Artworks Are Attentional Engines: Normative Conventions and Evaluative Perception in the Arts

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Abstract
There is a standard skeptical concern within philosophy of art that causal explanations in psychology and neuroscience apply equally to our engagement with art that is done well and art that is done poorly and so do not contribute to our understanding of the normative dimension of artistic appreciation. This skeptical concern is often used to challenge the relevance of psychology and neuroscience to our understanding of art. I sketch a crossmodal model for perception which demonstrates that those affective processes responsible for encoding the biological and instrumental value of a stimulus play a critical productive role in perceptual processing. I argue that the ensuing model for affective perception dissolves these skeptical philosophical concerns.

Keywords: affective perception; art; attention; aesthetic judgment; artistic value; categories of art; empirical aesthetics; evaluative perception; normative conventions; philosophy of art.

Introduction
The target of this paper is a standard skeptical argument within philosophy of art about the utility of psychology and neuroscience to explanations of the normative dimension of artistic appreciation. The current debate about this issue reflects a shift in our understanding of the relationship between affect, cognition, and perception. Acquiring art critical knowledge of the productive and evaluative conventions constitutive of a particular category of art can alter my perceptual and evaluative judgments about a range of artworks (Walton, 1974; Seeley, 2013; Stokes, forthcoming). I may, as a result, come to recognize a work as formally dynamic, and consequently appraise it as aesthetically rich where before I thought of it as artistically anemic. Are these differences manifest in changes in my perceptual experience of the work, or are they a result of post-perceptual judgments about the formal properties and compositional relations within the work that I could always already see in it. This question is a variant of a more general question about evaluative perception. Are attributions of biological salience, instrumental value, or emotional significance to an object, action, or event integrated into perceptual experience, or are they the consequence of post-perceptual cognitive judgments? I sketch a model for perception below which suggests that the affective and cognitive significance of environmental stimuli are integrated into perceptual experience. I argue that this model dissolves the standard skeptical worry that research and methods from psychology and neuroscience are ill-suited to explain the normative dimension of artistic appreciation.

A Standard Philosophical Objection
There is a standard skeptical concern about the relevance of psychology and neuroscience to our understanding of appreciative judgments about artworks (Dickie, 1962; Wittgenstein, 1966). Consider the following contemporary variant of this story. Artworks can be conceptualized as communicative devices, stimuli intentionally designed to trigger perceptual, affective, and cognitive responses sufficient to enable consumers to recognize their depictive, representational, semantic, expressive, and aesthetic content. This suggests that we can treat our engagement with artworks as an information processing problem, as a question about how consumers acquire, represent, manipulate and use information encoded in the surface structure of a work to recognize its artistically salient content. Research methods from psychology and neuroscience have been fruitfully used to model the affective, perceptual, and cognitive processes that underwrite these aspects of our engagement with artworks in a range of media (see for instance Carroll, Moore, and Seeley, 2012; Carroll and Seeley, 2013a; Carroll and Seeley, 2013b; Leder, Belke, Oeberst, and Agustin 2004; Nadal, Munar, Capó, Rosselló, and Cela-Conde, 2008). However, evaluative questions germane to artistic appreciation are normative questions about whether a work has been done well or poorly, about its fit to standard conventions governing artistic practice for the relevant category of art. The skeptics’ claim is that explanations couched in terms of the causal-psychological processes that underwrite perception apply equally well to our engagement with artworks that are fit to the evaluative conventions governing production in a category of art as to those that aren’t. Therefore, causal-psychological explanations appealed to in psychology and neuroscience of art cannot be used to model the appreciative dimension of our commerce with artworks. On this account evaluative judgments are post-perceptual cognitive judgments about the fit between what is already seen in a work and the conventions that define appropriate categories of art. What differentiates the novice from the expert is that art critical knowledge enables the latter to differentially focus his or her attention in order to match shared features of a common perceptual experience of the work to productive and evaluative conventions that determine their artistic value.

This is a variant of an old bone of contention between philosophy of art and empirical aesthetics. Fechner (1876), and later Berlyne (1971) argued that the a priori, deductive
methods of conceptual analysis employed within philosophy of art could, at best, reveal the subjective biases and individual tastes of individual critics and theorists. They argued for an empirical aesthetics from below built on the backs of averaged verbal and physiological responses culled from large groups of participants. Philosophers have responded that this would be akin to looking for rules governing the meaningfulness of expressions in a language in the averaged responses of young children. The responses gathered from participants in the target population would be beside the point in this case. What matters here is rather the considered judgments of speakers familiar with the conventions of the language, the rules governing the use of those expressions in practice (Dickie, 1962). Similarly, what matters for understanding art is neither the averaged verbal or physiological responses of large groups of consumers, nor the psychological mechanisms underlying these responses, but rather the considered judgments of groups of experts familiar with the conventions of the language, in this case the normative conventions governing appreciative judgments about different categories of art.

A Model for Evaluative Perception

The central assumption of the skeptical argument is that evaluative judgments and associated valenced responses can not be modeled as an integrated part of perceptual processing. Recent research in affective neuroscience challenges this claim. Quick and dirty cognitive assessments of the biological and instrumental value of perceptual stimuli are integrated into sensory and perceptual processes via a range cortico-cortico and cortico-fugal circuits that play a constitutive role in the production of perceptual experience (Barrett and Bar, 2009; Pessoa and Adolphs, 2010). The subsequent crossmodal integration of affective and perceptual processing is a means to tag stimuli with behavioral significance, a cognitive shortcut by which memory of the affective significance of different types of stimuli in stereotyped contexts can be used to shape the content of perception relative to both the current needs and interests, and long term goals, of a perceiver. This suggests that evaluative perception is the rule in everyday perception, not the exception.

Biased Competition and a Diagnostic Recognition Framework for Perception

This model assigns a key computational role to affective processing in ordinary perceptual contexts. The sensory inputs to perceptual systems are replete with information. Perceptual systems are, in contrast, limited capacity processing systems. Selectivity is, therefore, a critical issue for perception. One way we solve this problem is to focus attention on minimal sets of diagnostic features, or task salient sets of sensory features, sufficient to categorize, and thereby perceptually recognize the structure, function, identity, and affordances of objects or the goals, intentions, and emotional states of other agents (see Schyns et al, 2008). Schyns and his colleagues have demonstrated that changing the way one categorizes a stimulus can alter the diagnosticity of perceptual cues and even change the way we perceive them (Schyns et al, 1998).

How do we succeed in quickly and flexibly orienting attention to diagnostic features in order to bootstrap perceptual recognition in novel, dynamic, everyday behavioral contexts? One means is perceptual salience. We easily orient attention to some features because they stand out in a crowd as brighter, more colorful, or etc. However, behaviorally salient features in the local environment are not always the most perceptually salient. Perceptual systems therefore require a mechanism for assigning salience to diagnostic features independent of perceptual salience. Biased competition models of selective attention suggest that fronto-parietal and cortico-fugal attentional networks are used to solve this problem in everyday perceptual contexts. These attentional circuits endogenously bias perception by priming the firing rates of populations of neurons in sensory systems to the expectation of diagnostic features at particular locations, enhancing the encoding of task salient features, objects, and their parts and inhibiting the perception of distracting, task irrelevant information (Desimone and Duncan, 1995).

Biased Competition and Affective Processing

A broad network of cortico-fugal attentional circuits facilitates the crossmodal integration of affective, sensorimotor, and unimodal perceptual information (Barrett and Bar, 2009; Duncan and Barrett, 2007; Stein et al, 2006), primes sensory processing (Desimone and Duncan, 1995), and can be interpreted to implement working memory by integrating, maintaining, and reinforcing the encoding of salient perceptual information over time (Grossberg, 1999). The general idea is that projections from prefrontal and parietal areas associated with attention, affective perception, spatial working memory, motor planning and preparation, and object recognition to sensory cortices and the earliest stages of visual, auditory, and somatosensory processing in the thalamus facilitate the integration of sensory information into coherent representations of task salient aspects of the local environment and account for the influence categorization processing and cue diagnosticity in perception.

A rough and ready model for evaluative perception emerges from the contributions orbitofrontal cortex (OFC) makes to this model of perception. Medial OFC plays a critical role in estimating the value of a stimulus and encoding this information in autonomic and visceromotor bodily responses that prepare the perceiver to act. Lateral OFC integrates this bodily encoded information about the biological, instrumental, and emotional significance of a stimulus with information from multiple sensory modalities, including fine grained visual information. These regions of OFC are, in turn, reciprocally connected to sensory cortices and so contribute to the attentional circuits that enhance and inhibit the perceptual encoding of diagnostic information. The net result is a crossmodally integrated, contextually sensitive perceptual representation of the behavioral and
affective significance, or value, of target objects (see Barrett and Bar, 2009; Duncan and Barrett, 2007).

There is an intuitive plausibility to this story. Knowledge of the structure, function, and identity of objects, events, and actions is derived from our external sensory-perceptual experience of the world. However, the sight, sound, taste, smell, and touch of objects and events are always also associated with contextually modulated changes in breathing, heart rate, muscle tension, visceromotor, and vestibular responses. We experience these autonomic and visceromotor responses as levels of arousal, pleasure, and discomfort that encode the perceived value of a stimulus and determine the diagnosticity of its features in a context. Our categorical knowledge and episodic memory of objects and events in the world is encoded as sensorimotor patterns that encompass all of these variables (Barrett & Bar, 2009). When perceptual systems call on knowledge encoded in memory to interpret, modify, and modulate sensory signals, we should, therefore, expect that information about the affective-evaluative significance of stimuli in a context will compliment the role played by declarative knowledge of the structure, function and affordances of objects and object types.

Affective Perception and the Amygdala

The model for affective perception articulated here contrasts with the standard model for affective perception in the literature (Pessoa & Adolphs, 2010). The standard model rests on an assumption that emotions are direct, unmediated responses to a special class of environmental stimuli, or that affective perception generates automatic affective responses that function independently of, and prior to, cortical influences on perception associated with cognitive processes like attention and categorization. There are three putative sources of evidential support for the standard model: anatomical evidence of a "low road" subcortical pathway in rodents; behavioral evidence of fast, non-conscious perceptual responses to coarse-grained, low spatial frequency, emotion laden stimuli; and the observation that it would be highly adaptive to have a capacity for fast, automatic, perceptual processing of biologically significant stimuli in a dense, noisy, and often dangerous environment. However, current neuroanatomical evidence does not support the idea of a homologous subcortical pathway in primates (Pessoa and Adolphs, 2010), the time scale of responses in basic-level categorization tasks (19-67ms) is analogous to the time scale for discrimination of stimulus valence (80-150ms) (Green and Oliva, 2009; Kawasaki, Kaufman, Damasio, Damasio, Ganner, Bakken, Hori, Howard, Adolphs, 2001), and reaction times for the detection of fearful faces among distractors in a patient dependent on cortical processing because of amygdala lesions are within the normal range (Tsukiya, Moradi, Felsen, Yamazaki & Adolphs, 2009). These results support the idea that affective responses to emotion laden stimuli involve feedback from a fast, feedforward cortical sweep which yields a coarse, basic level categorization of the stimulus that encodes its biological salience.

Earlier research by Pessoa, Kastner, and Ungerleider (2002) supports this interpretation of affective perception. Pessoa and his colleagues have demonstrated that affective responses to emotion-laden stimuli in moderately high attentional load tasks depend on the availability of attentional resources. For instance, covertly attending to sets of eccentrically presented rectangular bars in a same/different orientation discrimination task eliminated amygdala responses to photographs of fearful and happy faces in normal participants, even when they were fixating on the center of the facial expression. Analogous results have been demonstrated for the perception of basic sensory features, pictures, and words (Rees, Russell, Frith, and Driver, 1999; Rees, Frith, and Lavie, 1997). These results demonstrate that affective perception depends upon the same top-down cognitive processes as object recognition in ordinary contexts, and that top-down feedback generated by a fast cortical sweep through the visual system is alone sufficient to account for affective responses to visual stimuli (Pessoa and Adolphs, 2010). What's the take home message for the current discussion? These results demonstrate that the outputs of affective processes responsible for encoding the value of a stimulus to an organism are integrated with categorical knowledge concerning its structure, function, and identity in perceptual experience.

Revisiting the Standard Objection

Artists’ productive and formal-compositional strategies in the fine arts can be interpreted as devices for culling diagnostic cues from structured explorations of the content of perceptual experience and rendering them in a medium, e.g. color studies, maquettes, story boards, and dailies in film and video production. The constraints on the development of these formal-compositional strategies are the intended content of an artist’s works and the range of productive and evaluative conventions that define artistic practices within his or her community. These productive and evaluative conventions define categories of art. Categories of art, in turn, determine the artistic salience, and thereby perceptual diagnosticity, of the features of a work. For instance, recognizing that a Rodin or Degas belongs to the category Impressionist sculpture, say by noting qualitative aspects of the surface articulation of its forms, is a cue that the artistically salient expressive features of the work lie in the way the muscles have been articulated across the joints of the figure in order to produce the lifelike, spontaneous dynamics of its pose. Categorical knowledge of these productive conventions therefore determine the evaluative conventions a viewer brings to bear in appraisals of whether it has been done well or poorly, which, in turn, determines the modes of attention that shape a viewer's perceptual experience of the work.

The neurophysiological evidence discussed above demonstrates that knowledge of the productive and evaluative conventions that define different categories of art plays a constitutive role in the way consumers perceive an artwork. Evaluative judgments about art, judgments of fit
between a work and normative conventions governing production and appraisal for a category of art, are therefore built-in to the architecture of perception. They are productive constraints that determine what we perceive in a work and how we perceive it. This entails that the standard skeptical argument about the utility of psychology and neuroscience to explanations of artistic appreciation art is not sound.

This should come as no surprise. Consider, for instance, a familiar philosophical thought experiment involving Picasso's Guernica and a fictional class of bas reliefs called Guernicas (Walton, 1970). Guernicas have the same compositional and representational content as Picasso's Guernica, albeit expressed in low relief. The rub is that this caveat entails that the expressive dynamic features Guernicas share with Guernica emerge from different productive practices and different kinds of non-aesthetic formal features. Guernica is a Cubist painting. It's dynamic spatial properties are carried in the fractured juxtaposition of highly contrastive, two-dimensional, black and white forms. This productive strategy produces a short depth of field, collapsing the depicted figures into one another in a chaotic composition. Guernicas achieve the same perceptual effects by articulating the formal-compositional structure of the work in low relief. The formal features diagnostic for the jarring expressive quality of the Guernicas are therefore missing from the flat composition of Guernica, and vice versa.

The community familiar with the category of art [GUERNICAS], so the story goes, would experience the flatness of Guernica as oddly inappropriate, and perhaps even calm and serene, because their perceptual expectations about the work would have been thwarted. Guernica is simply missing critical depth cues that are diagnostic for a Guernicas' dynamic features. We don't have to work too hard to imagine analogously that our community would experience the monochromatic grey-brown surface of the Guernicas as dull and lifeless. The point is that the perceptual features of these works are out of sync with their content when they are categorized incorrectly; the attentional strategies appropriate to the attributed category of art will therefore misfire; perceptual expectations will be unsatisfied; and a viewer’s perceptual engagement with the works will fail to match to the information demands that drive it. My expectation is that these factors will lead an unresolved perceptual tension embodying a negative evaluation of the work as ineffective.

Of course the real story about a viewer’s engagement with (the) Guernica(s) would likely be more nuanced. Violating conventions is a standard productive practice for articulating the content of an artwork. Likewise, puzzling out the purpose of category violations in art is a standard evaluative practice. The low spatial frequency information diagnostic for the formal-compositional structure of these works is roughly the same and would suffice for educated viewers to recognize them as exemplars of the kind of work whose artistic salience lies in the dynamic articulation of their content. When perceptual expectations fail, we would expect these viewers to mobilize knowledge of the formal-compositional strategies appropriate to Cubist painting and bas relief to puzzle out how the artist had intended to articulate the dynamic features of Picasso's Guernica (or the Guernicas). If the works are successful, the model for perception that I have proposed suggests that these consumers would come to experience their dynamic qualities in a novel way by virtue of the deployment of appreciative strategies culled from their declarative knowledge of avant-garde methods, Cubist painting, and bas relief.

All of these aspects of a viewer’s potential engagement with a work can be accommodated by the crossmodal diagnostic recognition framework for perception articulated above. Critically, the model demonstrates that comparisons between the work and conventions governing evaluations of whether it has been done well or poorly will play a productive role in perceptual experience that can be explained neurophysiologically. Therefore, contrary to standard skeptical arguments against the utility of psychology and neuroscience to explanations of the normative dimension of artistic appreciation, the model has the capacity to explain differences in our experience of works that have been done well from those that have been done poorly, and so can contribute to explanations of the normative dimension of our appreciative commerce with artworks.

References


