PART I

Concepts, theories and methods

1 Introduction by the editors

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Tell a casual acquaintance that you study "the psychology of aesthetics" and you will usually engender a response of either amusement or bemusement. Most people are not quite sure what such a field is, but will allow that it is at least esoteric, and, quite possibly, sophisticated. Expanding our field to include the psychology of aesthetics *and the arts*, it is reasonable to query: What is this field about? Is it the study of the beautiful? Is it understanding what we like and why we like it? Is it how we perceive the aesthetic in all objects? Aesthetics has been the object of philosophical speculation for millennia. It has also become the province of psychology since Gustav Fechner's (1876) early aesthetics research involving the Holbein Madonna and the Golden Section. We offer the following definition: The psychology of aesthetics and the arts is the study of our interactions with artworks; our reactions to paintings, literature, poetry, music, movies and performances; our experiences of beauty and ugliness; our preferences and dislikes; and our everyday perceptions of things in our world – of natural and built environments, design objects, consumer products and, of course, people.

This area of study is therefore characterized by the breadth of its focus, with scholars investigating a wide range of human experiences as they occur in vastly different contexts. At the same time, these scholars also touch on the traditional subjects of psychology as these relate to aesthetics and the arts, such as sensation, perception, memory and emotion, as well as relatively obscure topics, such as the experience of awe and the sublime, which for centuries have been the topics of philosophical inquiry.

The methodological approaches that these researchers use are also diverse, from tried-and-tested basic behavioral experiments conducted in laboratories, interviews and surveys performed in museums, and content analysis of images, to state-of-the-art image statistics, eye-movement tracking, electromyography (EMG), measures of electrodermal activity (EDA), positron emission tomography (PET) and functional magnetic resonance imaging (fMRI). The research designs and statistical analytical approaches associated with these methodologies are equally cutting edge.

The psychology of aesthetics and the arts addresses both conceptual-theoretical and applied levels of inquiry. Studies on the evolution of our aesthetic sensibilities help to shed light on the environmental pressures faced by early humans, and neuroaesthetics research is helping us understand the workings of the human visual

system and brain. Aesthetics research has proven very relevant to many important issues and problems. For example, aesthetics research helps us understand how we make "dating and mating" decisions, why we purchase one product over another, and how and why our aesthetic experiences in concert halls, theaters and museums affect us so profoundly.

We hope that the book we are about to present to you will be useful as not only a research tool and a reference for addressing real-world problems, but also as an inspiration of what research might look like in aesthetics and related topics. This volume is the first on the topic of psychology of aesthetics and the arts to be included in the prestigious series of handbooks by Cambridge University Press. We wanted to capture the great diversity and quality of scholarship in this area by asking exceptional scholars to contribute exceptional chapters, not only covering the many facets of our discipline, but also talking about what makes them passionate about their particular lines of research. We gave our authors only rough guidelines on what we wanted, entrusting the realization of the works to their scholarship and their individuality; we have been rewarded with a collection of works that are lively, intriguing and thought-provoking. We thank them for their efforts.

The Cambridge Handbook of Psychology of Aesthetics and the Arts is a foundational piece of literature. The reader can refer to it to get a sense of key concepts and theories, to learn about the questions that are being asked and to become acquainted with the perspectives and methodologies used to answer them. It is a source of knowledge about the historical roots of the psychology of aesthetics and the arts as well as about why and how the field has become one of the fastest-growing and most exciting areas in psychology. In putting together the volume, we had in mind both seasoned scholars and budding researchers, established professors and students, and art enthusiasts and art professionals.

We have organized the volume into five parts. The first part provides an overview of the history, key concepts, theories and methodologies of the psychology of aesthetics and the arts. Oshin Vartanian begins by presenting the history of the discipline including its deep connection to philosophical aesthetics. William Seeley also touches on this connection in his chapter on the relationship (and rapprochement) between philosophical and empirical aesthetics. Gerald Cupchik looks at the theoretical foundations of the field, analyzing the difference between everyday and aesthetic processing, and Aaron Kozbelt and James Kaufman then close the section with a discussion of the different approaches to measuring aesthetic constructs.

The second part covers the different perspectives on the psychology of aesthetics and the arts, beginning with the cognitive-information processing perspective, as explained by Helmut Leder. Following this is a chapter on the psychodynamic approach to psychology of aesthetics and the arts by Pavel Machotka. Marcos Nadal and Gerardo Gómez-Puerto then examine the evolutionary approaches to art and aesthetics. Next, Pablo Tinio, Jeffrey Smith and Lisa Smith look at the aesthetic experience of artworks in museums from the perspective of a person looking at real artworks, in the genuine contexts of museums.

Part III examines psychological aesthetics in different objects and media. Paul Locher discusses the effects of composition and other pictorial elements on aesthetic responses to paintings. Next is a chapter on issues in the psychology of photography (and psychology of images in general) by Chris McManus and Katharina Stöver. This is followed by Paul Hekkert's chapter on the aesthetics of design. The part continues with chapters on other artistic media. Stefan Koelsch addresses the psychology of music perception and music creation. Next, Thalia Goldstein and Rebecca Yasskin present research on the psychology of theater and dance. Swathi Swaminathan and Glenn Schellenberg then examine the relationships among art education, academic achievement and cognitive ability. Following this is a discussion of the aesthetics of the built environment by Andréa Livi Smith. Gernot Gerger and Helmut Leder examine the aesthetic experience of facial attractiveness. Closing this part is David Carr's chapter on the aesthetics of reading fiction.

The chapters in the fourth part explore contemporary issues and debates. We begin with a piece by Anjan Chatterjee on neuroaesthetics, a relatively new area in psychology of aesthetics, and one of the most exciting and thought provoking. This is followed by Stefano Mastandrea's analysis of aesthetic emotions. Emily Nusbaum and Paul Silvia also address emotions, albeit of the unusual kind. Viren Swami and Adrian Furnham discuss the relationship between personality and aesthetic preferences. We end this part with David Bell's chapter on non-Western art focused on the work of the legendary Japanese artist, Hokusai.

In the fifth part, the editors attempt to tie together all of these excellent contributions.

2 Empirical aesthetics: hindsight and foresight

Oshin Vartanian

The beginning of the twenty-first century is certainly a lively period for anyone interested in the psychology of aesthetics and the arts. This liveliness is reflected in some of the empirical challenges that have emerged recently, the resolution of which will likely motivate much research in the field for the foreseeable future. To understand the sources of these challenges and to suggest ways for their resolution, it is necessary to take stock of the history of empirical aesthetics to examine the contributions of major trends in thinking to our current models of how the mind creates aesthetic and artistic products, and how it goes about interacting with them. Of necessity, this historical overview will be selective, focusing on only major thinkers and trends (for more detailed reviews of various epochs see Beebe-Center, 1932; Cupchik, 1986; Konečni, 2012; Martindale, 2007a; Silvia, 2012). This will afford us greater opportunity to discuss the relevance of historically influential ideas to modern thinking.

Prior to embarking on a historical analysis of major trends and their subsequent effects on contemporary empirical aesthetics, a few points must be clarified. The first point involves the interplay between *science of aesthetics* and *science of art* (see Brown and Dissanayake, 2009; Bullot and Reber, 2013). It has been pointed out correctly that these concepts are dissociable, although they clearly overlap in research and practice. It would not be too much of a stretch to argue that any science of art will be incomplete without including an explanation of the aesthetic components of how a viewer interacts with artworks as well as how a creator communicates information to the viewer. Similarly, although aesthetic interactions with non-art stimuli are commonplace, any comprehensive science of aesthetics would be incomplete if it were to lack an explanation of the ways in which aesthetic processes mediate our interactions with artworks. Explicitly highlighting the difference but also the interrelatedness of these two concepts is important because, as our historical overview will demonstrate, they have often been viewed in tandem.

Of course, this is not uniquely a feature of empirical approaches to aesthetics and art by psychologists. For example, the philosopher Jerrold Levinson (2005) has defined aesthetics as "the branch of philosophy devoted to conceptual and theoretical inquiry into art and aesthetic experience" (p. 4). This definition reveals that art appears to be a natural target domain when people think about aesthetics. Nevertheless, it is important to keep open the possibility that the rules that govern

the science of aesthetics may not be necessarily isomorphic with the rules that govern the science of art.

Second, and related to the point above, is what is meant precisely by an *aesthetic experience* – the primary focus of the present chapter. This question can be approached from a number of perspectives. Jacobsen (2006) has argued that the term "aesthetics" has two clusters of meaning associated with it. The first cluster denotes the process of sensation. This sensory-oriented understanding of an aesthetic experience played a dominant role in early empirical aesthetics, especially within the psychophysical approach (see below). The second cluster of meaning is related to the arts. For example, Jacobsen *et al*. (2004) collected word associations for the term "aesthetics" from a sample of German non-artists. The associate "beautiful" was given by greater than 90 percent of the sample, followed by "ugly" at about 50 percent. All other associates were markedly less frequent. This suggests that in most laypeople, contemplating the notion of aesthetics readily evokes the notion of beauty – a concept of focal interest in art history as well as philosophical and psychological aesthetics (Scruton, 2009). In addition to beauty, the greater conceptual system includes such terms as "harmony," "elegance" and "balance," among others. Jacobsen (2006) used this organizational scheme to argue that "aesthetic processing is sensation-based evaluation of an entity with respect to the above conceptual system, primarily the beauty dimension" (p. 158). This suggests that if one were to have a sensory-based evaluation (of beauty), the experience would qualify as *aesthetic*. In contrast, if one were to have a memory-based evaluation (of beauty), it would not. In this sense Jacobsen's (2006) definition is useful because it allows one to distinguish between artistic judgments that are aesthetic versus those that are not.

However, it is also true in our contemporary culture that beauty has a diminished role as a central organizing theme in aesthetic experience. In fact, because aesthetic experiences could potentially involve a host of "unusual" emotions normally not associated with intense experience of beauty (i.e., awe) – such as disgust, anger and confusion (Silvia, 2009) – one might seek a conceptualization of aesthetic experience not centered on beauty per se. For example, for an experience to qualify as an aesthetic experience it might be sufficient that it be object oriented, embody some level of intensity and be relatively coherent and complete (Hospers, 1982, see also Boselie, 1991). I believe that Jacobsen's (2006) definition of aesthetic experience is satisfactory as long as it is broadened to include concepts other than beauty that are nevertheless relevant to the creator or perceiver of the object. This will afford it sufficient flexibility to account for individual differences in the concepts that provide the evaluative reference point for the perceiver and the creator of objects.

Third, having brushed up against neurological (e.g., Chatterjee, 2004), evolutionary (e.g., Nadal *et al*., 2009), comparative (e.g., Hawley-Dolan and Winner, 2011) and neuroscientific (Skov and Vartanian, 2009) approaches, the psychological approach to art and aesthetics has been informed by ideas that have now become a standard part of our discipline's toolkit for examining the mind of the

creator and the viewer. Because those approaches have been discussed at length elsewhere in the present volume, I shall not enter into any substantive discussion of their findings here. However, it is important to bear in mind that despite being strongly influenced by experimental psychology, contemporary empirical aesthetics has been enriched by ideas and critical insights from allied disciplines, in particular philosophy and more recently the neurosciences.

What are the challenges?

Prior to conducting a historical review of the major players and their ideas, I think it would be useful to foreshadow what I consider to be the two major challenges in the field, to which we shall return at the end of this chapter. They are stated at the beginning to contextualize the content of the historical review. First, it will become evident that historically the majority of work in empirical aesthetics has been devoted to the discovery of a finite set of universal laws that govern people's interactions with objects. Taking the visual arts as an example, the aim has been to offer explanations of how "the eye organizes visual material according to definite psychological laws" (Arnheim, 1969). However, fairly early on and in response to theories proposed by Fechner (1876) and Berlyne (1971), among others, criticism arose that this universal approach was insufficient for capturing individual differences apparent in interactions with artworks (see Cupchik, 1986). By and large, this criticism was voiced not internally from among experimental psychologists, but externally from the humanities. The crux of the argument involves whether the combination of a finite set of universal and ahistorical laws is sufficient for accounting for subjective aesthetic and artistic experience. The tension between universal and contextual approaches to aesthetic and artistic experience has reemerged recently as an important issue in the field (see Bullot and Reber, 2013; Silvia, 2012), the resolution of which will surely be a key driver of research in the immediate future.

The second challenge involves a pervasive disconnect between theories and evidence related to the creation versus the perception of art and other aesthetic products. In other words, although creation and perception appear to represent two sides of the same coin, more often than not theories that are proposed and tested to investigate the bases of artistic creativity do not map onto theories and data available on the reception of art. This situation has very slowly begun to change. For example, the neuroscientist Semir Zeki, the founder of the field of neuroaesthetics, has explicitly considered the ways in which visual artists, acting as naïve neuroscientists, influence the appreciation of their work by manipulating the visual systems of viewers (Zeki, 1999; see also Cavanagh, 2005). In psychology, Martindale (2001, 2007b) proposed a neural network theory in which the cognitive processes for the creation and perception of beauty are isomorphic. More recently, Tinio (2013) has proposed an elegant theory to link the steps involved in the creation and reception of art. Nevertheless, tensions

continue to exist in bridging the gap between our theories of artistic creativity and perception, the resolution of which will likely require substantial modification of theories on both sides.

Having briefly outlined what I believe to be the two main challenges in contemporary empirical aesthetics, I shall now turn to an overview of four theories of aesthetic experience that have historically cast a large shadow over the field: Fechner's (1876) psychophysical theory, Arnheim's (1969) Gestalt theory, Berlyne's (1971) psychobiological theory and Martindale's (2001, 2007b) neural network (connectionist) theory. It is important to note that although each theory is associated primarily with a single person, in reality Arnheim's, Berlyne's and Martindale's theories represent a family of approaches that enjoyed contributions from multiple researchers. Although an exhaustive historical overview of the field would have to touch on several additional theoretical contributors, it can be argued that the research tradition in empirical aesthetics has been influenced primarily by these four major thinkers (and related contributors).

Following the conclusion of this historical overview, I will discuss three contemporary models of aesthetic experience motivating research in the field: Reber, Schwartz and Winkielman's (2004) model of processing fluency; Leder, Belke, Oeberst and Augustin's (2004) model of aesthetic experience; and Jacobsen's framework for the psychology of aesthetics (2006, 2010). They each represent a selective synthesis of prior research in empirical aesthetics. Reber *et al*. offer a parsimonious account of aesthetic experience based on a single mechanism. In contrast, Leder *et al*. offer an information processing account of the cognitive and emotional processing stages that lead to an aesthetic experience. Both models are alike in the sense that they both provide explanations of how aesthetic experiences arise. In contrast, Jacobsen offers a multilevel model according to which aesthetic appreciation can be fully characterized.

Fechner's psychophysical theory

There is widespread consensus that the publication of Gustav Theodor Fechner's (1876) *Vorschule der Äesthetik* marks the beginning of the field of psychological aesthetics. As a psychophysicist, Fechner worked under the assumption that there is a correspondence between the physical properties of stimuli and the sensations they cause. It is important to emphasize that in Fechner's time, there was no possibility to directly observe the neural processes that mediate the relationship between variations in physical properties of stimuli and their psychological consequences (e.g., sensations). Nevertheless, cognizant of the role they play in the mechanisms he was trying to unearth, he distinguished between *outer psychophysics*, which involve the relationship between variations in physical properties of stimuli and the sensations they cause, and *inner psychophysics*, which involve the relationship between those sensations

and the neural activities that underlie them. In this sense, he was truly ahead of his time by anticipating one of the main goals of modern neuroscience, which is the establishment of correlations between neural and perceptual processes (Ehrenstein and Ehrenstein, 1999).

Although Fechner had already described his three famous psychophysical methods of investigation in 1871, it was in his seminal 1876 volume that he described the results of experiments he had conducted using those methods to test the veracity of the Golden Section hypothesis. The first was the *method of choice*, which involved choosing among a number of alternatives considered most agreeable or disagreeable. The second was the *method of production*, which involved instructing subjects to create an object that has features or properties that are deemed most agreeable or disagreeable. The third was the *method of use*, which involved an examination of pre-existing objects, by the experimenter, to determine whether they conformed to specific hypotheses of interest. As a testament to Fechner's legacy, these three methods have been foundational and remain widely used by researchers in empirical aesthetics. In fact, one would be hard pressed to find another researcher whose methodological contributions to the field have been comparable, let alone greater.

Aside from introducing key methods for empirical studies of aesthetics, Fechner also introduced important topics of inquiry into the field. I shall focus on two phenomena here. The first involves the *Golden Section hypothesis*, according to which a proportion approximately equal to 0.618 occupies a special position in determining perceptions of beauty. Using rectangles, and later ellipses, to test the Golden Ratio, Fechner was able to offer some evidence for greater preference for it, although he was unable to explain why people prefer it. Since Fechner's initial foray into this topic, numerous researchers have investigated the veracity of this hypothesis. Although reviews of the work on the Golden Section have revealed some evidence supporting it, the effect has also been shown to be extremely susceptible to methodological considerations (see Green, 1995; Höge, 1987). In the 1980s, important work based on mathematical arguments suggested that empirical evidence generated in favor of or against the Golden Section hypothesis was likely based on mathematical artifacts (Fischler, 1981; Fowler, 1993). In an important recent contribution to this literature, Green (2012) used computer simulations to show that those mathematical arguments claiming the effect to be an artifact were themselves based on the erroneous assumption that distributions of the ratios of random objects take on the same shape as distributions of the objects themselves.

However, recently, Konečni (2012) presented a careful analysis of the available empirical evidence related to the Golden Section hypothesis as well as an examination of the historical approaches related to assessing it. He concluded that the use of this proportion in composition is subtle but detectable. In other words, although it is unlikely that the Golden Section will emerge as a single factor determining composition and preference for it, it appears to have a subtle role to play within contextualized application in composition.