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Editorial

Aesthetic perception: A naturalistic turn

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Aesthetic perception has been a widely discussed issue since ancient times; multiple theories still contend today. Historically, art and beauty have been the subjects of interest of aesthetic perception, and the whole scene has been dominated by two big questions. The first one concerns whether beauty is a concept that belongs to reality, a question that comes with several related implications concerning the search for universal qualities of beauty, while the second one concerns the comprehension of the nature and the purpose of art (García-Prieto, Pereda, & Maestú, 2016). It is thus not surprising that most of the studies and theoretical works relate the perception of the aesthetic to the perception of art and of beauty.

Over the last decades, philosophers, psychological theorists, and empirical researchers in such fields as cognitive psychology, neuroscience, and interaction design have shown interest in explaining how agents are attracted, or fail to be attracted to objects, events, and other agents. However, few studies in these fields challenge the traditional separation of aesthetic from non-aesthetic, thereby calling for a naturalization of aesthetics as a revised conception of aesthetic processing that is more biological and adaptive in scope. These studies support the idea that aesthetic perception is not necessarily confined to interactions with artworks but perceptual experience is extended to interactions that include natural objects or phenomena, designed artifacts and/or other individuals (Cattaneo et al., 2013). Such neurobiological studies are backed up from an increasing number of studies in experimental aesthetics showing that aesthetic perception is a multimodal function that it is not restricted to art or artistic expressions or qualities, properties or elements of a thing (Hekkert & Leder, 2007). In the same direction, an increasing number of human neuroimaging studies is showing that the brain areas that mediate aesthetic responses to art overlap those that mediate the appraisal of objects of evolutionary importance, (e.g. the desirability of food items or the attractiveness of potential mates, etc.) (Brown, Gao, Tisdelle, Eickhoff, &

Liotti, 2011). Moreover, contemporary philosophical works argue that aesthetic experience is neither necessary nor sufficient for the experience of art. People can interact with art in a non-aesthetic manner while they can interact with everyday objects in an aesthetic manner (Nanay, 2014).

The brave turn from beauty and art to a wider range of interactions in the study of the aesthetic has not prevented several studies in neuroaesthetics and empirical aesthetics from focusing quite narrowly on an intuitive notion of formal aesthetic qualities. Several works in these areas of research are still following the philosophical tradition that aesthetic objects intrinsically carry a certain function: to provoke an aesthetic form of response, i.e., to transmit information that evokes an aesthetic interest or experience (see e.g., Ingarden, 1961; Lind, 1980). Such research works mostly aim at measuring psychological responses to physical properties that are in some way related to the aesthetic quality of the object. And although it is hard to generalize such responses and the respective aesthetic principles into a universal aesthetic theory (Seeley, 2013), several works investigate people's tendency to prefer such principles. Principles such as balance, symmetry, complexity, variety, unity, familiarity, originality, novelty, typicality, arousal, ambiguity and innovativeness rooted in human evolution are among those claimed to be providing a basis in the development of aesthetic perception. The claim is that such 'inner tendencies' guide individuals to look for these unifying properties in their environments so as to better support their actions, and accordingly, artists and designers should try to consider these principles in their empirical and practical methods in order to incorporate the 'aesthetic' into their artifacts (Blijlevens, Carbon, Mugge, & Schoormans, 2012; Hekkert & Leder, 2007; Muth, Hesslinger, & Carbon, 2015).

Despite the vast number of such property-based and object-oriented studies that attempt to investigate the aesthetic and provide explanations of how individuals are attracted to things, what they see in those things during an aesthetic experience, and how the aesthetic is represented in said things, the problem is not resolved. In particular, the conditions under which aesthetic perception occurs, and what constitutes the content of these perceptions remains a black box for aesthetic science. The major problem is not the method for investigating and testing the phenomenon (of the aesthetic) but the different and even incompatible conceptions of the phenomenon that scientists accept (Bergeron & Lopes, 2012). The lack of an accepted model that explains and describes the constitutive parts of the aesthetic prevents scientists from grounding aesthetic perception in specific psychological and/or biological functions (Redies, 2007; Skov, 2009).

In this direction, several pertinent questions, such as 'how stimuli is linked to aesthetic experience, and what factors determine a

pleasing visual experience' (Vessel, Stahl, Maurer, Denker, & Starr, 2014), or 'when our cognitive background (beliefs or states) determines a pleasing visual experience' (Stokes, 2014) and 'under which circumstances novices and experts in aesthetic matters perceive the world differently' (Seeley & Kozbelt, 2008) are repeatedly being asked. Also, independently of an object-based or a (more) internalist approach, several studies by neuroscientists and cognitive psychologists have concluded that aesthetic behavior incorporates emotional valuations and actions engendered by these objects as well as processes that underlie such emotional interpretation and production (Chatterjee & Vartanian, 2014). In addition, while traditionally aesthetics has focused exclusively on the positive-valence assessments of beauty, aesthetic evaluation is now approached as a binary phenomenon, with both positive and negative components. In this way, our aesthetic feelings become major factors in guiding attention, motivation and meaning making (see e.g., Brown et al., 2011; Xenakis & Arnellos, 2015).

Taken together, these considerations have recently led to a wider consensus that traditional problems in aesthetics are in fact to be considered under the wider umbrella of the philosophy of perception (see e.g., Nanay, 2016). Accordingly, aesthetic 'processing', at its core, should be considered as a perceptual evaluative process. The investigation and understanding of aesthetic perception like any other natural process characteristic of living organisms could provide a different meaning to aesthetic interactions that challenges the philosophical tradition of aesthetics as merely a 'theory of value'. In consequence, considering the function of affective feelings in perception may deepen the naturalistic explanation of aesthetic perception, and studies of aesthetic phenomena may be generalized to wider areas of life (Brown et al., 2011; Dissanayake, 2015; Xenakis & Arnellos, 2013, 2014).

This is exactly the aim of our special issue: it is a collection of works from various scholars of the field expressing their views and perspectives on aesthetic perception, its content, and the conditions (biological, cognitive, and social) under which it takes place, as well as on art-centered versus embodied aesthetics. There are both theoretical and empirical contributions from researchers working in the domains of neuroscience, interaction design, and theoretical and philosophical psychology.

From the neuroscientific/neurobiological camp there are two contributions. Stefania Righi and colleagues explore the temporal dynamics of aesthetic experience that result from the interplay of emotional value with perceptual and other cognitive factors such as attention, decision-making, and action selection. They suggest that depending on the aesthetic evaluation, the aesthetic experience can shape cognitive and emotional processes in different ways. Edmund Rolls discusses some neurobiological foundations of aesthetics and art, rooting his account, on the one hand, in gene-based value systems for emotion and motivation, while on the other hand he acknowledges the need for a value system for reasoning in the interests of the individual agent, thus providing an approach to understanding aesthetics that is grounded in evolution and its effects on brain design and function.

There are two contributions from interactive design and human-computer interaction. Michaël Berghman and Paul Hekkert test Hekkert's unified model of aesthetic pleasure in design by empirically integrating the three principles of 'unity-in-variety', 'most-advanced-yet-acceptable' and 'autonomous-yet-connected' and measuring both their independent and joint impact on aesthetic pleasure. Eva Lenz, Marc Hassenzahl, and Sarah Diefenbach suggest that interaction attributes are linked to experiential qualities. They present an experimental laboratory study according to which agents feel "better" about an interaction if the sensorimotoric level (the How) of this interaction "expresses" the intended experience (the Why), while the authors investigate relationships

between interaction attributes, affective experience and need fulfilment.

There are six theoretico-philosophical contributions. Ann-Sophie Barwich discusses aesthetic perception as a decision-making process in the context of neuroaesthetics. By integrating recent studies of the neural basis of smell with perceptual insights from perfumery she argues in favor of *cognitive penetration* in odor perception, according to which perceptual discrimination is subject to learning and directed attention. On the contrary, Daniel Burnston attempts to invalidate what he calls the 'scaling argument' (the claim that the more high-level, categorical, socially-mediated, and learning-dependent a percept is, the more likely it is to be the result of cognitive penetration) and he argues instead that given the best empirical and theoretical picture of how perception and perceptual learning work cognitive penetration is not required to explain what goes on in aesthetic perception. Thomas Jacobsen and Susan Beudt discuss the interplay of domain specificity and domain generality in aesthetic appreciation. They argue for strong evidence for domain specificity based on the mental processing architecture of the sensory modalities, while these domain-specific processing employ many mental processes that are also engaged in non-aesthetic processing like, for instance, emotion regulation or judgment and decision-making, in general. Aaron Kozbelt discusses the creative dynamic in which long-term pressure for novelty leads to inexorable tensions with canalized aesthetic biases. He argues that universals for aesthetic reception have plausibly arisen from evolutionary pressures, but the role those universals play in the creation of high-level aesthetic novelty is less clear. He suggests that quantitative and *trans*-historical studies of recent art can elucidate these issues centered on the relative value of novelty versus adaptive value in aesthetic creativity. Pentti Määttänen proposes a naturalistic notion of aesthetic perception based on a pragmatic notion of habit and action. He takes any object of perception to enable a view of values and emotions in case some habits are involved, and thereby those habits function as a complex system of meanings within which aesthetic perception is interpreted and its dimensions are explained. Ioannis Xenakis and Argyris Arnellos propose a naturalist-realist perspective on aesthetic perception, which is considered an evaluative form of behavior that identifies, evaluates, and compares sources of interaction-success or error with the environment. Since such evaluative behavior is based on regulatory processes that construct anticipatory contents in the form of feelings regarding opportunities for interaction, the related model emphasizes the self-directedness of aesthetic behavior over its determination to any pre-given aesthetic quality.

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