often by referring to the tools or main compositional elements used to make the artworks. For example, Hans Hartung put colour to the canvas by using spray guns, the paintings by Yves Klein used here were burned signs on canvas, and Gerhard Richter's paintings were produced with large scrapers. It was also ensured that the described elements would be recognizable from the reproductions. It was tried to keep the texts free of any evaluative statements (such as..." is one of the outstanding artists of the 20th century"). Appendix A contains examples of half the texts.

Procedure and design. The Experiment consisted of a number of blocks which served to balance conditions and reveal base-line values for the different measures. Most important

was the variation of treatment given to half of the paintings (within-participants). In the next sections the measurements and dependent variables are described. Afterwards, the different phases of the two sessions are described in their temporal order.

The design used in the experiment was a mixed within- and between-participants design. The effects of stylistic information were tested within participants by comparing changes in liking judgments between the subset of styles shown with and those shown without information. We decided to investigate effects of explicit information in a within-subjects design, because Russell (2003) reported that effects of semantic information about artworks on cognitive and emotional rating scales could only be found in a within-subjects design but not in a between-subjects design, due to a lower (test-) sensitivity for the expected effects. The experiment consisted of two sessions, which were conducted on two subsequent days. The first session took about 30 to 40 minutes, the second about 45 minutes. Participants were tested individually. All experiments were conducted in a laboratory at the Department of Psychology of the Freie Universität Berlin.

First Session. At the beginning all participants were told that the experiment examined the perception of modern and contemporary painting. This is important as it somehow assures that aesthetic experiences could occur (Leder et al., 2004). The experiment was programmed using PsyScope (Cohen, MacWhinney, Flatt, & Provost, 1993). All instructions were – if not stated differently in the following – presented to the participants on the computer screen. During the different phases of the first day there was always used the same set of paintings. The order in which the three sets of paintings were presented was balanced between participants according to the Latin Square (orders 1-2-3, 2-3-1, 3-1-2). Furthermore, the fact whether information was presented with subset A or B was fully balanced between participants, too. Thus, there were 6 basic conditions.

Free Exploration. After reading a standardized welcoming text, participants saw a poster, on which all the paintings that they were going to see that day were printed in small format. Participants were asked to take a glance at these pictures in order to gain an overview of the artworks they were going to deal within the running session. Afterwards the person saw all of those pictures again, which appeared in random order on the screen. The participants were asked to look at each painting as long as they wanted to, switching to the next picture by pressing the space key. Exploration time for each painting was measured and recorded by the experimental program but not further analyzed.

Base-rate for liking. After the initial familiarization the participants received all twelve paintings as small-format paper versions and were asked to place these pictures on a twelve-point scale, which lay as a poster in front of them. The instruction read as follows: "Your task is to sort the paintings you've just seen according to how much you like them. Please place all twelve pictures on a scale of twelve ranks. Choose rank no 1 for pictures you like very much, no 12 for pictures you do not like at all. Please notice that the order does not have to start with rank no. 1. It is possible to skip ranks as well as to place pictures in the same rank if you like them equally well..." This measurement warrants analyzing the resulting data at interval-level. No time limit was given at this stage. The experimenter wrote down the participants' choices in a form that had been specially designed for this purpose.

Selective treatment. Great care was taken to ensure that both kinds of paintings - those with treatment and those in the control condition - were explored approximately for the same time and both intensively. We developed two tasks. In the control conditions, the participants were first presented six paintings of the subset without treatment. They were asked to choose

whether they preferred screen or paper as the mode of presentation. This was explained to be important for applied reasons of publishing reproductions of artworks in books or in electronic media. The pictures were presented in random order, each for 60 seconds, and both on a computer screen and as a printout on a card. Answers to this task were recorded but not analyzed further. Afterwards, the actual treatment-phase started, covered with a different story. The participant's task during this phase was to judge whether the features described in the text could be recognized more easily on the paper or the screen version. The paintings appeared on the screen for 60 sec each, together with the style information. In analogy to the predecessor phase a paper version of each painting was handed out to the participant. The idea of this task was to ensure an elaborative processing of the information as well as the encoding of the provided information together with the respective style. The treatment block always started with the control paintings, because otherwise it could not have been excluded that the participants might transfer some aspects of style information onto the control paintings, too.

Second session. During the second day of the experiment, the participants saw new pictures of the same artists, which were the paintings of the remaining two sets that had not been used the day before.

Assessment of mood and free exploration. After welcoming, the participants were asked to fill in the mood questionnaire "Positive and Negative Affect Schedule" (PANAS) (Krohne, Egloff, Kohlmann & Tausch, 1996). Subsequently, this phase was analogous to the free exploration phase during the first experimental session, apart from the fact that a different set of paintings was used. Participants were told that they would see 12 new paintings of the painters whose works they had already seen day before.

Changes in Judgments of liking. This phase was analogous to the evaluation phase on the first day of the experiment. Judgments of liking were measured in the same way as on the day before, in terms of a ranking of all twelve paintings. After having finished this task, participants were asked to fill in the PANAS for the second time. Two scale versions were used, which differed only in the order in which the items were presented.

Subjective time estimates. In order to include a direct measurement of processing differences between paintings in the treatment and control condition, we included a time-reproduction task. Subjective time estimates (STE) were analysed within a prospective time reproduction paradigm, which means that participants were informed in advance that time intervals would be estimated, and estimates were assessed through physical reproduction of each time interval. This procedure ensured the most reliable assessment of subjective time experience (Dutke, 1998). Twelve new paintings of the same artists appeared in two duration conditions (5 sec and 10 sec) in random order. The participants' task was to reproduce the duration for which each painting appeared on the monitor: Whenever a painting disappeared from the screen, an acoustic signal indicated that the person was to wait as long as she thought the picture had been presented before, and to end the reproduction interval by pressing a key. In the instruction it was stressed that it was important not to calculate the presentation time, but to watch the paintings in a relaxed and attentive way. It was also explained that this block intended to measure how long the presentation times were experienced subjectively. The reproduced time intervals were measured and recorded automatically.

Post interviews. The second session ended with a phase in which participants were requested to fill in the expertise questionnaire (on interest and knowledge in modern and contemporary painting).

Dependent variables. Changes in liking were measured as the difference between the second and the first measure. Such changes were compared within participants between the subset in the treatment and that in the control condition. The second dependent variable “changes in affective state” was measured only in the test phase (on day two) as differences between the two measures.

Mood/ affective state. The participants’ mood was assessed using the Positive and Negative Affect Schedule (PANAS) by Watson et al. (1988), which was applied in the German adaptation by Krohne and Tausch (1996). The questionnaire assesses two affective dimensions, called Positive Affect (PA) and Negative Affect (NA), which indicate the subject’s current affective state. According to Watson and Tellegen (1985) the two dimensions PA and NA are independent and bundle a multitude of affects. While PA describes the extent to which a person is enthusiastic, active and attentive, NA can be characterized by lethargy and sadness. For each of the items the person can choose on a five point-scale (ranging from “not at all” to “extremely”) to which extent she agrees with the item. In the present study the respective instruction read: “How do you feel in this very moment?” This measure of mood was used as an independent quasi-experimental variable to test the prediction, derived from the model, that effects of aesthetic experience are found (to a stronger extent), when people are in a positive mood.

Expertise and interest in art. To get an index of expertise in terms of art-specific knowledge and interest, the participants were asked to fill in a number of questionnaires. A measure of interest contained four items such as how often participants visit exhibitions or how much they enjoyed art lessons in school (see Appendix C for the complete list). Art-related knowledge was measured by a questionnaire of two parts. In the first part the participants were given the names of ten artists and they were asked to indicate whether they knew the artist, to give the artists nationality, and to provide a stylistic label for the style that the respective artists’ works are normally linked with. In the second part the participants saw reproductions of nine paintings of modern art and were asked the same questions about the artworks (see Appendix D for the complete list of artists names and paintings). Apart from some of the items assessing interest in art, the questionnaire has already been applied in other experiments in the realm of aesthetics at the FU Berlin. The tests of validity of the instrument on the basis of these data are not finished yet. However, as far as can be said on the basis of the existing data, they reveal reasonable variation on both variables. Each participant’s z-standardized sum scores on the scales of interest and knowledge were combined (added) to generate a general index of art expertise.

Subjective time estimates. Presentation times in the five and ten sec condition were analysed as the difference between absolute (correct) presentation times and estimated time intervals.

Results and discussion

Changes in ratings of liking for the abstract paintings due to stylistic information were of most interest. As the first experimental session revealed base-line values for liking, we investigated whether the processing of style-related information induced changes in the subjects’ ratings from the first to the second session, using similar paintings of the same artists. Such changes were established for each participant for the subset of paintings in the treatment and

the control condition by subtracting liking-scores of the second session from those of the first session.

We further analysed influences of style-related information as related to the participants' level of art expertise and their initial affective state. Participants were therefore divided post-hoc by median split into groups according to their score in the questionnaires. This allowed a quasi-experimental investigation independently of the factors art expertise and the initial affective state. No correlation between the two factors affective state and art expertise was found, indicating a linear independence. Results of the time reproduction task, as an indicator of cognitive load, are reported at the end of this section.

Effects of Treatment and Art Expertise. Explicit style information did not induce higher ratings of liking in the second session in general: No main effect of CONDITION (treatment versus control) on changes of liking was found, $M_{diff} = .53$, $t(59) < 1$. This lack of a main treatment-effect is in accordance with the finding reported by Millis (2001) that descriptive titles did not enhance aesthetic experiences in general. However, as predicted by the hypotheses, a quasi-experimental split of the participants by median (according to their overall expertise scores) revealed that effects of stylistic information depended on art expertise: Figure 1 shows mean changes in liking in the treatment and control condition, sampled for the groups of high and low expertise. Means were analysed in a mixed two-way ANOVA

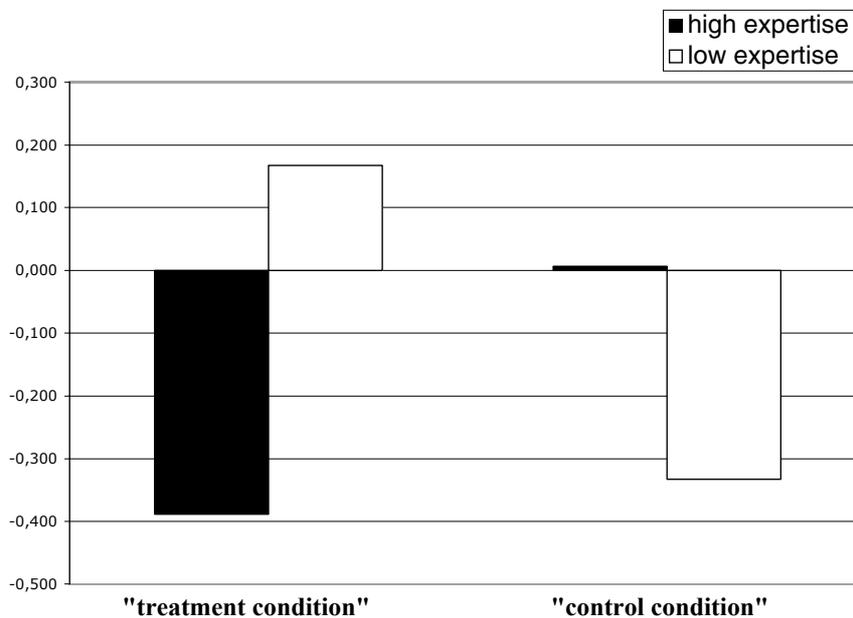


Figure 1:
Effects of style-related information depending on art expertise conditions. Mean changes in ratings of liking (in ranks per picture) between second and first phase for groups of low and high art expertise are shown. Positive values indicate increase in liking from the first to the second phase.

with repeated measurement for CONDITION (treatment versus control) as within-subjects factor and EXPERTISE (high versus low) as between-subjects factor. The analysis revealed an interaction between the two factors, $F(2,58) = 4.04$, $p < .05$. In the treatment condition ratings of liking increased within the group of low expertise ($M = .17$, $SD = 1.36$) in contrast to the group of high expertise, whose mean ratings of liking decreased after having received the treatment ($M = -.39$, $SD = 1.08$), $t(58) = -1.74$, $p = .0832$, *n.s.* Post-hoc tests indicated that within-subjects changes in liking for groups of high and low expertise were not significant.

Figure 2 shows the extent of changes in Liking as a result of the treatment for increasing level of art-expertise. It can be seen, that there is a negative shift in Liking within the group of higher expertise in the treatment condition. The figure also reveals that not all of the high expertise participants showed a decrease due to the treatment.

In Sum, these findings support the prediction that art expertise mediates influences of stylistic information on appreciation of abstract art. Increases in liking in inexperienced viewers are in accordance with the assumption of pleasing and self-rewarding experiences that success in style processing involves. However, the occurrence of decreases in liking elicited by the treatment in more art-educated participants is an intriguing and somewhat surprising result. As art experts presumably have more skills to master an artwork cognitively (in terms of style-related classification and extraction of meaning), descriptive stylistic information might have led to “trivialization” of the artworks. This interpretation is in accordance with Cupchik, Shereck and Spiegel (1994), who found that mere descriptive texts reduced affective and cognitive ratings of artworks from a first to a second exposure. Possibly, the provided descriptions of paintings emphasised more the physical method of production of the image and to a lesser extent the aesthetic effect of the process. This kind of infor-

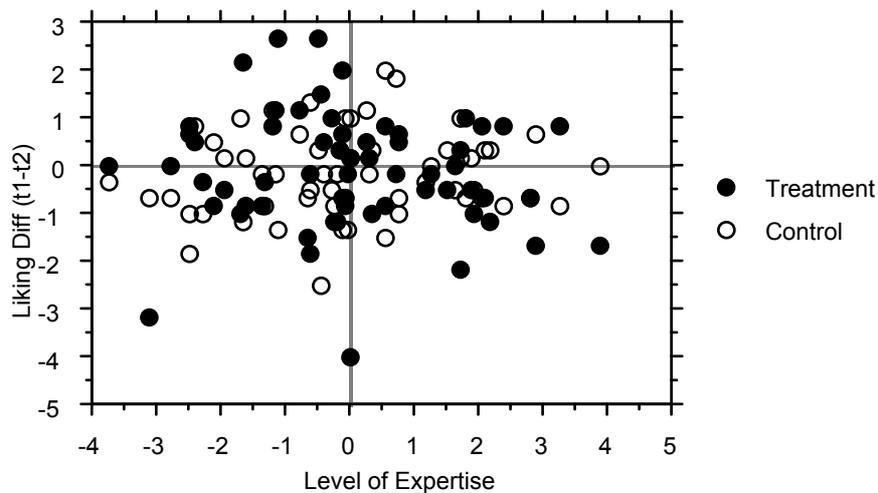


Figure 2:
Scattergram, with expertise level and changes in Liking (t1-t2) in the treatment and control condition.

mation could either have been regarded as trivial per se or simply failed to increase knowledge of participants with higher expertise.

To summarize, the analyses revealed that art expertise is an important mediator in the effect of style-specific processing. For perceivers of relatively low expertise stylistic information had a positive effect on aesthetic evaluations, while for persons with more expertise stylistic information had the opposite effect, presumably due to trivialization of the paintings.

Effects of Treatment and Affective State. Scores of the PANAS scales at the beginning of the second experimental session were used as a quasi-experimental variable. Figure 3 shows means of changes in liking for groups of high and low positive affective state and experimental condition. Since the scores of NA hardly showed any variations, we had to exclude them from the analyses.

A two way repeated measurement ANOVA with POSITIVE AFFECT (low PA versus high PA) and CONDITION (treatment versus control) revealed a main effect of POSITIVE AFFECT $F(2, 54) = 5.54, p < .05$ ³. This main effect was qualified by a significant interaction between CONDITION and POSITIVE AFFECT $F(2, 54) = 4.79, p < .05$. Post-hoc tests revealed that the interaction resulted from a significant difference between means of high and low positive affect groups in the treatment condition, $M_{\text{diff}} = .88, t = 2.74, p < .01$.

Figure 3 shows that explicit style information provoked mood-equivalent changes in liking: The group of high Positive Affect showed increases in liking ($M = .36, SD = 1.45$), whereas the group of low Positive Affect, inversely, showed decreases in liking ($M = -.53, SD = 1.45$). As assumed, gains in liking were actually observed if participants were initially in a positive emotional state. However, post-hoc tests revealed that within-subjects gains in liking (within the group of high Positive Affect) evolved only as a tendency, $M_{\text{diff}} = .60, t = 1.88; p = .071, n.s.$ Importantly, affect influences could be observed in the treatment condition only, but did not influence appreciation of paintings in the control condition. Thus, effects of affect infusion were restricted to paintings by those artists presented in the treatment condition, indicating that the treatment enhanced mood influences on judgments of liking. According to the Affect Infusion Model (Forgas, 1994) this finding can be seen as supporting the hypothesis of a more demanding and constructive processing of the abstract paintings elicited by the treatment and can therefore be interpreted as an effect of “deeper” elaboration. In terms of the AIM, extended processing should increase the size of mood effects on judgments, “thus the more constructive and elaborate the judgemental strategy, the more likely that affect will be infused into judgments” (1995a, p.749). This is explained by the AIM by a mood priming process in which mood congruent memory associations are activated and influence judgments in a mood-consistent direction (for more details see Forgas, 1995a, or Bower, 1981). Therefore, it can be concluded that explicit information about style led to a deeper processing of new exemplars of the same artists, which allowed greater scope for mood influences and resulted in mood consistent changes in appreciation.

To further investigate this assumption, a simple regression analysis with Positive Affect as predictor and changes in liking as criteria was performed separately for the treatment and control condition. In the treatment condition a significant linear dependence on the initial

³ Four participants, whose positive affect sum-scores were identical to the median were excluded from this analysis.

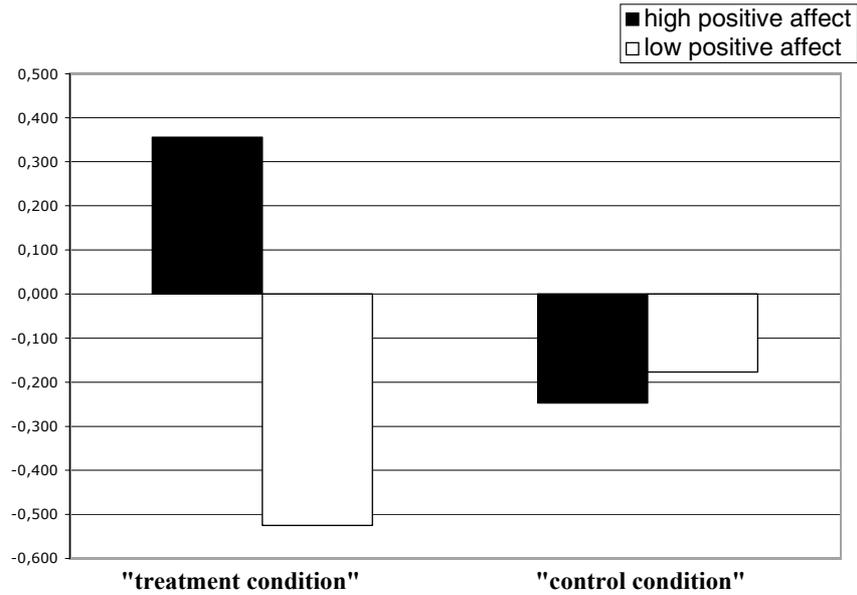


Figure 3:

Effects of style-related information and affective state conditions. Mean changes in ratings of liking (in ranks per picture) between second and first phase for groups of low and high Positive Affect. Positive values indicate higher liking in the second phase.

Positive Affect on day two was found, $R^2 = .09$, $F(1,59) = 5.98$, $p < .05$. Importantly, in the control condition no regression effect of Positive Affect on changes in liking of the pictures could be observed, $R^2 = .01$, $F(1,59) = 0.56$, $p = .46$. Regression analysis confirmed the finding that influences of the participant's affective states on liking were restricted to paintings in the treatment condition. Again, this dissociate affect-influence pattern can be seen as supportive evidence for a deeper elaboration elicited by the extra information.

Furthermore, in a MANCOVA we tested the mere influence of explicit style information on changes in liking by treating the initial affective state (in session two) as a covariate. This procedure made it possible to control the variance resulting from the factor POSITIVE AFFECT. A one-way MANCOVA with CONDITION (treatment versus control) as independent variable and POSITIVE AFFECT as a covariate showed a main effect of CONDITION, $F(2/58) = 4.04$, $p < .05$. Paintings in both conditions yielded lower ratings in liking in the second session, but the amount of decrease was less in the treatment condition ($M_{diff} = .53$). Though only a marginal main treatment effect, this result supports the assumption, that style related processing influenced appreciation of artist's styles slightly positively.

The interrelationship between the quasi-experimental factors POSITIVE AFFECT and EXPERTISE was also tested. First, a contingency analysis revealed that there was no confounding between the two post-hoc assigned groups, $\chi^2(1, N = 60) = 1.13$, $p = .2888$. Second, no intra-individual correlation was found between scores of Positive Affect and Expertise, $r = -.054$, $p = .6844$. Thus, a linear dependence of these factors could be excluded.

Influences of Negative Affect were tested analogously by median-splitting the group on their overall score. No main effect or interaction with the treatment was found. An analysis of the PANAS subscale Negative Affect questionnaire data indicated a significant lack of variance ($SD_{NA} = 2.21$) in comparison to the variance observed for the scale Positive Affect ($SD_{PA} = 5.75$) and compared to a PANAS validation study by Egloff, Krohne & Tausch (1994) ($SD_{NA} = 5.19$). This reduced variance and the tendency not to agree to items assessing negative affect at all, has limited the reliability of the scale and could have inhibited any effects of Negative Affect on Judgments of liking.

Effects of the Treatment on Subjective Time Estimates. According to an attentional model of time perception subjective time estimates can be seen as a valid index of cognitive load (Zakay, 1993). Subjective time estimates should therefore reflect the degree of elaboration in a task where new exemplars of the same artists were presented. In order to compare subjective time estimates in different presentation times, data of time estimates were z-standardized. As predicted, an ANOVA with CONDITION (treatment versus control) and PRESENTATION TIME (5 sec versus 10 sec) as independent variables and the subjective time estimates as dependent variable revealed a main effect of CONDITION, $F(2,56) = 11.38$, $p < .01$.⁴ Importantly, although stylistic information was presented in the first session for 60 sec only, subjective time estimates significantly decreased in the second session in

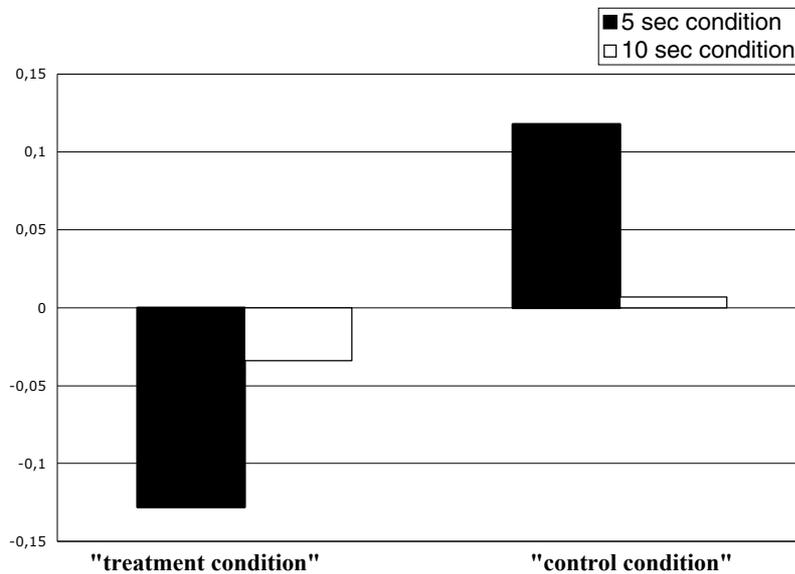


Figure 4:

Mean subjective time estimates of presentation times (for 5 sec and 10 sec) and the treatment and control condition. Positive values indicate overestimation of presentation times.

⁴ Data of two participants could not be analysed due to a recording error and have therefore been omitted from these analyses.

relation to the treatment given. Thus, it could be concluded that style-related information influenced subjective time estimates of presentation times (of new paintings of the same artists), indicating that processing was influenced in the predicted way.

There was also a trend for an interaction between PRESENTATION TIME and CONDITION, $F(2,56) = 3.24$, $p = .0771$, *n.s.* Post-hoc tests showed that effects of style-related information were restricted to time estimates in the 5 sec condition ($M_{diff} = .24$, $t(56) = 3.36$, $p < 0.01$) and did not come up in the 10 sec condition ($M_{diff} = .04$, $t(56) = 0.60$, $p = .5479$). If subjective time estimates reflect participants' cognitive load or degree of elaboration, this result is in accordance with the findings of Leder, Carbon and Ripsas (2006) concerning entitling art. Leder et al found that descriptive titles enhanced „understanding of artists' meaning“ of abstract artworks only during short presentation times. Moreover, their results support the hypothesis that early stages of explicit processing are concerned with basic classifications of style and content. Style information as it was used here can be seen as descriptive and might therefore have enhanced early explicit style related processing.

Art-expertise did not influence processing load of the participants due to the treatment given. Mean intra-individual correlations between estimated presentation times and the level of art-expertise were not significant, $r = .08$, $p = .2177$, neither in the treatment conditions in the five and ten seconds condition ($r = .05$, $p = .7182$ and $r = .09$, $p = .5002$, respectively) nor for the control conditions in the five and ten seconds condition ($r = .12$, $p = .3554$, and $r = .06$, $p = .6181$, respectively). In accordance with these correlations, no main effect or interactions with EXPERTISE were found in a three-way ANOVA with EXPERTISE, PRESENTATION TIME and CONDITION.

General discussion

Style-related processing is considered to be important for aesthetic experiences, especially in abstract art. Here we have shown under which conditions processing of explicit style-related information changed appreciation of abstract paintings. Due to the method, using different exemplars of the same artists between learning and test phase, we assessed effects on appreciations of styles rather than single paintings. Results show that style-related information changed aesthetic appreciation of artworks for perceivers who were rather inexperienced in art or for persons who were in a positive mood. Under these conditions stylistic information was presumably experienced as positive and increased the appreciation of artworks, which had the same style. The lack of an effect in more art-educated people was presumably due to a trivialization of the paintings or an interference with information that experts already use and apply. It will be a question of future research to better understand which kind of knowledge interferes with which kind of information. This question also has consequences for the optimal quality of information accompanying art in museums.

Positive effects of processing the style-specific information are proposed to indicate the pleasing and self-rewarding experience of aesthetic experiences (Leder et al., 2004). Moreover, only in a positive affective state increases in aesthetic appreciation were observed. The finding, that processing of style-related information led to stronger affect influences on ratings of liking, was interpreted in accordance with the Affect Infusion Model (Forgas, 1994) with a more elaborated processing of the paintings. This interpretation is further supported by the results of the subjective time estimates as an indicator of the participants' cognitive

load. Analyses revealed that providing viewers with style-related information affected processing demands and presumably enhanced processing of style at early stages.

Future research might investigate the role of style-related processing under different levels of affective states and art expertise in an experimental manner, as in this study these variables were assessed only quasi-experimentally. Moreover, it seems reasonable to analyse the possibly dynamic interplay between expertise, affective state and style-related processing using structural equation modelling.

Importantly, the present study reveals that effects which are thought to be essential to aesthetic appreciation (Leder et al., 2004) are mediated by expertise and mood. Both findings support predictions of the model of aesthetic experience. Moreover, not considering these variables would have revealed no main effects of style extra information. Thus, we propose that researchers aiming to understand aesthetic appreciation of art consider a number of variables such as initial affective state and level of art experience of the beholder in order to understand the complexity of processes in art appreciation. This, together with the strategy to combine cognitive and affective aspects might be a promising strategy to understand the fascination of art despite the differences between perceivers.

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Appendix: see next page.

Appendix A: List of artworks & artists

1. De Kooning, Willem (1984). Untitled XVII.
2. De Kooning, Willem (1988). Untitled.
3. De Kooning, Willem (1988). Untitled.
4. Hartung, Hans (1989). R34
5. Hartung, Hans (1989). L50
6. Hartung, Hans (1989). K 35
7. Kirkeby, Per (1989). Blick in den Garten I.
8. Kirkeby, Per (1991). Skowhegan V.
9. Kirkeby, Per (1991). Skowhegan I.
10. Klein, Yves (1961). Untitled firepainting
11. Klein, Yves (1961). Untitled firepainting
12. Klein, Yves (1961). Untitled fire-colour-painting
13. Kline, Franz (1953). New York, New York
14. Kline, Franz (1954). Painting Number 2
15. Kline, Franz (1957). Untitled
16. Pollock, Jackson (1946). Eyes in the heat
17. Pollock, Jackson (1947). Full Fathom Five
18. Pollock, Jackson (1950). Lavender Mist: Number 1
19. Rae, Fiona (1991). Untitled (purple and brown)
20. Rae, Fiona (1994). Untitled
21. Rae, Fiona (1994). Untitled
22. Reichert, Hubertus (1987). Untitled
23. Reichert, Hubertus (1987). Blvd IV
24. Reichert, Hubertus (1988). Untitled
25. Richter, Gerhard (1982). Eule
26. Richter, Gerhard (1982). Pavillon
27. Richter, Gerhard (1984). Ingrid
28. Rothko, Mark (1951). Number 7
29. Rothko, Mark (1954). Untitled
30. Rothko, Mark (1957). Black, Ochre, Red over Red
31. Schumacher, Emil (1983). Paso
32. Schumacher, Emil (1983). Dunkle Wolke
33. Schumacher, Emil (1983). Fluss
34. Van Velde, Bram (1936-41). Untitled
35. Van Velde, Bram (1945-58). Untitled
36. Van Velde, Bram (1956). Untitled

Appendix B: List of self-describing items assessing interest in art

1. I am interested in modern art.
2. Painting is my hobby.
3. In school I have particularly enjoyed art lessons.
4. Averaged, I visit art exhibitions once a month

Appendix C: List of artists' names and paintings provided for assessing art-knowledge

Artists' names

1. Henri Matisse
2. Joseph Beuys
3. Salvador Dali
4. Pablo Picasso
5. Jackson Pollock
6. Piet Mondrian
7. Ernst- Ludwig Kirchner
8. Andy Warhol
9. Victor Vasarely
10. Anselm Kiefer

Artists' paintings by

1. Henry Matisse
2. Andy Warhol
3. Mark Rothko
4. Salvador Dali
5. Juan Miro
6. Piet Mondrian
7. August Macke
8. Georg Baselitz
9. Victor Vasarely

Appendix D: Examples of stylistic information

De Kooning

Paintings by this artist are characterized by drawing-like figures standing against a faded background. It is by primary colours that the figurative elements stand out. They seem to resemble abstract cave drawings. The coloured areas of the background clearly show the filigrane, light tints that are so typical of the artist's work. The line-like shapes form a composition that conveys an impression of lightness.

Klein

These paintings, which belong to action and conceptual art, look like yellowed abstract photographs. This is due to the fact that the artist burns compositions into cardboard with two Bunsen burners, which leads to the cloud-like black elements. Latter application of colours onto the upright canvas causes the run of colours that is so typical of these artworks.

Pollock

This artist is regarded the main representative of action painting, a technique that involves application of colours onto the canvas by spontaneous and chance procedures. The colours are dropped onto the canvas in multiple layers and are smeared. That way a close network of line shapes and paint marks is created, which lack any sense of depiction and display an explosive effect. Thus, the process of production is captured as a central element in the artwork itself.

Richter

Their bright and intensive colours characterize paintings by this artist. Through multiple layers of colours the artworks gain great, almost spacial, depth. To create the works, large scrapers and planks are used to pull paint over the canvas. That way colour transitions within different colour-fields evolve, as well as smeared coloured elements without contour. The composition of these very colourful paintings is supported by carefully applied lines.

Rothko

These paintings, composed of vague squares, belong to the realm of colour field painting. The central elements of the works are big, softly-edged areas in warm, deep tints, which nearly take all of the canvas' width. Due to a special technique of glaze the squares seem to hover before a coloured background. The softly edged colour-contrasts and the vagueness of inner structure give the works a kind of calm tension and inner balance.

Schumacher

Typical of this artist is the use of low-keyed, earthy colours, as well as the combination of organically looking massive elements that are strongly suggestive of geomorphic natural shapes. Typical are the very tight black elements that form strong contrasts and are made up of thickly applied colours. Fine dark lines serve to connect the different parts of the painting.