**COGNITIVE APPRAISALS AND INTEREST IN VISUAL ART: EXPLORING AN APPRAISAL THEORY OF AESTHETIC EMOTIONS**

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**Abstract:**
Since Berlyne’s seminal research, the study of experimental aesthetics has examined interest as a response to art. The present research explores the implications of appraisal theories of emotion for the study of interest as an emotion relevant to aesthetics. Participants viewed pictures of modern experimental visual art and rated each picture for interest and for appraisals of complexity and comprehensibility. Multilevel modeling assessed the within-person effects of appraisals on interest. As predicted by appraisal theories, both appraisals significantly and strongly predicted interest at the within-person level. The within-person relationships were not moderated by individual-differences relevant to interest in art (e.g., trait curiosity). Theories of “aesthetic response” should capitalize on modern theories and findings in emotion psychology.

**Article:**
In the decades following Berlyne’s (1971, 1974) seminal research on “the new experimental aesthetics,” a large literature has accumulated on people’s subjective reactions to art. Much of this research has been guided by Berlyne’s theorizing about the role of collative variables and arousal in determining the reward value of artistic stimuli. The collative–arousal theory of motivation that underlies Berlyne’s research has proved surprisingly resilient, given that psychology has moved away from arousal models of reward and from the concept of “arousal” itself (e.g., Neiss, 1988). Modern research on experimental aesthetics still takes inspiration from Berlyne’s ideas about how collative variables affect arousal, interest, and preference. The influence of the Berlyne tradition may be best seen in the intensity of debates about alternative theories of aesthetic response (e.g., Boselie, 1991; Martindale, Moore, & Borkum, 1990; North & Hargreaves, 2000; Whitfield, 2000).

Tan (2000) recently noted that the study of art has not paid much attention to emotion psychology. It seems surprising that the study of subjective responses to art would be so disconnected from the modern psychology of emotions. Yet, it is not so surprising when one considers Berlyne’s (1971, p. 62) view of emotions: “The word ‘emotion’ is actually not much used by contemporary psychologists ... as with many other terms taken over from ordinary language, the boundary lines of what it denotes are not distinct enough or properly located for the purposes of science.” He went on to reduce emotions to states of arousal by labeling them as states of high activation (cf. Duffy, 1934). Emotion psychology had not fully matured during the development of the new experimental aesthetics, so it was reasonable to frame aesthetic problems in terms of prevailing psychobiological theories of motivation. Since then, however, emotion psychology has come of age, and it offers powerful theories for explaining the dynamics of emotional responses. It seems time for experimental aesthetics to consider the value of concepts offered by emotion psychology for the enduring problems of psychology and art.

The present research considers the question of the interestingness of art from the perspective of appraisal theories of emotion. Appraisal theories do a good job of answering the central questions of emotion psychology (Ellsworth & Scherer, 2003; Roseman & Smith, 2001), so they are a good starting point for considering emotional responses to art. After reviewing appraisal theories, an experiment is presented that tests the central predictions of an appraisal approach to interest in art. Although this study only scratches the surface of the
implications of an appraisal model of aesthetic emotions, it demonstrates some new predictions offered by appraisal theories and suggests fruitful directions for future research. These directions, along with comparisons of appraisal theories with other theories, are then discussed.

AN OVERVIEW OF APPRAISAL THEORIES
One of the fundamental questions for emotion psychology is why people become emotional (Roseman & Smith, 2001). The history of thought on emotions has offered many explanations (Oatley, 2004), including nihilistic claims that there are no emotions (e.g., Duffy, 1934). Modern research generally agrees that appraisal theories offer a powerful way of explaining the dynamics of emotional experience (see Schorr, 2001; Silvia & Warburton, in press). Appraisal theories are set apart from other theories because they assume that emotions come from evaluations of events (Lazarus, 1991; Roseman & Evdokas, 2004; Scherer, 2001; Smith & Ellsworth, 1985). People continuously evaluate events in the world. Events appraised as relevant to the person are evaluated further. Emotions result from these patterns of evaluation, known as appraisal structures. The appraisal approach can be seen as a “cognitive approach” to emotions, because emotions are traced to evaluations of events. It would be inaccurate, however, to equate the process of appraisal with conscious reasoning. No appraisal theories assume that appraisals must be conscious and controlled (Roseman & Smith, 2001). To the contrary, appraisal processes are presumed to typically be nonconscious and automatic (Smith & Kirby, 2001). Appraisals need to be fast because the environment can change quickly (Lazarus, 2001).

According to appraisal theories, events themselves do not cause emotions (see Lazarus, 2001). Subjective appraisals of events are the local causes of emotions; events themselves only affect emotions by affecting appraisals. This firm subjectivity sharply diverges from the Berlyne tradition, which was skeptical of cognitive psychology (see Berlyne, 1975; Cupchik, 1988) and preferred to connect aesthetic response to “objective” features of the art object. Yet, this subjectivity enables the appraisal approach to explain some of emotion psychology’s hardest questions. If events cause emotions, it’s hard to explain why an event evokes different emotions in different people (Roseman & Smith, 2001). These questions are easily handled by assuming that subjective evaluations of events cause emotions. If different people appraise the same event differently, then different emotions will result.

Most appraisal research focuses on the structure of appraisal, the evaluations that collectively constitute the emotion (e.g., Smith & Ellsworth, 1985). Each emotion has a unique appraisal structure. Most theories express an emotion’s appraisal structure as a set of elemental appraisal components (see Kuppens, Van Mechelen, Smits, & De Boeck, 2003). Common appraisal components include, for example, appraising events as relevant to a goal, evaluating resources for coping with an event, making attributions of causality and responsibility, judging an event’s congruence with a motive or goal, and assessing whether an action falls short of personal and moral standards (Lazarus, 1991; Roseman, 2001; Scherer, 2001). The appraisal structure of anger, for example, involves (1) appraising an event as relevant to a goal; (2) appraising the event as incongruent with the goal; (3) judging a threat to one’s social- or self-esteem; and (4) blaming someone for the threat (Scherer, 2001).

APPRAISALS AND INTEREST
Appraisal research regards interest as an emotion associated with curiosity, information-seeking, and intrinsic motivation (Consedine, Magai, & King, 2004; Fredrickson, 1998; Izard, 1977; Silvia, in press; Tomkins, 1962). Like other emotions, interest has an unique appraisal structure made up of a set of appraisal components (Ellsworth & Smith, 1988). Two appraisal components are central to interest (Silvia, 2005). One of the first judgments in the appraisal sequence, according to Scherer (1999, 2001), is a “novelty check”—whether or not an event is new, sudden, unfamiliar, ambiguous, complex, obscure, uncertain, mysterious, contradictory, unexpected, or otherwise not understood. The output of this appraisal is a subjective feeling of disrupted processing and uncertainty. The first appraisal component is clearly rooted in Berlyne’s (1960) analysis of the collative variables. With an appraisal approach, however, Berlyne’s (1975) behaviorist emphasis is supplanted by an emphasis on subjective cognitive judgments. For predicting the experience of interest, perceptions of complexity rather than “objective complexity” are central.
The second appraisal component is coping potential, which refers broadly to estimates of resources, power, abilities, and control in relation to an event (Bandura, 1997; Ellsworth & Scherer, 2003; Lazarus, 1991; Scherer, 2001). Judgments of coping potential appear in the appraisal structures of many emotions (see Ellsworth & Scherer, 2003). For interest, coping potential refers to people’s appraisals of whether they can understand the ambiguous event. Upon appraising something as unfamiliar, complex, and ambiguous, people appraise the likelihood that the poorly-understood event will become coherent and clear (Silvia, 2005). Thus, perceptions of comprehensibility and meaningfulness are seen as pivotal to the experience of interest (cf. Martindale et al., 1990). The Berlyne tradition has not considered this class of variables, perhaps because of Berlyne’s (1975) skepticism of subjective cognitive judgments.

Indirect Support
Past research in experimental aesthetics is consistent with the appraisal perspective on the cause of interest. Little needs to be said about the vast literature showing effects of novelty—complexity variables on interest (see Berlyne, 1971; Silvia, in press, chap. 3). More intriguing are studies that show effects of coping potential on interest. Differences in appraised coping potential translate into differences in interest. Experts in art and music—i.e., people with higher abilities to understand art and music—prefer relatively complex images and melodies, whereas novices prefer relatively simple images and melodies (Francês, 1976; Hare, 1974; Hekkert & van Wieringen, 1996). In one experiment, for example, experts rated abstract art as more understandable and as more interesting (Millis, 2001, Study 3). Adults and children show a similar difference—adults prefer relatively more complex images and music (Bragg & Crozier, 1974). Walker’s (1980) “hedgehog theory” of complexity and preference predicts that people prefer higher complexity as their experience increases. These findings fit the hypothesis that appraisals of coping potential affect interest.

A second body of work in experimental aesthetics explores the effects of meaningful information on interest. Several experiments show that titles enhance positive emotional responses to art by making art more comprehensible. Providing titles for abstract paintings increases the viewer’s appraised ability to understand the paintings (Russell & Milne, 1997). In turn, people enjoy the art more, especially when the titles promote elaborated representations (Millis, 2001). Providing extensive information about a painting, such as the artist’s biography and the context of the work, has a large effect on appraised understanding and on emotions (Russell, 2003). These experiments show that emotional responses can be enhanced by increasing appraisals of coping potential. It is worth noting that an appraisal perspective sees the two seemingly different findings—expert–novice differences in interest, and effects of titles on interest—as stemming from the same underlying processes. This foreshadows the potential fruitfulness of appraisal theories for aesthetic problems.

Direct Support
Recent experiments have directly tested the predictions made by an appraisal model of interest, using aesthetic stimuli as the context (Silvia, 2005). In the first study, people gave self-reports of their ability to understand complex art. People then viewed random polygons that ranged from 4 to 160 sides. One group was asked to pick the “most interesting” polygon; a second group was asked to pick the “most enjoyable” polygon. Appraisals of ability to understand significantly predicted the complexity of the most interesting polygon. As people felt more able to understand complex art, they picked highly complex polygons as being the most interesting. Moreover, appraisals of ability to understand predicted the level of complexity that people found interesting but not the level that people found enjoyable, consistent with past research (cf. Ellsworth & Smith, 1988; Russell, 1994; Russell & George, 1990; Russell & Gray, 1991; Silvia, in press, chap. 2).

A second study manipulated coping potential. In a control condition, people read a complex poem, appraised their ability to understand it, and reported their feelings of interest. In a high-ability condition, people received information that unlocked the poem’s meaning. As expected, people in the high-ability group found the poem more interesting than did people in a control group. Mediation analyses showed that appraisals of ability to understand fully mediated the effects of the manipulation on interest. The extra information about the poem’s meaning increased perceived ability to understand the poem; understanding, in turn, increased interest.
In a third experiment, people viewed simple and complex pictures taken from books of modern visual art. For each picture, they gave ratings of interest and ability to understand the picture. Interest depended on both complexity and coping potential. For simple pictures, ratings of ability to understand were unrelated to interest. For complex pictures, however, ability strongly predicted interest—interest increased as appraised ability increased. Controlling for possible “third variable” confounds, such as trait curiosity and positive affectivity, didn’t affect these relationships.

In a final experiment, appraisals predicted behavioral expressions of interest. People viewed random polygons, ranging from simple to complex, on a computer screen. Their appraised ability to understand complex art had been measured earlier in the semester. People could view each polygon for as long as they wished; when the image became boring, they could press a key to move to the next image. Consistent with the appraisal model, appraisals of ability interacted with the polygons’ complexity to predict viewing times. People spent the most time viewing an image when they felt able to understand complex art and the image was highly complex. In addition to illustrating the joint role of the two appraisal components, this experiment shows that the effects of appraisals on interest are not limited to self-reports.

THE PRESENT EXPERIMENT
The present experiment tested an appraisal theory’s predictions about interest in visual art. In contrast to past research, the present experiment tested within-person effects instead of between-person effects. Most research in psychology assesses relationships between variables at the level of the sample. Strictly speaking, however, appraisal predictions are within-person predictions. For a specific person, appraising something as new and as comprehensible should increase that person’s interest. Yet, within-person designs and analyses are generally uncommon in both emotion research and in experimental aesthetics (see Jacobsen, 2004).

Beyond mapping onto the assumptions of appraisal theories, within-person tests avoid interpretation problems noted by Walker (1980, 1981). Walker pointed out that group-level trends provided by between-person designs obscure variability in within-person relationships. For example, an inverted-U trend that appears for a sample usually reflects the aggregation of trends at the individual level. It is possible, as Walker noted, to find a quadratic trend at the sample level but find only positive and negative linear patterns at the within-person level (Aitken, 1974). Thus, within-person predictions should be tested with within-person designs.

METHOD
Participants
A total of 34 students—27 women, 7 men—enrolled in General Psychology at the University of North Carolina at Greensboro participated and received credit toward a research option.

Procedure
The procedure of the present experiment was modeled on a previous study of the appraisal structure of interest (Silvia, 2005, Experiment 3). Participants were told that they were taking part in a study of perceptions of visual art. Each person received a questionnaire that contained measures of individual differences followed by a series of pictures. Before viewing the pictures, people completed a 10-item scale measuring trait curiosity from the Values in Action inventory (see Kashdan, 2004). This scale measures a general tendency to be interested and curious (e.g., “I find the world a very interesting place”). Participants then completed measures of dispositional positive and negative affectivity, using the trait form of the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). This 20-item scale measures tendencies to experience positive affect (PA) and negative affect (NA). High PA reflects a tendency for active, positive emotions like interest (see Watson, 2000; Watson, Wiese, Vaidya, & Tellegen, 1999).

After the measures of individual differences, participants viewed 29 pictures. The pictures were black-and-white images taken from books and journals of experimental visual art. Specifically, the images were taken from books by John M. Bennett and Andrew Topel (2002), Ken Harris (2001), Geof Huth (1990), Gustav Morin
Participants viewed the 29 pictures in the same random order. After viewing a picture, they rated their impressions on a set of 7-point semantic-differential scales. The scales were taken from past research (Berlyne & Peckham, 1966; Evans & Day, 1971). Interest was measured with two scales: INTERESTING : UNINTERESTING and BORING : EXCITING. Appraised complexity was measured with COMPLEX : SIMPLE. Appraised ability to understand the picture was measured with three scales: COMPREHENSIBLE : INCOMPREHENSIBLE, COHERENT : INCOHERENT, and MEANINGFUL : MEANINGLESS. After completing the questionnaire, participants were thanked and given more information about the study’s nature and purposes.

RESULTS

The 2 items measuring interest and the 3 items measuring appraised ability were averaged to form interest and ability scores. The values for interest, ability, and complexity were scored so that higher values indicate higher levels of interest, ability, and complexity. The data have a nested, multilevel structure—the responses to the 29 pictures are nested within people, and there are 34 people in the sample. Nested data can be analyzed with multilevel modeling, a powerful class of techniques for simultaneously estimating within-person and between-person effects (Hox, 2002; Kreft & de Leeuw, 1998; Luke, 2004).

The multilevel modeling analyses were conducted with HLM 5 using maximum-likelihood estimation. Due to concerns regarding non-normality, the reported effects were estimated using robust standard errors (Hox, 2002, p. 200). Within-person variables (i.e., ratings of interest and appraisals of complexity and coping potential) were group-level centered, that is, at the mean for each person. Between-person variables (i.e., trait curiosity, PA, and NA) were centered at the mean for the sample (see Cohen, Cohen, West, & Aiken, 2003).

The within-person regression equation was Interest = B0 + B1(Understanding) + B2(Complexity) + R. The elements of the equation have similar meanings to traditional regression analyses, although they refer to effects within a single case. Thus, interest was modeled as the individual’s average interest across the 29 pictures (B0), slopes for how the individual’s appraisals of ability to understand (B1) and complexity (B2) for each picture predicted interest, and residual error (R). An intuitive metaphor for multilevel modeling is to think of computing this equation for each of the 34 people in the sample (although that is only metaphorical; see Kreft & de Leeuw, 1998, chap. 3; Nezlek, 2001). The average values for B1 and B2 can then be interpreted as the average within-person relationship between appraisals and interest.

The analyses found a significant average intercept (B = 4.07, SE = .11, p < .001) and highly significant effects for both appraisal components. Consistent with much past research, the appraised complexity of the picture predicted interest, B = .347, SE = .032, t(33) = 10.7, p < .001. Furthermore, the appraised ability to understand a picture significantly predicted interest in the picture, B = .509, SE = .057, t(33) = 8.9, p < .001. Thus, at the within-person level, pictures were more interesting when they were appraised as more complex and as more easily understood. This strongly supports the appraisal predictions.

Within-person relationships can be illuminated by examining the distributions of the within-person slopes. The within-person slopes for the effects of appraised understanding and appraised complexity are plotted in Figure 1. (These are empirical Bayes estimates of the slopes, also known as posterior means or shrinkage estimators; see Hox, 2002; Snijders & Bosker, 1999). The histograms show that the relationships between appraisals and interest were entirely positive. For both appraised understanding and appraised complexity, 100% of the slopes were positive. People differed in how strongly the appraisals predicted interest, but there was no variance in the direction of the relationships between appraisals and interest. This is consistent with the appraisal approach’s assumption regarding the necessity of appraisals for emotions (Silvia & Warburton, in press).
An appealing feature of multilevel modeling is the ability to analyze between-person differences in within-person relationships (Nezlek, 2001). For example, people in the present sample varied in the strength of the relationship between appraised complexity and interest (see Figure 1). Although the relationship was positive for everyone, complexity had a stronger effect on interest for some people relative to others. The distribution of within-person slopes can be analyzed as a function of between-person variables. Before viewing the pictures, participants had completed measures of trait curiosity, positive affectivity (PA), and negative affectivity (NA). These individual-differences might moderate the relationship between appraisals and interest. Stated differently, there may be cross-level interactions between traits and appraisals.

Multilevel analyses assessed whether trait curiosity, PA, and NA predicted the within-person slopes and intercepts. Only one significant effect appeared. Trait curiosity significantly predicted the average within-person
interest intercept, $B = .34$, $SE = .124$, $t(30) = 2.9, p < .007$, meaning that people high in trait curiosity on average found the pictures more interesting. None of the individual differences predicted the appraisal–interestslopes. Thus, the within-person effects of appraisals on interest were independent of these traits.

**DISCUSSION**

The present research examined interest in visual art from the perspective of appraisal theories of emotions. Appraisal theories view interest as an emotion, not as a judgment (Aitken, 1974) or a stimulus property (Hidi & Berndorff, 1998). Thus, as with all emotions, interest is brought about by a distinct pattern of appraisals (Ellsworth & Smith, 1988; Silvia, 2005). The two appraisals central to interest—an appraisal of novelty–complexity, and an appraisal of coping potential—clearly predicted interest in visual art. Within-person analyses showed that people found the visual images more interesting as the images were appraised as more complex and as more comprehensible. These relationships were strong and highly significant. Moreover, every person in the sample showed positive relationships between appraisals and interest, indicating invariance in the directional effect of appraisals.

An appraisal theory of aesthetic emotions has many implications. Some of the more salient implications can be addressed here. First, an appraisal perspective would expand the number and kind of emotions studied by researchers in experimental aesthetics. One of Berlyne’s legacies is a narrow view of the possible responses to art. Research to date has emphasized ratings of enjoyment and interest (see Russell, 1994), the responses that figured in Berlyne’s research. But there are a lot of emotions, and the emotions evoked by art extend beyond interest and enjoyment. An appraisal model can make predictions about other “epistemological emotions” (Ellsworth, 2003; Keltner & Shiota, 2003), such as wonder and awe, as well as emotions like anxiety, shame, confusion, disgust, and anger (Lazarus, 1991; Scherer, 2001). The traditional psychobiological model, in contrast, has little to say about the broader set of emotions that can be experienced in the context of art.

Second, an appraisal model assumes that cognitive appraisals are the proximal causes of emotional experience. As a result, factors that affect emotions should do so by affecting appraisal processes (Roseman & Smith, 2001; Scherer, 1997). This assumption enables an appraisal model to reinterpret and thus integrate research in terms of appraisals. For instance, research by Russell (2003; Russell & Milne, 1997) shows that titles increase positive emotional responses to paintings (cf. Millis, 2001). From an appraisal perspective, titles should increase the viewer’s appraised ability to comprehend the work; in turn, this will increase the experience of interest. Consistent with this prediction, providing titles for abstract paintings increases the viewer’s appraised ability to understand the paintings (Millis, 2001; Russell & Milne, 1997). Thus, what appears to be an isolated finding—how titles affect the experience of art—can be understood as an instance of broader principles of appraisal and emotion.

Third, appraisal theories offer new predictions for when and why individual differences affect emotional responses to art. As one might expect, appraisal theories trace individual differences in emotional experience to individual differences in patterns of appraisal (van Reekum & Scherer, 1997). Chronically angry people, for example, are angry because they are more likely to appraise events in ways that generate anger (see Berkowitz & Harmon-Jones, 2004; Kuppens et al., 2003). Several individual differences predict emotional responses to art, such as openness to experience, sensation seeking, schizotypy, and extraversion (Feist & Brady, 2004; Furnham & Walker, 2001; Rawlings, 2000, 2003; Rawlings & Bastian, 2002; Rawlings, Twomey, Burns, & Morris, 2002). An appraisal approach predicts that differences in appraisals underlie these differences in emotional responses, although this prediction has not yet been tested.

Finally, the most general implication of the present research is the value of modern theories of emotions for the study of aesthetics. Modern affective science does not explain emotions in terms of collative variables, arousal potential, and inverted-U curves relating arousal and reward. Indeed, the notion of general arousal is now anachronistic (Neiss, 1988). Modern emotion theories could be a fertile source of ideas for the next generation of research on experimental aesthetics.
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REFERENCES


