THE EXPERIENCE OF TIME, PLEASURE, AND INTEREST DURING AESTHETIC EPISODES

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ABSTRACT

This study examined time estimations as well as ratings of pleasure and interest for aesthetic episodes varying in duration. It was hypothesized that judgments of exposure duration would reflect the amount of perceptual/cognitive effort needed to appreciate a painting. Effortful processing would lead to overestimation of duration, and automatic or overlearned analysis would produce underestimation. The experiment also examined changes in aesthetic pleasure and interest as a function of exposure duration and stylistic properties of the paintings. Sixteen trained and sixteen naive subjects, including equal numbers of males and females, viewed two sets of paintings varying in collative and stylistic properties for 18, 36 and 72 seconds. The Collative Set of twelve paintings represented two dimensions, Uncertainty and Arousal potential. The Stylistic Set of twelve paintings comprised two dimensions, Representational-Abstract and Linear (hard edge)-Painterly (soft edge). The results for judgment of duration supported the hypothesis. Trained subjects, who possess a repertoire of skills for appreciating paintings, generally underestimated exposure duration. Naive subjects, for whom art appreciation represents an effortful challenge, overestimated duration, especially for the complex paintings. In addition, naive males and females showed opposite monotonic changes in pleasure ratings for the Stylistic Set of paintings. These findings were interpreted in the context of a theory about sex differences in perceptual style.

This article examines encounters between viewers and paintings during the course of aesthetic episodes. Aesthetic episodes, whether in a museum or laboratory, have basic features in common. They formally begin when a
viewer comes into contact with a particular artwork and end when the viewer ceases to explore it. Viewers in both settings usually encounter a series of artworks. The experimenter, like a museum curator, selects the set of stimuli in accordance with a particular theme or goal. Indeed, the boundary between laboratory and museum is blurred when visitors are formally asked to rate paintings at an exhibition [1]. The structure of an aesthetic episode as an encounter between a viewer and a stimulating object makes it amenable to empirical study. It is not surprising that experimental aesthetics was founded by Gustav Fechner over 100 years ago at the outset of scientific research in psychology [2].

The processes which underlie this encounter have been described from both perceptual/cognitive and motivational viewpoints. Cognitively oriented researchers examined the viewers’ “effort after meaning” [3] and describe the means whereby viewers “perceive, organize and comprehend” works of art [2]. This emphasis on the development of interpretive skills is evident in the work of psychologists [4, 5], art historians [6], philosophers [7], and art educators [8]. These various scholars describe operations which help viewers perceive and understand the message and meaning of artworks. Such operations help the viewer “notice” composition, color, tone, texture, subject matter, and other properties of artworks [9].

Motivational theorists such as Berlyne explore the reasons why viewers engage in aesthetic activities [10-12]. Berlyne viewed aesthetic activity as a particular form of exploratory behavior [11, 12]. This activity is affected by an interaction of general stimulus properties and duration of the episode. He coined the term “collative” properties to refer to general structural qualities like complexity, clarity, novelty, etc. [10, 11]. Berlyne then developed experimental paradigms for studying the functional relationship between collative properties and motivational responses such as pleasure and interest during the course of exploratory episodes.

Berlyne’s work on exploratory behavior has direct relevance to the study of aesthetic episodes. In one important study, he used an exploratory choice paradigm in which subjects were presented with two stimuli in close succession and instructed to select one of them for a second viewing [13]. The black and white stimuli in each pair varied in “regularity,” an operational index of complexity. Subjects chose the more “irregular” pattern for a second viewing after a .5 sec exposure, and the more “regular” pattern after 4 sec. Berlyne distinguished two processes to account for these findings. At the outset of an episode viewers are driven by curiosity and engage in “specific exploration” to gather information and reduce uncertainty. During later stages they engage in “diversive exploration” and prefer stimuli which offer moderate amounts of stimulation. Thus, the duration of an aesthetic episode constrains the viewer’s opportunity to interpret and respond to collative stimulus properties.

Ertel used a combination of exploratory choices and verbal judgment tasks to study responses to paintings [14]. Subjects were presented with pairs of paintings for either .5 sec or 4 sec. Those performing the judgment task rated the individual stimuli on five bipolar scales including pleasure, balance, and activity. Subjects performing the exploratory choice task selected one painting in each pair for further inspection. Like Berlyne, he found that subjects selected the more “unbalanced” stimulus after a .5 sec viewing. However, after 4 sec subjects chose the paintings which had been judged more “pleasant.” These more “pleasant” paintings were also found to have gained in “balance” and “activity” relative to their partners. Ertel suggests that viewers select the more “pleasant” painting because it “can be organized by perceptual construction allowing a pleasant repetition of the successful perceptual activity” [14, p. 126]. He arrives at two valuable conclusions. First, perception has a plastic quality, and artworks phenomenally change in the mind of the viewer during the course of aesthetic episodes. Second, aesthetic pleasure is tied to the mastery of challenging perceptual material.

The objective duration of an aesthetic episode determines how much time a viewer has to perform perceptual/cognitive activities and understand the artwork. But what of the viewer’s experience of time during the course of an aesthetic episode? Is the viewer’s subjective experience of duration tied to the amount of perceptual/cognitive activity which is done? A preliminary examination of this problem was undertaken in a study on the perception of Impressionist paintings [15]. Naive and trained viewers were instructed verbally to estimate exposure duration (constant at 35 sec) for fifteen paintings spanning the careers of three Impressionist painters, Manet, Monet, and Degas. Trained viewers underestimated exposure duration for paintings that were high in visual clarity. In contrast, naive viewers overestimated duration for paintings that were high in visual complexity. Judgments of temporal duration appeared to reflect the viewer’s artistic background and the difficulty of analyses performed. Relative clarity led to underestimation, whereas relative complexity produced overestimation.

These findings suggest the need for a theory linking the processing of collative stimulus properties with the experience of duration. The roots of such a theory can be found throughout the history of cognitive literature. Henri Bergson first proposed the notion of “durée,” the subjective inner stream of duration [16]. Much of the research during the next 100 years has functionally related the experience of duration to the processing of nonaesthetic stimulus materials [17, 18]. The data can be summarized by a principle of covariation: the experience of duration varies directly with the active processing of complex stimuli and inversely with the automatic imposition of structure. According to this covariation principle, the greater the number of “images” [19], “changes” [17], or “mental contents” experienced by a viewer [20], the more slowly time will appear to pass. Active processing fills time and produces the subjective experience that it is passing slowly, resulting in an overestimation of duration. Conversely, the automatic imposition of structure should empty time and
produce the experience that it is passing quickly, leading to an underestimation of duration. The principle of covariation accounts parsimoniously for the data reported in the Impressionism study [15].

In this study a more rigorous test of its applicability to aesthetic episodes was attempted. The length of the aesthetic episode was varied (18, 36, 72 sec), and subjects were instructed to estimate exposure duration as well as to rate their experiences of pleasure and interest. Two sets of materials were used to make structural or stylistic stimulus properties salient for the viewers. One set comprised paintings varying on two collative dimensions, Uncertainty (complexity) and Arousal Value. The second set included paintings representing two stylistic dimensions, Representational-Abstract and Linear-Painterly which have consistently emerged from multidimensional scaling studies [21-23]. Individual differences in training and gender were also considered in relation to time estimation and affective response. Trained viewers have extensive repertoires for interpreting artworks and should therefore analyze them more efficiently and quickly than naive viewers. According to the principle of covariation, naive viewers should overestimate exposure duration compared with trained viewers. In addition, complex artworks should lead to overestimation relative to simple artworks.

METHOD

Subjects and Design

A mixed design, 2 × 2 (3 × 2 × 2) was used for the two sets of stimulus materials. The between-subjects variables were Expertise (naive/trained) and Sex. Thirty-two students from the University of Toronto participated as experimental subjects, including eight in each cell of the between-subjects factors. The sixteen trained subjects had taken at least two art courses (either art history or studio) at the University. The sixteen naive subjects had never taken art classes and had not visited an art museum during the previous year. Subjects were paid $3.00 for participating in the study. A second group of twelve male and twelve female naive subjects served as controls and provided baseline verbal duration estimations for the three exposure intervals.

The within-subject variables were Exposure Duration (18, 36, and 72 sec) and the two dimensions in the Stylistic (Representational-Abstract and Linear-Painterly) and Collative (Uncertainty and Arousal) stimulus sets. Three paintings were selected from our slide library as replications in each of the four cells formed by the 2 × 2 combination of the stimulus variables in the Stylistic and Collative sets for a total of twenty-four stimuli. The three stimuli in each cell were shown at each of the three exposure durations counterbalanced across subjects. The dependent variables included estimations of the exposure duration for each episode and ratings of the stimuli on uninteresting-interesting and displeasing-pleasing 7-point scales.

Stimulus Materials

Two sets of twelve paintings were selected from previous experiments for use in this study [21, 22, 24]. The Collative and Stylistic stimulus sets provided a means of making structural and qualitative properties of paintings salient for the viewers. The Stylistic set of twelve paintings involved an orthogonal combination of two dimensions, Representational-Abstract (REP-ABS) and Linear-Painterly (LIN-PTY). Representational paintings emphasize denotative detail, while Abstract paintings selectively combine or disregard such detail. The Linear-Painterly dimension is analogous to a hard edge-soft edge distinction. Linear paintings use the hard edge of outline to define objects and areas; whereas Painterly works present merging color areas and lack defined boundaries. The Collative set of twelve paintings involved the combination of Uncertainty and Arousal dimensions [21, 24]. Uncertainty pertains to the relative complexity of the artwork (low/high) and Arousal value (low/high) represents its potency for evoking attention. The High Arousal paintings are not easily defined [24]. They appear to evoke attention by syncretically combining different principles of order (e.g., realistic shape and unrealistic color).

Procedure and Apparatus

Subjects were run individually and told of our interest in learning about their reactions to a series of paintings which would be presented in color slide format. Stimuli were presented in a randomized order and eight paintings were seen at each of the exposure durations. After each aesthetic episode subjects were given 20 sec to estimate exposure duration and rate the stimuli on two 7-point scales, uninteresting-interesting and displeasing-pleasing. Baseline data on time estimation were obtained from volunteer students. Subjects estimated the duration twice for each of the three exposure durations. The six trials were conducted in a randomized order.

Exposure duration was controlled by an Automated Data Systems timer (Model 1248A) and a Gerbrands shutter (Model G1165) attached to the projector lens. The stimuli were projected onto a smooth white wall 150 cm in front of the subject, yielding an image of approximately 50 × 70 cm.

RESULTS

Time Estimation

The first phase of the data analysis tested the hypothesis that the principle of covariation could be extended to the domain of aesthetic activity. The amount of perceptual/cognitive effort should be reflected in over- and underestimations of the duration of the aesthetic episodes. An accuracy score for time estimation was derived by dividing the subject's estimate of exposure duration by the objective duration of the episode. Proportions above 1.0 indicate overestimation.
judgments of temporal duration could be predicted from Collative properties but not from Stylistic properties of the stimuli.

The data also revealed that judgment accuracy was affected by Exposure Duration. The results of the ANOVAs indicated significant main effects for Exposure Duration with both the Stylistic, $F(2,308) = 5.47$, $p < .01$, and Collative, $F(2,308) = 6.25$, $p < .01$, stimulus sets. Monotonic decreases in time estimation were found, ranging from overestimation for the shortest episode to underestimation for the longest episode (Stylistic set: 1.09, 1.03, .95; Collative set: 1.11, 1.01, .96). These data are consistent with the idea that interpretive activity is greatest at the outset of aesthetic episodes and this is reflected in time estimation. The results for subjects in the control group (1.07, 1.19, 1.01), who estimated exposure durations without viewing any paintings, do not show the same monotonic decrease.

**Pleasure and Interest Judgments**

The Representational paintings were generally found to be more pleasing, $F(1,308) = 71.59$, $p < .001$, $(M = 4.67)$ and interesting, $F(1,308) = 35.81$, $p < .001$, $(M = 4.76)$ than the Abstract paintings $(M = 3.45, M = 3.77)$. Significant interactions of the Uncertainty and Arousal dimensions were also found for pleasure, $F(1,308) = 8.15$, $p < .01$, and interest, $F(1,308) = 13.41$, $p < .001$, judgments. The High Uncertainty-High Arousal paintings were judged to be least pleasant $(M = 3.90)$. In contrast, the Low Uncertainty-Low Arousal paintings were rated as the least interesting $(M = 3.87)$. Too much stimulus intensity reduces pleasure, but too little intensity restricts a stimulus' interest value.

Only judgments of pleasure were found to change over time as a function of individual difference and painting style. These results are especially revealing about the judgments of naive male and female subjects. Significant interactions were found involving Sex, Expertise, Exposure Duration and the two Stylistic dimensions, Representational-Abstract (REP-ABS), $F(2,308) = 3.39$, $p < .05$, and Linear-Painterly (LIN-PTY), $F(2,308) = 3.41$, $p < .05$, for judgments of pleasure. In both interactions the judgments of naive subjects changed monotonically over time, while those of trained subjects were curvilinear. In addition, the trends for naive male and female subjects were opposite. Only the monotonic effects for naive subjects will be considered here because they reflect simpler processes. The results were collapsed into three-way interactions in order to represent the data as simply as possible. The mean differences between Representational and Abstract ratings (REP minus ABS) and between Linear and Painterly ratings (LIN minus PTY) are presented for each subject group at each exposure duration.

When examining the data in Figure 2 it should be recalled that subjects generally preferred Representational over Abstract paintings, $F(1,308) = 71.59$, $p < .001$. Changes in this relative preference are therefore informative. Higher scores indicate that subjects found the Representational paintings more pleasing.
relative to the Abstract paintings. The preference of naive males for REP over ABS paintings was marginal after 18 seconds but increased as a function of exposure duration. In contrast, the relative preference which naive females showed for REP over ABS paintings decreased with longer exposure durations. In short, naive males increasingly found REP paintings pleasing, while naive females increasingly found ABS paintings pleasing.

The results for the Linear-Painterly dimension (see Figure 3) also revealed opposite monotonic trends for naive male and female subjects. Scores in the top half of the figure indicate that Linear (i.e., hard edge) paintings evoked greater pleasure, while scores in the lower half reveal that Painterly (i.e., soft edge) works did so. The naive males found Linear paintings more pleasing at the 18 sec exposure duration, but increasingly rated the Painterly works as relatively pleasing. In contrast, naive females judged the Painterly works to be more pleasing at the 18 sec duration and increasingly found the Linear paintings to be pleasing at the longer exposure durations. The findings for the Stylistic set demonstrate aesthetic flexibility on the part of naive males and females. While displaying opposing preferences after the briefest exposure, naive male and female subjects came to appreciate the other styles as exposure duration increased.

**DISCUSSION**

One goal of this study was to determine whether a viewer's experience of time during aesthetic episodes could be explained in terms of the principle of covariation. A positive expectation was based on the assumption that aesthetic episodes, like other forms of perceptual/cognitive processing, involve the application of analytical operations. These operations can be laborious for the novice and automatic for the trained viewer. The findings support the hypothesis that the principle of covariation can be extended to aesthetic episodes. Naive subjects overestimated exposure duration, particularly for complex paintings. In contrast, trained subjects generally underestimated exposure duration. Thus, aesthetic training and collative properties of artworks interact to affect the experience of duration.
A second feature of the results concerns the relationship between stylistic qualities of the paintings and the viewer's experience of pleasure and interest during the course of aesthetic episodes. Three major findings were observed in the data. First, the time course of affective response was more closely tied to pleasure than interest. Second, these changes were stimulated by specific stylistic qualities of the paintings rather than general collative properties. Third, individual differences in pleasure reveal an interaction of the Sex and Expertise variables.

These latter results are of interest to art teachers because they indicate aesthetic flexibility on the part of untrained subjects. Naïve females found greater pleasure in Representational and Painterly artworks after the 18 sec viewing time. However, as the aesthetic episodes increased in duration, they found greater pleasure in Abstract and Linear artworks. The reverse findings were observed for naïve male subjects. They found increasing pleasure in Representational and Painterly works as the aesthetic episodes became longer. In sum, although demonstrating clear preferences after the shortest episode, novice viewers were open to exploring and enjoying the qualities of the non-preferred styles.

One comment can be offered concerning sex differences in the aesthetic preferences of naïve viewers after the 18 sec duration. The initial or baseline preferences of the naïve males and females are consistent with McGuinness’ discussion of sex differences in perceptual style [25]. She suggests that “females may search ‘pictorially,’ producing a broader field with less depth, while males may search ‘spatially,’ producing a narrow field with greater depth” [25, p. 144]. If females indeed “scan the environment with a greater degree of visual axis” [25, p. 143], this may account for a preference for Representational art which provides specific information for this process. The soft edges of the Painterly style are also consistent with this kind of general exploration of the picture surface. Males, on the other hand, use “vergence movements” which “lead to an understanding and prediction of the relationships of objects in space” [25, p. 143]. This characterization is consistent with the tendency of naïve males to prefer hard edge and Abstract paintings which are amenable to spatial analysis. The flexibility aspect of the data suggest that viewers of both sexes may shift away from their preferred style of exploration given enough viewing time. The fact that trained viewers show no sex differences after 18 sec indicates that experience overcomes stereotyped exploratory styles.

In sum, there is much to be gained from examining the time course of aesthetic perception. This study was conceived within the framework of stimulus properties and response dimensions associated with a particular tradition in psychology. However, there are many different kinds of questions which can be asked about how responses unfold during the course of aesthetic episodes. The development of new paradigms in conjunction with new questions and theories can only further empirical aesthetics.

REFERENCES


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