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Emotion in Painting and Art Installations

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Paintings are static 2-dimensional images with limited narrative means. On the basis of a critical analysis of the relevant laboratory scaling studies, museum studies, and neuroaesthetic work, the article reaches a negative conclusion about most paintings' ability to engage sufficiently with general viewers' associative-memory systems, so as to lead to identification and empathy, and induce fundamental psychobiological emotions. In contrast, designers of art installations can draw on subtle combinations of several classes of stimulus properties with psychological significance subsumable under the classical concept of the *sublime* (physical grandeur, rarity, an association with beauty and with biologically significant outcomes), so that some installations may induce the peak aesthetic emotional response, *aesthetic awe*—as defined in Aesthetic Trinity Theory (Konečni, 2005, 2011), along with the states of *being moved* and physiological thrills. The approach also involves an analytical skepticism about *emotivism*, defined as a culturological proclivity for unnecessary insertion of emotion into accounts of mental life and behavior, especially in the arts. Implications for the role of emotion theory in empirical aesthetics are examined.

I. Introduction

Art has often been associated with emotion in both lay and technical accounts. Although music has led the way in both philosophical and psychological aesthetics, visual art has not lagged by much. The goal of this article is to reexamine the conceptual status of emotion in the domain of paintings—defined here as delimited two-dimensional areas of human provenance offered as “art.”

One of the main questions addressed by the article is whether paintings are capable of inducing genuine psychobiological emotions in viewers (as opposed to merely “aesthetic” ones; “merely” is not meant pejoratively). This question arises because of

all paintings’ obvious limitations with regard to temporal development, dynamics, and the flow of narrative, compared with stories, songs, opera, “program music,” and visually-based multimedia installation art—not to mention theater, ballet, modern dance, and film. One may therefore legitimately ask whether static displays such as paintings sufficiently engage spectators’ intimate associations and memories, enticing them to identification and empathy in an immersive, Stanislavskian sense. After all, it is entirely possible that paintings may be admired or revered, found immensely pleasing or interesting or both, in other words, be *evaluated* along various dimensions—with their essential structure and constellation

of attributes nevertheless falling short with regard to the capability of inducing the commonly recognized psychobiological emotions.

For an examination of their potential effect on emotion to make analytic sense, it is necessary that paintings be considered solely *qua* artworks—that for any observed effect to be treated as positive evidence, it needs to have been clearly caused by the paintings' artistic attributes alone and not by their status as semiotic signs. An example is a portrait of a loved person no longer living. Perusing such a painting, one may become genuinely sad, which, however, may have little or nothing to do with the painting's artistic or aesthetic value or even mimetic success. The painting does not induce emotion as a work of art, but as a displaced or generalized classically conditioned stimulus. An indifferent photo of the person or an old letter might produce a similar effect, sadness. Such an analysis, despite the invoked learning theory principle, is more philosophical than psychological; it contributes to conceptual clarity, and a close kinship exists between a painting's extra-art effect and the extramusical effect of a tune that induces sadness in a listener solely, or mostly, by virtue of visual images or episodic memories to which it gives rise (Konečni, 2008b; Robinson, 2008). In such cases, one would seek the data necessary to carry out causal mediation analyses, which are, at least on a practical level, the purview of psychologists rather than philosophers.

Another question that will be considered in the article is whether installation art, containing combinations of members of certain classes of properties with psychological significance and aesthetic relevance (first fully described by Berlyne, 1971), is more capable than paintings of inducing a nonfundamental but nevertheless powerful emotional response, *aesthetic awe*. Within Aesthetic Trinity Theory (ATT; Konečni, 2005, 2011; cf. Keltner & Haidt, 2003), this state has been hypothesized as related to the fundamental emotions in certain respects (including the physiological components and an impressive memorability) but different in others (such as the ease with which it can be intentionally “switched off”). The “trinity” in the theory's name refers to its tripartite structure, which includes, in addition to aesthetic awe, the less pronounced and more frequent states of Being-Moved (cf. Cova & Deonna, 2014; Hanich, Wagner, Shah, Jacobsen, & Menninghaus, 2014) and

(physiological) Thrills (or chills or frisson; Konečni, Wanic, & Brown, 2007; Panksepp, 1995), in a hierarchical arrangement.

The article consists of six sections. In section II., a relatively commonly held psychobiological view of emotion is outlined and contrasted with some relevant alternative views, including those on aesthetic emotions. In section III., *emotivism* is defined as a contemporary proclivity for unwarranted insertion of emotion and feeling into accounts of mental life, needs, and motivation in daily behavior, in matters artistic and nonartistic (Bottum, 2000; Konečni, 2012b, 2013a).¹ The apparent effects of this stance on concrete theoretical and research practice in psychological and philosophical aesthetics are described. There is also a brief discussion of the loci in painting, in which emotions have been, arguably, rather unjustifiably introduced. Section IV. is central; it presents a multifaceted empirical review, including laboratory and field (museum) studies, a critique of the application of the work on mirror neurons, embodied cognition, and action understanding on viewers' emotions induced by paintings, and the possible routes from paintings' attributes to viewers' psychobiological emotions. In section V., reasons grounded in (a) Berlyne's psychoaesthetic theory, (b) amended philosophical (E. Burke's, I. Kant's) accounts of the *sublime*, and (c) ATT are presented in order to suggest why certain art installations may have an advantage over paintings with regard to emotion induction. Finally, in section VI., implications of the foregoing for empirical psychological aesthetics are considered.

II. A Psychobiological View of Emotion and "Aesthetic Emotions"

Emotion is one of the key concepts in psychobiology. Because the fundamental emotions—anger, fear, joy, sadness, and perhaps only a few others—guide and energize behavior in crucial situations, those with enormous consequences, they have been subjected to evolutionary pressures. Emotions are costly—psychologically, physiologically, metabolically—and reserved for emergencies: they are major events in human phenomenology. The main attributes of the fundamental emotions are that numerous bodily systems are involved, simultaneously

and in tandem; that they are acute, occurring in ‘episodes,’ with feedback loops; highly pronounced; readily identifiable and reportable by the experiencer; that they flood consciousness and are pan-cultural in terms of experience and expression; and that they have an unambiguous cause or object. They can be distinguished from moods, drives, traits, and attitudes.

(Konečni, 2003, p. 332)

The preceding description can be offered as a relatively broadly held psychobiological view of emotion (e.g., Ekman, 1999; Ekman, Levenson, & Friesen, 1983; Levenson, 2003; Scherer & Zentner, 2001; see also Konečni, 2008a, including the model of a prototypical emotion episode, Figure 1, p. 117). There are obviously other theoretical positions (e.g., Barrett, 2006; Oatley, Keltner, & Jenkins, 2006), but almost none dispute that emotions involve a major physiological upheaval; and when an upheaval is caused by an arousing *neutral* activity, such as climbing stairs, it is considered irrelevant for emotion (e.g., Reisenzein, 1983).² An interpretation of the eliciting event (of the external *object* of the emotion or of its mental representation) is an important component of the majority of emotion theories. Even Jamesians are forced to admit that “bodily changes” must logically be preceded by some information processing (Konečni, 2012b).

The mentioned fundamental emotions cannot be rationally denied on either phenomenological or empirical grounds even by scholars in psychology and philosophy who hold minority opinions; and because these are the emotions known to all humans in terms of both subjective state and recognition in others, it will not do to treat them as merely “naturalistic,” “garden-variety,” or “utilitarian.” Such terminology is sometimes used to suggest a special status for “refined” (e.g., Frijda & Sundararajan, 2007) or “aesthetic” emotions (e.g., Bell, 1914)—alleged mental states that typically do not contain any or most of the key components specified by the psychobiological position. When reading accounts in which some of the key components of refined and aesthetic emotions are said to be “detachment” and “absence of urgency” (Zentner, Grandjean, Scherer, 2008, p. 515), one is tempted to ask why a more appropriate terminology has not been sought instead of muddying the conceptual waters.

There is a deeper issue here. One’s stance—as a theoretician or researcher or connoisseur or layperson—on whether artworks can induce basic emotions or “only” aesthetic ones or no emotion but “merely” deep contemplation and admiration is, it can be legitimately maintained, one of the central aspects of a person’s identity vis-à-vis the arts and even life (e.g., Collingwood, 1938). Psychological aestheticians are divided, although the situation is rather different in music, where, for example, the majority of commentators on a *Behavioral and Brain Sciences* target article (Juslin & Västfjäll, 2008) appeared to agree with the authors that music is able to induce basic emotions (but see also the opposing commentaries by Konečni, 2008b; Robinson, 2008; Scherer & Zentner, 2008; Thompson & Coltheart, 2008), compared with the domain of paintings, in which an analogous claim in a *Behavioral and Brain Sciences* target article by Bullot and Reber (2013) received stiff resistance from a large minority. Bullot and Reber claimed that paintings can “automatically elicit” basic emotions such as anger, fear, and sadness (Figure 2 and section 3.1.2., both on p. 128). What makes their basic-emotion claim rather surprising is the statement that these physiologically very pronounced states are allegedly induced by “epistemic processes in the appreciator’s discovery of the contextual functions and the art-historical context” (p. 128) and that such emotional responses are experienced by people who had reached “artistic understanding,” the top level of “appreciation” in the authors’ scheme—in other words, connoisseurs well versed in a painter’s opus and the period and style to which the painting belongs.³ Epistemic processes are generally a calm and contemplative affair; and the authors’ opinion of connoisseurs, as a group, being the most physiologically aroused by paintings is not in agreement with research evidence that art experts use a narrower range of valence ratings and are far less active than nonexperts in, for example, facial electromyographic responding to paintings (e.g., Leder, Gerger, Brieber, Schwarz, 2014).

Very few philosophical aestheticians have subscribed to the view that paintings are able to induce everyday psychobiological emotions (as defined in this article). Instead, the position most hold is that paintings (and other works of visual art) produce a variety of aesthetic responses ranging from calm contemplation to “aesthetic emotion,” in which physi-

ological arousal is not included. One aspect of the philosophical debate has been about the common features of works of art that produce the aesthetic emotion. Formalist philosopher Clive Bell phrased the question and answer thus: “What quality is common to Sta. Sophia and the windows at Chartres, Mexican sculpture, a Persian bowl, Chinese carpets, Giotto’s frescoes at Padua, and the masterpieces of Poussin, Piero della Francesca, and Cézanne? Only one answer seems possible—*significant form*” (Bell, 1914, p. 8). Significant form is responsible for inducing the aesthetic emotion, Bell went on, and the response could include being “profoundly moved by forms related in a particular way” (p. 11). This is interesting because Being-Moved is one of the three key aesthetic responses discussed in ATT, but it is otherwise not helpful, because neither “*significant form*” nor, especially, “*aesthetic emotion*,” is specified in the detail that would make the terms analytically useful. This is particularly true when the discussion is limited to paintings, as in this article.

For emotion theorists the problem with some philosophical aestheticians’ accounts of aesthetic emotions is conceptual and terminological overinclusiveness. In this regard, both Goldie (2007) and Levinson (1998) are on slippery ground when discussing aesthetic emotions. Because of imprecision in definition and an insufficient consideration of the externally and internally oriented cognitive evaluation (or appraisal) by experiencers, these aestheticians appear to accept the existence of countless emotions or “emotions”—almost anything can be declared to be a part of the aesthetic emotional response. (In this they are joined by psychologists [Zentner et al., 2008]). And in light of the significance of appraisal in the views of most emotion theorists, philosophers who favor the idea of “unconscious emotions” (Prinz, 2004; Robinson, 2005) find themselves outside the mainstream.

Some psychological aestheticians, notably Leder, Belke, Öberst, and Augustin (2004), have theorized about the manner in which aesthetic emotions arise from aesthetic experience. These researchers contend that aesthetic experience has two outcomes, aesthetic judgment and aesthetic emotion. An inspection of their “model of aesthetic experience” (2004, p. 492) reveals that aesthetic emotion is regarded as the *habitual*, essentially unavoidable consequence of viewers’ exposure to visual art. The terms in the diagram

are members of heterogeneous categories, including perceptual processes, artwork descriptors, prior experience, and various cognitive processes. Only one “box” contains an emotion-relevant term, “affective state,” and it is claimed for the art viewer by declaring ad hoc that there is continuous affective evaluation throughout all the processes (p. 493). It is not specified whether the object of “affective evaluation” is the artwork or the self and whether this occurs only in the laboratory or also naturalistically. Nevertheless, from the affective state box, out pops “aesthetic emotion.”

Leder et al. (2004, p. 501) also state that they “believe that the perceiver can continuously access the outcome of affective evaluation,” without explaining why self-monitoring for affect should normally take place in museum settings (unlike the laboratory, where questions can be asked that might prompt self-monitoring). And they continue (p. 502), “In everyday life aesthetic experience is a time consuming process,” yet they soon cite a finding to the effect that visitors at the Metropolitan Museum in New York spend 27 s per artwork (Smith & Smith, 2001). Leder et al. conclude (p. 502) that “visual and cognitive judgments are inherent in the processing which results in an aesthetic emotion,” but the strong claim for the existence of aesthetic emotions is not supported by this theoretical work. (A more detailed critique of the position of Leder et al., 2004, is available in Konečni, 2013a, pp. 392–394).

It is of interest briefly to discuss *disgust* as an aesthetic emotion, albeit “negative” (Bullot & Reber 2013; Silvia, 2013). Many, though not most, emotion theorists deny disgust the status of an emotion because of its reflex olfactory and gustatory nature and the absence of a cognitive component. In this regard, in the case of certain artworks, such as Damien Hirst’s pickled sharks and severed cows, one suspects that a Pavlovian conditioning mechanism is at work.⁴ Besides, any response to these works, including vomiting, can presumably be declared “aesthetic” only because Hirst presented them as “art,” in the Marcel Duchamp tradition. But one might wonder whether a full century after Duchamp, the artist’s *intention*, one that has long been a hackneyed imitative intention (Hirst conceals the banality by the bizarreness), should continue to make something “art,” as opposed to “bluff art” (Konečni, 2005). And if not art, then the pickled shark cannot induce *aesthetic* emotion.

III. Emotivism and the Loci of Emotion in Painting

EMOTIVISM.

Bottum (2000), among others, wrote convincingly about the pervasiveness of trivial music and split-second images, accompanied by an attitude of “sensitivity” and emotionality in society—all at the expense of logic and thorough, calm, rational discourse, for example, regarding morality and justice, which need to be approached through rhetorical modes such as exposition, narration, and argumentation. Indeed, phenomenologically there seems to exist an unjustified amount of emotion and feeling in every aspect of social life, and the arts—in theory, research, and practice—have been an obvious entry point (e.g., Cochrane, Fantini, & Scherer, 2013; Freeman, 2012; Juslin & Sloboda, 2010). Emotivism (see Note 1) can be described as a culturological and quasisociological stance, sometimes encompassing even ideas about geopolitics (Moisy, 2009). Critiques of excessive claims about some links between music and emotion have been published (Konečni, 2009, 2012a, 2012b; Zangwill, 2004). The present article is a substantial extension and elaboration of articles published in a general philosophy journal (Konečni, 2013a) and in the proceedings of a recent conference on empirical aesthetics (Konečni, 2014), the common purpose of which is to urge for a reevaluation of the status of emotion in the domain of painting.

Documenting the prevalence of emotivism would require a book-length manuscript and even then be challengeable on methodological grounds. Even more distant would be the goal of demonstrating conclusively that the emotivist stance directly, and negatively, influences academic behavior and, specifically, research practice in emotion-relevant aspects of psychological aesthetics. All one can reasonably do is point to the *possibility* of existence of this alleged cultural syndrome as a backdrop for various research behaviors that have been observed in print and in hundreds of articles and proposals submitted to journals and granting agencies (in five countries).

What follows is a far from complete list of questionable methodological and reporting practices in the research designed to link art (broadly defined) and emotion, with reference specifically to the following articles: Blood and Zatorre (2001); Djikic, Oatley, and Peterson (2012); Juslin (2000); Krumhansl (1997, 1998); Leder, Bär, and Topolinski (2012); Nykliček,

Thayer, and van Doornen (1997); Sloboda and Lehmann (2001); and van Oyen Witvliet and Vrana (1996). These experiments, published mostly in reputable journals, are singled out because they have been individually critiqued in detail, for various methodological and substantive purposes, in prior publications (e.g., Konečni, 2008a; 2010; 2012c); however, they represent only the tip of the iceberg:

Participants’ experimenter-instructions-guided reports (on questionnaires, rating scales, sliders, etc.) are uncritically accepted as evidence of emotional experience.

Minor fluctuations in psychophysiological indices (galvanic skin response, heart rate, electromyography) are treated as definitive indications of emotion without a corroborating subjective report.

Misleading titles and abstracts of articles in which “emotion” is referred to as if it were the participants’ subjective state although, in fact, the experiment dealt with “emotion” characterizing aesthetic research stimuli (here in quotation marks because works of visual art and music are not sentient beings).

More generally, no systematic efforts are made to determine whether the participants are rating the expressive aspects of aesthetic stimuli or the emotion that they themselves have experienced in a real (as opposed to metaphorical) sense; this often reflects the researcher’s unstated—but factually mistaken—assumption that emotional expression and experience are indistinguishable.

No effort is made to determine whether the participants are treating emotion-related terms in questionnaires as referring to basic, real-life emotions or to as-if, lay parlance, literary, metaphorical, “aesthetic” emotions.

No effort is made to distinguish between the participants’ emotion, mood, attitude, and disposition.

Key aspects of the data are inadequately analyzed and misreported, usually in an “emotion-detected” direction.

Many experimental designs and control conditions reflect *confirmation bias*—emotivist, in the present context, but visibly present in psychology and cognitive science, to which the current debate about the lack of replicability testifies.

Results and models are related without good reason to biological and evolutionary issues (i.e., “scientification”).

LOCI OF “EMOTION” IN PAINTING.

Writing about emotion in the domain of painting has occasionally led some aestheticians, art historians, critics, and artists to psychologically inaccurate (and sometimes “romanticizing”) claims. A considered list of the commonly observed loci of “emotion” in painting was presented in previous articles (Konečni, 2013a, 2014). On this list, among other observations, are: The elevation of an occasionally expressed fundamental emotion by a painter to the status of a permanent personality trait (perhaps inherited) that influences artistic output; the idea that physical handicap, mental illness, and alcoholism inexorably drive the artist to a particular painterly expression; the insufficiently justified imputation of causal influence to stressful life events with regard to the type and quality of an artist’s work (see Konečni, 2012a, for an analysis of this issue in music composers); and the discovery of “emotions,” sometimes numerous ones, within a painting and semiarbitrary efforts to trace them to the artist’s personality dispositions, acute life events, and the influence of particular locales or other artists.

Such “biographical criticism” is one of the bases of the recently proposed “psycho-historical” approach (Bullett & Reber, 2013). A preoccupation with artists’ life circumstances and foibles sometimes results in too much weight being given to uncertain historical data, at the expense of technical issues, such as the precise details of both inspiration and the executive phase of the creative process (Konečni, 1991, 2012a).

IV. Diverse Empirical and Analytic Attempts

LABORATORY SCALING WORK.

Lillian Martin (1906) tried to answer a question posed in psychophysicist G. T. Fechner’s *Vorschule der Ästhetik* (1876): Which features must a visual stimulus, one that has empirically passed the so-called “aesthetic threshold,” have to pass the emotion threshold also? Martin’s experiments involved 20 participants and more than 40 stimuli (lines of different length, thickness, and waviness; six circles; one ellipse). Only the circles passed the generously defined aesthetic

threshold, and no stimuli passed the emotion threshold (by verbal report).

There was very little serious work in empirical aesthetics in the first half of the 20th century until Berlyne (1960, 1971, 1974) shifted his interests in Hullian learning principles and animals first to curiosity and then to humans and aesthetics. However, the “new experimental aesthetics” maintained the Hullian disinterest in emotion, and the dependent measures were mostly verbal. Psychophysiological work on anger, fear, and pain (Ax, 1953; Schacter, 1957) and emotion theorizing were developing quickly, so that it is not surprising that Sargent-Pollock and Konečni (1977; see also Konečni & Sargent-Pollock, 1977, and Konečni, Crozier, & Doob, 1976) combined, in their aesthetics research, Berlyne’s concerns with verbal hedonic measures with a commonly regarded key aspect of psychobiological emotions: physiological arousal.

In their scaling study of paintings, Sargent-Pollock and Konečni (1977) individually tested 12 female participants. In a darkened room and wearing headphones to increase focus, each participant evaluated 120 well-known paintings (projected as 46- × 66-cm images, visual angle 23°) on three 100-mm rating scales: pleasingness, interestingness, and desire to own a reproduction. In addition, a skin conductance (SC) measure (response to image over resting baseline) was obtained for each participant viewing each painting. Sixty of the paintings (“Renaissance”) were painted from 1440 to 1570; the other 60 were painted in the period 1909–1965 and included nonrepresentational and incongruous works. Each painting was viewed for 10 s, followed by a 10-s rating period in the presence of the image. Paintings were seen in six groups of 20, with interpolated rest periods, during each of which an SC resting baseline for the next group was obtained. The Renaissance and 20th-century paintings alternated in each of the groups.

The evaluation results were meaningful, and they replicated and extended Berlyne’s (1971). Interestingly, SC responses were uncorrelated with verbal ratings. However, of greatest interest for present purposes is the fact that a simple pattern was observed on both a between- and within-subject basis: In a group of 20, exposure:baseline ratios initially approached 1.20, then rapidly declined to 1.00–1.05, stabilizing at about 1.00 for the remainder of the session. Further-

more, in the later groups of 20, even the initial ratios were as low as 1.08–1.12. Importantly, this pattern obtained for both Renaissance and 20th-century works, even though there were large differences between the two groups on all three evaluative ratings.

In short, beyond the mundane initial effect of task novelty, there was no physiological effect of the paintings. Moreover, the physiological data pattern was replicated in pilot studies in which images of standard kitchen furniture were used rather than famous paintings. Even though the participants were not directly asked, “Do you feel emotion X?,” one could reasonably maintain that such questions would be misleading, given the rating scale responses that the participants provided and the complete absence of physiological responsiveness. To claim that participants experienced emotions without any physiological arousal at all would again raise the question of the justification for using the term *emotion* under the described circumstances.

Perhaps surprisingly, there is a dearth of subsequent studies of this type. Speculatively, one possible reason for this may be the unwarranted assumption by researchers that findings contrary to those obtained by Sargent-Pollock and Konečni (1977) must exist. Another is that findings of viewers’ nonexistent physiological responsiveness to famous paintings have been replicated in pilot studies but not reported, because they held little interest to researchers.

EMPIRICAL FIELD (MUSEUM) WORK.

Tröndle and Tschacher (2012) recently claimed to have obtained physiological evidence for the emotional impact of viewing artworks in a naturalistic setting. Hundreds of visitors to an exhibition at the Kunstmuseum St. Gallen in Switzerland (volunteers) were equipped with an electronic glove with measurement sensors and a transmitter that sent physical position and physiological data to wireless receivers. There were two physiological measures, SC and heart rate (HR). Participants’ path and length of stay in front of artworks were unrestricted.

A detailed methodological critique of this work is available in Konečni (2013a, pp. 394–396), so only the most relevant aspects are presented here. The physiological information presented in the report is minimal (means and standard deviations for HR and SC are not presented). Evaluations of the “emotional”

aspects of paintings were given by participants during exit interviews, long after viewing. As for the statistical principal component analysis of the assessments, the only factor (of five) that is related to emotion, “Negative Emotion,” has to do with what the paintings conveyed, not the participants’ own state. Only five paintings are discussed. One work, described by participants as containing “aggressive emotions,” actually has the word “aggressive” prominently in its title, and no physiological evidence is provided. With regard to the best-known works on display (two Warhols), the average viewing times were only 9 s for *Flowers* (1966) and 10.5 s for *Campbell’s Condensed Tomato Soup* (1962). The (numerically undocumented) physiological reaction was higher for *Soup*, and it occurred precisely at the time when participants were reading the label, which can probably be explained as excitement caused not by art but by one’s physical proximity to fame (or notoriety).

In the abstract of their article, Tröndle and Tschacher (2012) are careful to avoid using the term *emotion*, yet they interpret the transient increase in arousal (no data are given) when visitors enter the exhibition as being caused by the “encounter with art,” ignoring the mundane effects of moving from outdoors to indoors and of the rules of spatial movement that are well known to designers of shopping malls. Despite the authors’ moderate claims to the contrary, there is nothing in the study by Tröndle and Tschacher to provide empirical support for the idea that paintings may produce emotions in viewers. Still, the *New York Times* critic titled her piece on the study “Heart-Pounding Art” (Spears, 2012).

NEUROAESTHETIC WORK.

Almost concurrently in the 1990s, there were two developments that are of interest for the analysis of the potential effect of paintings on spectators’ emotions. One was Zeki’s speculative *Inner Vision* (1999), which ushered a new research domain, neuroaesthetics (see also Ramachandran & Hirstein, 1999). The other was the discovery of “mirror neurons” in frontal area F5 of the macaque (di Pellegrino, Fadiga, Fogassi, Gallese, & Rizzolatti, 1992; Gallese, Fadiga, Fogassi, & Rizzolatti, 1996), which are responsive both when the monkey makes active movements and when it observes an experimenter’s “meaningful actions.” In both articles, investigators claimed that mirror

neurons, unlike others in macaque area F5, support “action understanding.” Importantly, it has been suggested that mirror neurons support imitation (Rizzolatti & Craighero, 2004), but, because adult macaques do not imitate (Visalberghi & Fraga, 2002), this claim has been restricted to humans. Moreover, additional claims for the “critical role” of mirror neurons in humans have been made to include perception and comprehension of motor actions, imitation, and empathy, among other higher-order cognitive processes (Oberman et al., 2005). It is notable that even though generalizations have been made to humans since 1992, it has not been shown conclusively that humans possess mirror neurons (e.g., Chong, Cunningham, Williams, Kanwisher, & Mattingley, 2008; Dinstein, 2008; Dinstein, Hasson, Rubin, & Heeger, 2007). The problematic nature of generalizations to human higher-order functions, such as imitation and empathy, was summarized by Hickok (2009, p. 1234): “The problem with [enthusiastic] statements [such as those by Oberman et al., 2005] is that the species that has been shown to possess mirror neurons does not, to our knowledge, possess any of these higher order cognitive processes, and the species that possesses the higher order cognitive processes, has not been shown conclusively to possess mirror neurons.” Hickok’s article is an outstanding logical analysis and critical review of the notion that mirror neurons provide the basis of action understanding in monkeys and humans—perhaps the central claim about the role of mirror neurons.⁵

It is against this double background of novelties—neuroaesthetics and mirror neurons—that one should regard the speculative article by Freedberg and Gallese (2007), an art historian and neuroscientist, respectively. Already in the abstract (p. 197), they make the following sweeping claim: “We propose that a crucial element of esthetic response consists of the activation of embodied mechanisms encompassing the simulations of actions, emotions and corporeal sensation, and that these mechanisms are universal,” and then they proceed to discuss various aspects of the role of empathy and embodied simulation in aesthetic experience. An immediate response by Casati and Pignocchi (2007, in the same journal, p. 410) accused the Freedberg–Gallese thesis of “irrelevance to the issues of aesthetic experience and of what constitutes artworks” on the grounds that because

Freedberg and Gallese claimed that similar-looking “non-art” activates mirror neurons as much as “art” does, such activation is not necessary for art judgment. Casati and Pignocchi (p. 410) also asked Freedberg and Gallese to declare themselves on the issue: “Is empathic response . . . constitutive of aesthetic response *tout court*?” In their response in the same journal, Gallese and Freedberg (2007, p. 411), stated, again sweepingly, “We claimed that no esthetic judgment is possible without a consideration of the role of mirroring mechanisms in the forms of simulated embodiment and empathetic engagement that follow upon visual observation.” And they preempted any phenomenological or introspective objection to their statements, as well as experimental testability, by declaring that aesthetic judgment, simulated embodiment, and empathetic engagement “might be precognitive and not always dependent on perception informed by cognition” (Gallese & Freedberg, p. 411).

The article by Freedberg and Gallese (2007) and the rebuttal to Casati and Pignocchi (2007) by Gallese and Freedberg (2007) admittedly appeared before the aforementioned critique of the role of mirror neurons in action understanding by Hickok (2009) and also before the detailed critical analysis of the various hypotheses involving embodied cognition by Mahon and Caramazza (2008). Nevertheless, many of the speculations by Freedberg and Gallese are so striking that they need to be parsed assertion by assertion and questioned on phenomenological, aesthetic, base rates, and evidentiary grounds. Because doing so would require a separate article, in this and the subsequent sections I will analyze three experimental reports (the only relevant ones of which I am aware); in all of them some aspects of the Freedberg–Gallese (2007) theoretical position are put to experimental test.

In the first of these, Umiltà, Berchio, Sestito, Freedberg, and Gallese (2012) performed an experiment in which 14 participants viewed digitized images of three different abstract artworks by Lucio Fontana (“showing one, two, and three cuts in the canvas,” p. 2; these are the works discussed by Freedberg & Gallese, 2007, Figure 3, p. 199), as well as graphically modified versions of the original artworks “displaying the same graphic pattern,” as control stimuli (p. 2). Ratings were obtained regarding aesthetic appraisal

(liking), “amount of movement,” and artistic nature (is it art?); cortical motor activation (measured electroencephalographically on two clusters in each hemisphere) was recorded. The findings were that the participants liked the originals more, perceived them as moving more, and considered them as real artworks more; in addition, mu rhythm suppression was evoked when participants looked at original artworks but not at control stimuli.

The authors’ conclusions on the basis of these data are that (a) participants’ embodied simulation occurs to minimalistic stimuli, but only when they are authentic artworks (contrary to the original claim by Freedberg & Gallese, 2007), (b) “empathetic simulation” leads to liking, and (c) the effect is associated with motor activation in the viewer’s brain. However, there is a major methodological problem with such conclusions. To be convincing, the experiment requires at least one more control group. The differences between Fontana’s originals and the control stimuli (as presented in Figure 1, p. 2, of Umiltà et al., 2012) are multicomponential: They consist of an implied tri-dimensionality, “depth,” and thickness of line. These differences can be summarized by saying that the control stimuli, unlike the originals, are *not elaborated*. The third experimental condition that was required to test adequately the hypothesis and avoid confirmation bias would consist of *elaborated*, non-art, Fontana-like stimuli, such as Fontana’s stimuli (slashes), for example, in green. Without this additional control group, the interpretation of the results is in doubt.

Moreover, Umiltà et al. (2012) make no claims about an emotional effect of the Lucio Fontana-based photographed-sashed-canvas stimuli on the viewer, unlike the original statements about emotion by Freedberg and Gallese (2007). Analogous treatment of the effect of paintings on viewers—that is, no implication of an emotional effect—is also present in two other experimental reports inspired by the Freedberg–Gallese (2007) thesis, which will be, because they lack neural data, discussed in the next section.

POSSIBLE ROUTES FROM ATTRIBUTES OF PAINTINGS TO SPECTATORS’ EMOTIONS.

This section reports the mostly unsuccessful search for the analytically defensible and psychologically possible routes by which paintings—qua artworks,

by virtue solely of their artistic attributes—may induce genuine psychobiological emotions in viewers. Some comparisons with the effects of music on listeners’ emotion may be useful. For instance, in the field of music-and-emotion, the view has solidified that one can make a clear distinction between emotion of which music is expressive (perceptually and analytically available to listeners) and emotion that music may induce in listeners (emotion that a listener experiences). Various mechanisms for emotion induction have been described by Juslin and Västfjäll (2008), but many of these (such as the previously mentioned visual imagery, episodic memory, and evaluative conditioning) involve extramusical mediation or (as in the cases of a brain stem reflex to a sudden, loud tone, and a violation of musical expectancy) are limited to momentary, transient effects. In the domain of visual art, discussion often fails to acknowledge the important conceptual and psychological differences between outwardly directed perception and private experience.

NONFIGURATIVE PAINTINGS.

Abstract works from Kandinsky’s *Abstract Watercolor* (1910) to paintings by de Kooning, Rothko, Pollock, and, for instance, Rauschenberg’s *Erased de Kooning Drawing* (1953), among other examples of extreme “reductivism” (cf. Strayer, 2013), are characterized by a total absence of any kind of narrative. Furthermore, they are intentionally constructed so as to eliminate any easy associations to the world outside the painted image (or blank but framed “image”). One may conclude, therefore, that a serious claim that such artworks induce psychobiological emotions qua art is unlikely.

It is instructive to compare abstract paintings with “absolute” music (pure instrumental, textless, nonprogram). Note that absolute music, even without narrative content and ready associations (e.g., by onomatopoeia or an evocative title), has a very broad range of powerful arousal-raising (if not emotion-inducing) devices. Yet even in the domain of absolute music, formalists have reasonably questioned the idea of genuine emotions being induced (cf. Kivy, 1990; Konečni, 2013b; Zangwill, 2004). Meanwhile, what does abstract art potentially have? Symmetry, balance, color, novelty, complexity, painterliness, and other factors (and their relative or complete absence) may contribute to judgments and aesthetic experi-

ence, and perhaps in some circumstances they may even measurably raise arousal, but they are most unlikely to elicit emotions. For example, when intense reds in a de Kooning are brought up, one must not mistake folk ideas about redness for sound science. There is little, if any, empirical proof for a strong effect of color on people. Even if there is some, it is likely to be on mood or attitude, not emotion—and the effect would depend on long exposure to large swaths of color in hospitals, kindergartens, or prisons.

Levinson's (1998) writing indirectly supports the negative conclusion about the effect of abstract art on emotion. Levinson opens his section 4 by raising the problem of how absolute music, and an Abstract Expressionist painting, can produce emotional responses. He then devotes the remainder of the section to discussion of the possible mechanisms by which absolute music can induce emotion but does not return to abstract art, even to suggest a single possible mechanism; nor does he do that in the remaining sections of his encyclopedia entry (Levinson, 1998, sections 4–6).

However, Taylor, Witt, and Grimaldi (2012) experimentally tested the notion offered by Freedberg and Gallese (2007) that covert involuntary simulation is involved when people observe abstract “gestural” paintings. In five well-designed experiments (Taylor et al., 2012, p. 26) “participants executed arm movements resembling the act of painting horizontal brushstrokes while observing paintings featuring broad, discernable brushstrokes.” The painting stimuli were manipulated so that the direction of the apparent strokes could be to the left or right and the direction of index finger movement necessary to execute the response (pressing a button) also to the left or right. The dependent measure was response time. The underlying expectation here is one of faster responding in the “compatible” left–left and right–right conditions. The prediction in each experiment was a two-way crossover interaction. Such interactions were generally obtained, although in the main study (Experiment 1, p. 28), there was no difference between right and left response direction with “brushstrokes” oriented to the right. There were also indications that the compatibility effect occurred without awareness.

No aspect of these results speaks to viewers' emotion, not even to the degree of liking for the ten doctored abstract artworks. This is essentially a

straightforward cognitive psychology compatibility study. Furthermore, the movement required for the response and the reaction time measure have no analogues in the real-world viewing of paintings. In fact, it is difficult to think of analogues to *any* real-world situation and behavior.

FIGURATIVE PAINTINGS.

With regard to being able to induce emotions in spectators, two separate but correlated aspects of figurative paintings should be kept in mind: pictorial representation of objects that exist in the real world and storytelling by painterly means (visual nonverbal narrative). Real-world objects may be represented with various degrees of clarity and accuracy (degrees of “likeness”). Stories may be told, in more or less detail—leaving more or less for spectators to fill in, based on the knowledge that painters expect their contemporaries to have. Knowledge may be specialized (e.g., myths, the Bible, heroes, battles) or a consequence of daily life in a particular place.

A comparison of figurative paintings with vocal and program music is perhaps instructive. In the music-and-emotion domain, even the formalists do not dispute that program music and, especially, vocal music—unlike absolute music—are capable of inducing genuine emotions. The operative ingredient for inducing emotions in vocal music is considered to be the powerful verbally narrated story; in program music, the minimal narrative content of the work's and its movements' titles may be complemented by associated imagery and episodic memory, as well as onomatopoeic sounds—muskets, cuckoo clocks, or birdsongs.

How do figurative paintings compare? Except for a rare textual exhortation, paintings are devoid of words, which should in any case be irrelevant for emotivist claims about the induction of emotion by visual art. Paintings also lack the temporal dimension of songs and literary works, and so cannot tell stories, certainly not in detail or step by step. All that paintings can do is capture one crucial moment of a story in a static presentation. Realizing this, artists have sometimes attempted to introduce sequence or development, for example, by creating triptychs, but this is comparatively rare. A method painters often use is to increase the amount of information conveyed in the limited space available by including objects

with rich associationist potential. Just one example was the frequent portrayal of musical instruments by Johannes Vermeer, Jan Steen, Hendrick ter Brugghen, and other 17th-century Dutch painters, which brought to the paintings associated meanings and images that a boom in music making involved at the time. For good measure, they sometimes quoted Latin maxims with insinuations about music's connection to sex (Melikian, 2013).

The most successful device for increasing the amount of space available for contextual information, and for showing behavioral intent of figures in the background through their frozen movement, was undoubtedly the introduction of perspective. Piero della Francesca's *Flagellation of Christ* (c. 1460) is an example of brilliant use of perspective to gain informational space.⁶ But perspective, even used in a painting of very large size, is not enough. One can almost conclusively ascertain this by pondering the hypothetical effect on spectators' emotions—or, rather, the almost certain absence of any effect—of the largest painting in the Louvre (660 × 990 cm, more than 65 m² in area), Paolo Veronese's *The Wedding at Cana* (1562–1563).

According to Wullschlager (2013), "religion as well as philosophy always suspected art's ability to move and persuade," and she is certainly not the only art critic to hold an opinion that runs sharply counter to emotivist views. One can point to numerous superb religious paintings that would lend support to the skeptical view of their effect on viewers' emotions. Some examples from Venetian Renaissance master Giovanni Bellini are his *Crucifixion* (1460), the Venice *Transfiguration* (1460), the Naples *Transfiguration* (1480), *Madonna of the Red Cherubims* (1485), and the Alzano *Madonna* (1485). One would be on solid analytic and pictorial grounds (calmness, symmetry, chubby baby Jesus, and so on) when claiming that the judgment about the absence of an emotional effect is not simply a secular bias. Furthermore, in the previously described Sargent-Pollock and Konečni (1977) scaling study, some of the very paintings discussed here were found not to have SC effects on participants.

The third study (Leder et al., 2012) that tested the Freedberg-Gallese (2007) notions addressed the same issue as did Taylor et al. (2012), "that viewing artwork may activate neural movement

programs associated with the way the artwork was produced" (Leder et al., 2012, p. 1479). In this study, five "pointillist-style" and five "stroke-style" ("post-impressionist") paintings were used as stimuli (within subjects) and viewed in a random order for an undisclosed length of time. Participants (between subjects) either "stippled" or made 20-cm left-to-right "strokes" (using a pencil occluded from their view). They did this either while viewing and evaluating the paintings (allegedly achieving "resonance") or 5 min before viewing and evaluating (no "resonance"; between subjects). Even with two of the three factors being between subjects, the predicted three-way interaction was significant at $p < .001$ —a rare statistical event. More significantly, the authors passed over, without comment, two aspects of the results. One was the main effect of the time of the hand movement (the hand-movement-5-min-before control group significantly preferred paintings overall to the hand-movement-at-the-time-of-viewing experimental group), but even ignoring this, there is the fact that the pointillist-with-stippling-while-viewing cell did not differ from the pointillist-with-stippling-before-viewing cell (means of 4.58 vs. 4.42 on a 7-point scale of liking the artwork; Figure 1, p. 1480) and that there was a reversal in the stroke-style-with-stroking-while-viewing cell versus stroke-style-with-stroking-before-viewing cell (4.28 vs. 4.47), which indicates no effect of "resonance" in both of these key comparisons. The highest cell in the experiment was the pointillist-with-stroking-before-viewing cell (4.88), contrary to all predictions.

With regard to relevance for aesthetic appreciation, the Leder et al. (2012) study holds an advantage over the Taylor et al. (2012) experiments in that a measure of "liking" for the works was obtained. Nevertheless, given the results, the Leder et al. study neither supports the Freedberg-Gallese speculative notions nor contributes to an understanding of the appreciation of authentic paintings from an important period in art history, the 1890s. And it is irrelevant with regard to the induction of viewers' emotion by paintings.

FIGURATIVE PAINTINGS SPECIFICALLY PORTRAYING EMOTIONS. Because art appreciation is a highly individual matter, it does not necessarily follow that paintings portraying characters' emotions are more likely than others to

induce viewers' emotions. For example, the Christian *pietà* may leave non-Christians or atheists unmoved by its content. Even then, perhaps the likelihood of emotion induction is somewhat increased, although a key question remains: With the exception of the deeply believing, predisposed minority, is a painter's portrayal of emotion in *pietà* such that both connoisseurs and lay viewers can identify and empathize to a degree sufficient to experience a genuine psychobiological emotion, sadness, and is it truly comparable to what they may, unfortunately, experience in real life (cf. Konečni, Brown, & Wanic, 2008)? In all of the mentioned Bellini paintings, the portrayal of emotion, expressed in faces and gestures, or the palette, is essentially nonexistent. Somewhat of an exception in this regard is his *Pietà* (c. 1460). However, the rarity of such expression is not unusual for the Renaissance, and by no means only the Renaissance. Furthermore, it is quite possible that the majority of viewers would notice that Bellini's *Pietà* and Rogier van der Weyden's *Descent From the Cross* (1435) are expressive of sorrow and would praise the stunning technique while remaining free of genuine emotion themselves.

The possibility of paintings having an effect on emotion as conditioned semiotic signs rather than qua art was discussed in section I. A personal anecdote from a philosopher-aesthetician further illustrates this issue: "I don't experience emotions to paintings, but when I took my eight-year-old daughter to the Louvre, she was frightened by some bloody martyrdom paintings and we had to leave." The highly educated mother appreciates paintings but does not experience emotion in response to them, whereas her young daughter presumably does not respond to "bloody" paintings qua art but to a generalization of possible threat to herself and pain. The child would presumably also want to escape from the scene of a bloody street accident.

Blood is not shown as often as commonly thought. For example, in the portrayals of the martyrdom of St. Sebastian, painted between 1459 and 1616 by Mantegna, Rubens, Guido Reni, Perugino, Hans Holbein the Elder, Giovanni Bazzi-II Sodoma, and El Greco, despite numerous arrows—ranging from one in El Greco (1578) to at least a dozen in Mantegna (1490)—there are only a few drops of blood or none. Without exception, St. Sebastian's face—upturned (except for the Holbein)—shows only a stereotypical pious resig-

nation. Few paintings show beholders, and their faces are always devoid of sympathy and anger, essentially expressionless (e.g., in Holbein the Elder, 1516).

Minimal emotion is portrayed in Caravaggio's paintings *Head of John the Baptist* and *Salome* (1606; 1610, with Salome's face slightly turned away from the severed head on a platter), in his *David Victorious Over Goliath* (1599), and in Guido Reni's (1605) work on the same theme. In Caravaggio's *Judith Beheading Holofernes* (1599), Holofernes's face understandably shows horror at the moment of having his head cut off, but other than her active corrugator muscle, Judith's face shows little. The claim made here of nonexistent or minimal effect of these wondrous paintings on psychobiological emotions should not be dismissed on the basis of title or reputation: they need to be seen, preferably in their museum settings, for viewers' plausible responses to be estimated. From an objective analytical viewpoint, it is reasonable to conclude that the mentioned paintings contain an insufficiently detailed narrative and provide few good reasons for viewers to identify with the characters and experience genuine emotions as a function of empathy.

In Picasso's *Guernica* (1937), the story is non-religious, comparatively recent, and publicized in a humanistic light. Yet the message is hard to read even with foreknowledge. The static pictorial rendition of wartime destruction, with the formal elements of *Guernica*, is a dubious cause of any emotion. What of Goya's (1814) *El tres de mayo de 1808*? The faces of people about to be shot show anguish. Their fate is foretold by the corpses of people already shot. Few do not admire this painting, but do they experience genuine emotions? Even if the context of resistance to Bonaparte is known to viewers (as opposed to believing, for example, that armed robbers were being executed), does the portrayal reach sufficiently into the spectators' individual networks of intimate, experience-based, mental associations for empathy to take place and result in emotions such as sadness or anger? The objective answer is likely to be negative.

Returning to the matter of a painting having an effect as a semiotic sign and being a possible teaching tool on social issues, *The Execution of Lady Jane Grey* (Delaroche, 1833), a rather kitschy painting, is sometimes used in English schools in discussions of historical injustice and violence against women. Because the students have been taught the historical

context, the majority may regard the painting as a pictorial summary and illustration of a social problem rather than qua art.

Paintings seem poor candidates for eliciting genuine psychobiological emotions primarily because they are—as a medium—generally incapable of convincingly telling naturalistic stories about either real-world or otherworldly events with the richness of detail necessary for viewers to generate mental associations that are relevant to their own life experiences. Paintings' narrative is too thin and too remote, and the protagonists are too dissimilar to allow deep enough identification and empathy. A similar conclusion was reached about this last point already in the late 15th century by Cristoforo Landino about Giotto's allegorical *Seven Vices*, the famous frescoes in the Arena Chapel in Padua (Keizer, 2012; Konečni, 2013a). And the same can be said about both Ghilberti's and Brunelleschi's brilliant bronze plaques *The Sacrifice of Isaac*, thought by many to signify the beginning of the Renaissance. An art historian may claim that the plaques have “great emotional depth” (King, 2003, p. 101), but the emotion is objectively in the Old Testament story, not in the story's pictorial rendering or in the spectator's heart.

Several related comments are in order. As was the case in the preceding subsection, some of the paintings discussed in the present one as plausible candidates for causing emotions in spectators were included among the 120 works in the scaling study by Sargent-Pollock and Konečni (1977). None of them had a significant effect on viewers' SC. That foreknowledge was, of course, not the reason that they were brought up in the two subsections and rejected as genuine emotion-induction causes. Rather, the reason for inclusion was the same as it was in 1977: They are major events in art history. Moreover, in this age of art history bloggers' lists such as “ten most moving paintings of all time,” some of these paintings occupy high places. Casati and Pignocchi (2007) accused Freedberg and Gallese (2007) of “cherry-picking,” and the latter scholars indeed needed rare extremes of paintings to try to support their thesis. In the present article, the extremes are discussed to point out that even they are not likely to have an effect—without resorting to the enormous multitude of paintings for which the absence of an emotional effect would be both intuitively and analytically far more obvious.

V. Art Installations and Aesthetic Trinity Theory

Despite their far greater arsenal and versatility, in comparison to paintings, it does not seem analytically reasonable to expect that art installations are capable of inducing genuine psychobiological emotions in viewers either. Unlike especially theater, most installations (with the exception of the work of some performance artists, such as Marina Abramović) do not include live human beings with whom it feels natural to identify and empathize. However, as mentioned in section I., on the basis of ATT (Konečni, 2005, 2011), some art installations may be superior candidates, in comparison to most paintings, for the induction of a rare and powerful emotional response, *aesthetic awe*. (The independently defined responses of Being-Moved and Thrills are omitted from further consideration here.)

In ATT (Konečni, 2005, 2011), aesthetic awe is considered not to be a fundamental emotion but rather a derived (primordial) mixture of two basic emotions, joy and fear. Like joy, aesthetic awe requires existential safety, in the sense of a reasonable degree of controllability of fear-inducing danger; also like joy, and unlike “pure” fear, aesthetic awe is an emotion that can be intentionally “switched off” with relative ease. This peak aesthetic response is regarded as a prototypical response to the sublime *stimulus-in-context*, with the sublime, in this theoretical position (unlike some others in the history of philosophy; Kant was ambivalent), considered to be *external to the observer*. The sublime stimulus is defined independently of aesthetic awe; among its attributes are physical grandeur, rarity, and novelty; a complex relationship exists with beauty.⁷

What is proposed here is that at least some installations are far more likely than paintings to induce aesthetic awe in spectators by virtue of their far greater amenability to being constructed such that they contain sublime stimuli, the aforementioned attributes of which can be fruitfully analyzed in terms of the three stimulus dimensions identified by Berlyne (1971): psychophysical, statistical, and ecological (classical conditioning). The character of these potentially usable properties to a large extent captures the enormous scope of installations, from the hyper-realistic to the otherworldly to the interactive to the theatrical. The conscious or unconscious-intuitive use by installation artists of particular combinations

of these properties illuminates the route by which aesthetic awe may be induced.

Large size is the most prominent member of the psychophysical class of properties; it has been used since antiquity to honor gods, kings, and tyrants. The present age of high technology has changed the methods and the themes. Two examples of works from the preceding decade that rely on the property of gigantism are Richard Serra's enormous abstract steel forms (*The Matter of Time*, 2005) at the Bilbao Guggenheim and Damien Hirst's *Charity* (2003), the 7-m-high, 6-ton, painted-bronze sculpture of a girl holding a collection box. For various reasons—perhaps a disengaged arrogance of excessive size in Serra, perhaps an affected theatricality in Hirst—these works are unlikely to induce aesthetic awe. Large size by itself is often not sufficient to result, qua art, in a strong emotional response.

The second class of properties is statistical, with members such as rarity, complexity, and novelty. With regard to the rarity of materials, Hirst outdid all competitors (including Chris Ofili's use of elephant dung in paintings) with his *For the Love of God* (2007). The platinum skull, encrusted with 8,500 diamonds, may amaze but is very unlikely to move spectators and induce profound aesthetic awe. Hirst is also the leader in the use of the third, ecological class of stimulus properties, which is defined in terms of notable positive and negative reinforcements associated in the past with the components of a work of art. Although Jeff Koons's 13-m-high *Puppy* (1992) may be a favorite on the positive reinforcement side, Hirst wins on the negative side, the biologically noxious, with pickled shark, butchered animals, and *A Thousand Years* (1990), in which maggots hatch in a glass vitrine, become flies, and feed on a severed cow head. But such works also seem unlikely to induce genuine aesthetic awe: Koons's puppy's "cuteness" may induce mild amusement; Hirst's vitrines' putrid sterility may induce nonaesthetic disgust.

However, there exist installations, such as Ólafur Eliasson's "artificial sun" (*The Weather Project* in Turbine Hall of the Tate Modern, London, 2003), that combine aspects of all three classes of artwork properties in a sophisticated manner so as to capture the qualities of the sublime. The sight of a complex yet seemingly straightforward arrangement for a stunningly novel yet vaguely familiar enormous yellow ball

to hover, suffusing the air in the gigantic space with life-giving light, invariably stunned visitors. Many lay supine on the floor, aesthetically overwhelmed. Without claiming scientific validity for (numerous) informal interviews, it may nevertheless be of note that to the simple question, "What do you feel?" the by far most frequent term used by respondents for their experience was "awe."

VI. Implications for Empirical Psychological Aesthetics

Even a partial acceptance by psychological aestheticians working in visual arts of the conclusions reached here would lead them to be more cautious in their claims about emotion. Any discussion of emotion—in the artist, the artwork, or the appreciator—should be preceded by the definition the author espouses. With regard to empirical work, although participants' self-reports of emotion or mood (and their absence) are indispensable and cannot justifiably be replaced by psychophysiological and imaging data (Konečni, 2012c, pp. 8–9), an awareness of the various problems and biases with such reports, uncovered especially in the music-and-emotion area, should lead to increased methodological vigilance. Being cognizant of emotivism may facilitate the detection of false positives in emotion data and constrain theoretical overreaching.

Because of their relative novelty and multifaceted nature, installations present special problems of classification, analysis, and interpretation. But they should prove a rewarding medium for empirical psycho-aestheticians, especially those who are interested in genuine emotional responses to art. ATT provides a useful theoretical milieu, with Aesthetic Awe, Being-Moved, and Thrills all being reportable and measurable. Artists who specialize in installations have proved to be unusually open to both experimentation and input, in part because the physical creation and setting up of the components of their work are so often collaborative. And there has been a trend to design flexible and often very large exhibition spaces in museums and nontraditional locales.

As for researchers with an interest specifically in paintings, who decide to abandon the pursuit of emotions and "emotions," they may instead want to reinvigorate the formalist approach in psychological aesthetics. This would be a move away from an interest in expressive and referential aspects to a renewed focus on line, shape, texture, color, balance,

particular proportions (such as the golden section), and other compositional issues. At least a branch of empirical aesthetics might be devoted to research inspired by the formalism of Greenberg (1961, 1999) and others, which links artistic value to aesthetic experience, with the latter understood as contemplation of what “strikes the eye” in an aesthetic object. One task of many would be to study the process of self-examination and reduction to the core within visual art forms.

Research guided by formalist ideas would ignore Conceptualism, with its aesthetics-free cultural and political agendas, and it would be immune to attempts to historicize and contextualize the appreciation and analysis of artworks. It would abstain from attempts to divine an artist’s motivation and intention that are dominant in the biographical stream of criticism. Formalist analysis is—or can be, when supported by a high level of training in research methods—manifestly more reliable than the contextual and the historical. Formalism addresses the artwork as is and shuns the talk and reading-in that are essential to Conceptualism and the historical-contextual approach.

NOTES

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1. The term *emotivism* is used here in a general, quasi-sociological, cultural-politics sense. This sense is only tangentially related to the “emotivist–cognitivist” dichotomy that has been described by musical formalists such as Peter Kivy, and it is unrelated to the sense in which the term was used by A. J. Ayer and Charles L. Stephenson in moral theory.

2. Of course, situations may arise, as has been shown in laboratory emotion experiments (e.g., Konečni, 1975), when people *interpretively* add the arousal caused by a neutral physical activity to an already existing elevation that had been caused, for example, by a provocation.

3. Becoming a connoisseur is a long-term process. Connoisseurs may remember when they encountered a major painting the first time, but it is unlikely that on that occasion they were already connoisseurs.

4. Note that Hirst’s displays are almost certainly far more powerful as three-dimensional stimuli than they would be as two-dimensional images. Incidentally, in scaling studies conducted in my laboratory over the years, almost no participant reported either disgust or any other emotion or “emotion” to Rembrandt’s *The Anatomy Lesson of Dr. Nicolaes Tulp* (1632)—only various degrees of admiration.

5. Neuroscientists and others familiar with the procedures and findings continue to be sharply divided over the significance of mirror (and canonical) neurons. A tell-tale of the respective stance is whether or not the term “mirror neuron system” is placed in quotation marks in an article (which is actually not a trivial issue). Moreover, both inside the neuroscientific community and especially outside it (let alone the press), there is frequent imputation of causality to correlational data. The causal status of embodiment and empathy with regard to mirror neurons is very different from, for example, the situation in the neuroscientific memory research where functional magnetic resonance imaging studies show activity in both the hippocampus and in the parietal cortex, but whereas lesions in hippocampal areas (in rats, monkeys, and humans) cause severe memory impairment, lesions in parietal areas cause minimal memory deficits (e.g., Hower, Wixted, Berryhill, & Olson, 2014). In the arts (music), one of the most overinterpreted and misunderstood studies with regard to method and causality is that of Blood and Zatorre (2001; see Konečni, 2008a, pp. 125–126).

6. Note the total absence of emotional expression by all concerned in this much-praised work. Piero della Francesca was one of the most accomplished mathematicians among Renaissance painters of high renown and had a special interest in perspective, as demonstrated in his surviving book *De Prospectiva Pingendi* (c. 1480; *On Perspective in Painting*).

7. In discussing the Scottish Enlightenment philosophers’ notions of the sublime, Zuckert (2012) usefully points out that by appealing to the device of “imaginative associations” (e.g., large size brings to mind the limitless power of God), these philosophers could accept certain artworks (as well as nature) as comprising the sublime.

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