The Artful Mind Meets Art History: Toward a Psycho-Historical Framework for the Science of Art Appreciation

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Abstract: Research seeking a scientific foundation for the theory of art appreciation has raised controversies at the intersection of the social and cognitive sciences. Though equally relevant to a scientific inquiry into art appreciation, psychological and historical approaches to art developed independently and lack a common core of theoretical principles. Historicists argue that psychological and brain sciences ignore the fact that artworks are artifacts produced and appreciated in the context of unique historical situations and artistic intentions. After revealing flaws in the psychological approach, we introduce a *psycho-historical framework for the science of art appreciation*. This framework demonstrates that a science of art appreciation must investigate how appreciators process causal and historical information to classify and explain their psychological responses to art. Expanding on research about the cognition of artifacts, we identify three modes of appreciation: *basic exposure* to an artwork, the *artistic design stance*, and *artistic understanding*. The artistic design stance, a requisite for artistic understanding, is an attitude whereby appreciators develop their sensitivity to art-historical contexts by means of inquiries into the making, authorship, and functions of artworks. We defend and illustrate the psycho-historical framework with an analysis of existing studies on art appreciation in empirical aesthetics. Finally, we argue that the fluency theory of aesthetic pleasure can be amended to meet the requirements of the framework. We conclude that scientists can tackle fundamental questions about the nature and appreciation of art within the psycho-historical framework.

Key Words: Art appreciation; causal reasoning; cognitive tracking; cognition of artifacts; design stance; essentialism; function; history of art; mindreading; processing fluency; psycho-historical framework

Does the study of the mind's inner life provide a theoretical foundation for a science of art? Scientists in empirical aesthetics and the neuroaesthetics think so. They adhere to what we, along with Pickford (1972), call the *psychological approach* to art, which uses methods of psychology and neuroscience to study art and its appreciation. Due to its focus on the mind's processes and the brain's internal structures, psychological research often ignores the *historical approach* to art, which focuses on the role of historical contexts in the making and appreciation of works of art. The psychological and historical approaches have developed conflicting research programs in the study of art appreciation and art in general. They offer diverging accounts of the degree to which historical knowledge is involved in art appreciation. After introducing the debate between these two traditions, we propose in Sections 2 and 3 a psycho-historical framework that unifies psychological and historical inquiries into art appreciation. We argue that art-historical contexts, which encompass historical events, artists' actions, and mental processes, leave causal information in each work of art. The processing of this information by human *appreciators*[i] includes at least three distinct modes of art appreciation: basic exposure of appreciators to the work; causal reasoning resulting from an 'artistic design stance'; and artistic understanding of the work based on knowledge of the art-historical context. In Section 4, we demonstrate that empirical research within the framework is feasible. Finally, we describe in Section 5 how an existing psychological theory, the processing-fluency theory of aesthetic pleasure, can be combined with the psycho-historical framework to examine how appreciation depends on context-specific manipulations of fluency.

1. The controversial quest for a science of art appreciation

The quest for an empirical foundation for the science of art appreciation has raised controversies across the humanities and the cognitive and social sciences. Although the psychological and historical approaches are equally relevant to a science of art, they have developed independently, and continue to lack common core principles.

1.1. The psychological approach to art appreciation

The *psychological approach* to art aims to analyze the mental and neural processes involved in the production and appreciation of artworks. Early work by psychologists focused on how physiology and psychology may contribute to a scientific approach to aesthetic and artistic preferences (Bullough, 1957; Fechner, 1876; Helmholtz, 1863; Martin, 1906; Pratt, 1961). The field of *empirical aesthetics* originates from this tradition (Berlyne, 1971; Martindale, 1984, 1990; Pickford, 1972; Shimamura & Palmer, 2012).

Research in neuroaesthetics is a recent and more radical branch of the psychological approach (Chatterjee, 2010; Skov & Vartanian, 2009). The term *neuroaesthetics* was coined by Zeki who viewed it as 'a neurology of aesthetics' that provides 'an understanding of the biological basis of aesthetic experience' (Zeki, 1999: p. 2). With regard to the relation to art history, research in the psychology of art does not essentially differ from neuroaesthetics. Like neuroscientists, psychologists think that the appreciation of art depends on internal mechanisms that reflect the cognitive architecture of the human mind (Kreitler & Kreitler, 1972; Leder, Belke, Oeberst, & Augustin, 2004), or of its components such as vision (Solso, 1994; Zeki, 1999) and auditory processing (Peretz, 2006; Peretz & Coltheart, 2003). Like neuroscientists, psychologists present artworks as 'stimuli' in their experiments (Locher, 2012). Their methodologies usually differ in that neuroscientists measure brain activation whereas psychologists analyze behavioral responses. Both traditions are, however, dominated by the psychological approach understood as an attempt to analyze the mental and neural processes involved in the appreciation of artworks.

Many contemporary thinkers distinguish art appreciation from aesthetic experience broadly understood (Berlyne, 1971; Danto, 1974, 2003; S. Davies, 2006; Goodman, 1968; Norman, 1988; Tooby & Cosmides, 2001). In contrast to them, advocates of neuroaesthetics maintain that art

'obeys' the aesthetic 'laws of the brain' (Zeki, 1999; Zeki & Lamb, 1994). Like evolutionary accounts of art (Dutton, 2005, 2009; Pinker, 2002; Tooby & Cosmides, 2001), their research is aimed at discovering principles that explain both aesthetic and artistic universals. For instance, drawing a comparison with the concept of universal grammar (Chomsky, 1966), Ramachandran (2001: p. 11; Ramachandran & Hirstein, 1999) defends the universalistic hypothesis that 'deep' neurobiological laws cause aesthetic preferences and the appreciation of a work of art.

The search for laws (Martindale, 1990) and universals of art is a chief objective for numerous contributions to the psychological approach (Aiken, 1998; Dutton, 2005; Fodor, 1993: p. 51-3; Peretz, 2006; Pinker, 1997: Chapter 8; 2002: Chapter 20; Zeki, 1999). Among them, Dutton (2005, 2009) and Pinker (2002) argue that there are universal signatures of art, such as virtuosity, pleasure, style, creativity, special focus, and imaginative experience. Pinker even defends the ostensibly ahistorical conjecture that 'regardless of what lies behind our instincts for art, those instincts bestow it with a transcendence of time, place, and culture' (Pinker, 2002: p. 408).

Many advocates of the quest for aesthetic or artistic universals distrust the historical methods employed in the humanities (Martindale, 1990; Ramachandran, 2001). Some, like Martindale (1990), have claimed that psychological or neuroscientific methods can discover *laws* of art appreciation without investigating the appreciators' *sensitivity*[ii] to particular art-historical contexts. In contrast to neuroaesthetics, we will argue that the science of art appreciation needs to investigate art appreciators' historical knowledge and integrate historical inquiry and the psychology of art. Our view is derived from contextualist principles introduced by the historical approach, which we discuss next.

1.2 Contextualism and the historical approach to art appreciation

In contrast to the universalism pervasive in the psychological tradition, many scholars advocate a historical approach to the study of art. We use the term *historical approach* to refer to accounts that appeal to appreciators' sensitivity to particular historical contexts and the evolution of such contexts in order to explain art appreciation. We include in the historical approach studies that examine art appreciation from the standpoint of the history of art (Gombrich, 1951 [1950]; Munro, 1968, 1970; Panofsky, 1955; Roskill, 1989 [1976]), the sociology of art-historical contexts (Bourdieu, 1996 [1992]; Hauser, 1951; Heinich, 1996; Tanner, 2003), and art criticism specific to historical situations (Danto, 1998a, 2009; Foster, 2002; Fried, 1998; Greenberg, 1961). A philosophical tradition representative of the historical approach is *aesthetic contextualism* (Currie, 1989; Danto, 1964, 1981; Dickie, 1997 [1984], 2000; Dutton, 1983; Walton, 1970). According to aesthetic contextualism, historical and societal contingencies play an essential role in the production of art and in the appreciation of particular artifacts as works of art (D. Davies, 2004; Gracyk, 2009; Levinson, 1990, 2007). A work of art is the outcome of the causal intervention of human agents, such as artists and curators, embedded in a historical context made of unique unrepeatable events and irreplaceable objects (Benjamin, 2008 [1936]; Bloom, 2010). Contextualists investigate the consequences of this historical embeddedness to account for the identity, appreciation, understanding, and evaluation of works of art. They argue that contextual knowledge of artifacts and their context-specific functions are essential processes in art appreciation.

According to contextualism and the historical approach, the appreciation of an artwork requires that appreciators become sensitive to the art-historical context of this work, including its transmission over time. Since defenders of the psychological approach have usually investigated art appreciation without analyzing the appreciator's sensitivity to art-historical contexts, many contextualists (Currie, 2003, 2004; Dickie, 2000; Gombrich, 2000; Lopes, 2002; Munro, 1951, 1970) doubt that

current psychological and neuroaesthetic theories succeed in explaining art appreciation. In our interpretation, a decisive *contextualist objection* can be outlined as follows:

1. The appreciator's competence in artistic appreciation of a work of art is an informed response to—or *sensitivity to*—the art-historical context of this work (see Section 3).

2. Most psychological and neuroaesthetic theories do not explain the appreciator's sensitivity to the art-historical context of the work (see Sections 1 and 4).

3. Therefore, most psychological and neuroaesthetic theories do not explain the appreciator's artistic appreciation.

In sum, most psychological and neuroaesthetic theories fail to account for artistic appreciation because they lack a model that accounts for the contextual nature of art and of the appreciators' sensitivity to art-historical contexts. Conversely, we will outline such a model in Sections 2 and 3.

The contextualist objection is sound when directed at studies that investigate the neural responses to art without a theory of the neural basis of the sensitivity to art-historical contexts, as in neuroaesthetics. Consider, for example, Andy Warhol's *Brillo Soap Pads Box* (1964). This piece has aesthetic properties that are absent from regular *Brillo* boxes in a supermarket. Since these objects are visually indistinguishable, they are likely to elicit the same kind of activation in the *visual* brain areas of appreciators. The reference to neural responses in visual areas may identify necessary conditions for appreciation through basic exposure (Section 3.1). However, the reference to visual processes does not explain the fact that the appreciators' artistic understanding of the work derives from their sensitivity to its art-historical context (Section 3.3). As contextualists such as Danto (1981, 1998b, 2003) have argued persuasively, a work like Warhol's *Brillo* boxes can only be appreciated *as art* if their audience is sensitive to certain historical facts. Here, facts of relevance

are that Warhol adopted the reflective attitude of artists in his artworld, or that he rejected the separation between fine art and mass culture (Crane, 1989; Danto, 1998b: p.154-5; 2003: p. 3; 2009: Chapter 3). Therefore, a neuroaesthetics of the neural responses to Warhol's *Brillo* boxes must investigate the neural mechanisms that underlie the appreciators' sensitivity to facts in Warhol's art-historical context (Frigg & Howard, 2011). We do not know of any neuroscientific studies that directly examined this question.

This is but one example of the disagreements between the proponents of the psychological and the historical approaches. Since the early attempts to explain art in scientific terms (Fechner, 1876), controversies have been raging about ontological assumptions, methods, and objects of inquiry. As a result of these disagreements, psychologists and neuroscientists often ignore the concepts proposed by historical theories, such as aesthetic contextualism, sometimes simply because they originate from the 'non-scientific' humanities (Martindale, 1990; see Section 4). Reciprocally, only a few art historians (Freedberg, 1989; Freedberg & Gallese, 2007; Gombrich, 1960, 1963, 1979; Stafford, 2007, 2011) and philosophers (Currie, 1995, 2004; Dutton, 2009; Kieran & Lopes, 2006; Lopes, 1996, 2004; Nichols, 2006; Robinson, 1995, 2004, 2005; Scharfstein, 2009; Schellekens & Goldie, 2011) consider psychological findings when discussing art. The separation between psychological and historical approaches is an illustration of the so-called 'two cultures' (Carroll, 2004; Leavis, 1962; McManus, 2006; Snow, 1959), the divide between the sciences and the humanities that our psycho-historical approach seeks to overcome.

2. A psycho-historical framework for the science of art appreciation

In Sections 2 and 3, we introduce a *psycho-historical framework for the science of art appreciation* ('psycho-historical framework' henceforth). This framework expands Bullot's (2009a) research aimed at combining the psychological and historical approaches to a theory of art. Figure 1 depicts

the central concepts of our framework and their relations, namely art-historical context (Section 2.1), the artwork as artifact (Section 2.2) and as carrier of information (Section 2.3), and the appreciation of the work through three modes of information processing (Section 3).
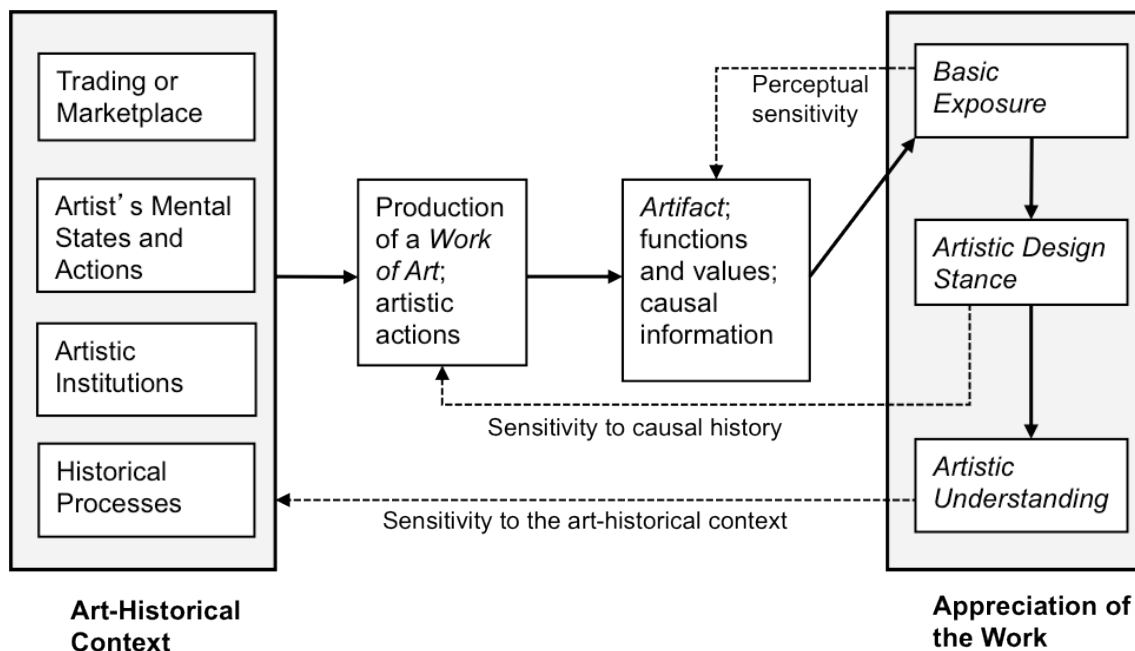
Figure 1 The psycho-historical framework for the science of art appreciation. Solid arrows indicate relations of causal and historical generation. Dashed arrows indicate information-processing and representational states in the appreciator's mind that refer back to earlier historical stages in the production and transmission of a work. Details about the core concepts are provided in the text.

2.1 Art-historical context

As illustrated in Figure 1, *art-historical contexts* include persons, cultural influences, political events, and marketplaces governing the production, evaluation, trade, and conservation of works of art. Artists, patrons, curators, sellers, politicians, and audiences belong here. Contextualist philosophers (Danto, 1964; Dickie, 1997 [1984]) investigate the ontological dependence of artworks on art-historical contexts (artworlds). Since at least Vasari (1991 [1550]), art historians examine art-historical contexts to understand the lives and oeuvres of artists (Guercio, 2006).

Others use sociological methods to explain trends or mechanisms in particular art-historical contexts (Bourdieu, 1987 [1979]; Crane, 1989; Hauser, 1951; Heinich, 1996).

Here, we do not aim to provide a detailed theory of the art-historical context. The psycho-historical framework only requires that researchers agree on two principles about the nature of the art-historical context: First, a work of art is an artifact that has historical functions (Section 2.2). Second, it carries causal-historical information (Section 2.3).

2.2 The work of art as artifact

We use the term *artifact* in a broad sense to refer to an object or a performance intentionally brought into existence through the causal intervention of human action and intentionality (e.g., Hilpinen, 2004; E. Margolis & Laurence, 2007). This concept deviates from the sense of 'artifact' that refers exclusively to manufactured objects. It entails that all artistic performances are artifacts in the sense of being products of human actions.

Artifacts usually have intended functions (Bloom, 1996; Dennett, 1987, 1990; Millikan, 1984; Munro, 1970). Arguably, the function of an artifact is initially specified by its inventor or designer. However, many artifacts acquire additional functions or have their main function abandoned over time. Therefore, reference to the intended function and original context is not sufficient to explain the functions of an artifact (Dennett, 1990; G. Parsons & Carlson, 2008; Preston, 1998). Preston (1998) and Parsons and Carlson (2008: p. 75) propose a way to analyze the function of an artifact without exclusively relying on the intentions of its maker. In their analysis, artifacts of a particular sort have a *proper function* if these artifacts currently exist because their ancestors were successful in meeting some need or want in cultural and trade contexts because they performed this function, leading to production and distribution of artifacts of this sort.

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Though alternative accounts of the relationships between artifacts and functions have been proposed (Grandy, 2007; Sperber, 2007; Vermaas & Houkes, 2003), it is significant that all the proposed accounts need to refer to the *historical context* of artifacts to explain the way they acquire proper or accidental *functions*. Reference to particular historical contexts seems indispensable in explaining the functions of artifacts. It is therefore not surprising that cognitive development and adults' understanding of artifact concepts seems guided by a historical understanding of objects (Gutheil, Bloom, Valderrama, & Freedman, 2004).

With Parsons and Carlson (2008) and in agreement with empirical research on artifact cognition (e.g., Matan & Carey, 2001; see Section 3.2), we propose to apply this historical approach to artifact functions to works of art (understood in the broad sense that refers to both art objects and performances). Since an artwork is a product of human agency with context-dependent functions, assessing the appreciators' understanding of its context-dependent functions is essential to explaining art appreciation (Section 3.3). This premise underlies contextualism (Section 1.2) and a few intentionalist theories of art in art history (Baxandall, 1985), anthropology (Gell, 1998), philosophy (Levinson, 2002; Livingston, 2003; Rollins, 2004; Wollheim, 1980), and psychology (Bloom, 2004, 2010).

2.3 The work as carrier of information

In contrast to ahistorical psychologism, contextualism entails that explaining the appreciator's sensitivity to art-historical contexts is crucial to any account of art appreciation. We argue that this antagonism can be overcome if psychological and neuroscientific theories consider the fact that art appreciation depends on the processing of causal and historical information carried by an artwork, especially information related to its context of production and transmission.

Like Berlyne (1974), we adopt an information-theoretic conception of the work of art and its properties; and thus assume that features of an artwork can be sources of syntactic, cultural, expressive, and semantic information. However, Berlyne's account is misleading because it is *ahistorical*. It overlooks the fact that the information carried by a work is the end product of a causal history, and that appreciators extract information to acquire knowledge about the past of the work. We use the term *causal information* (Bullot, 2011; Dretske, 1988; Godfrey-Smith & Sterelny, 2007; 'natural meaning' in Grice, 1957; Millikan, 2004: p. 33) to denote objective and observer-independent causal relations. A familiar example used to introduce causal information is tree-ring dating. In some tree species, one can draw inferences about age and growth history of a tree specimen from the number and width of its tree rings because ring-related facts carry causal information about growth-related facts (Speer, 2010). In a similar way, features in artworks are carriers of causal information and therefore allow appreciators to acquire knowledge about facts from the past.

As depicted in Figure 1, any work of art carries causal information. This phenomenon can be illustrated by the slashed paintings made by Lucio Fontana (Freedberg & Gallese, 2007; Whitfield, 2000). The fact *that there is a cut in the canvas of this painting by Fontana* is evidence of the elapsed fact *that Fontana is slashing the canvas* because the former carries information about the causation of the latter. Knowledge of the causal link between the two facts is essential in order to authenticate that the work was made by Fontana and is not an act of vandalism or a forgery (Section 3.3). Similarly, music or dance performances and works of poetry carry causal information. For instance, the actions of dancers performing choreographies by Pina Bausch carry information about the decisions made by the choreographer while planning the performance.

It is often possible to retrieve from an artwork its connections to antecedent events because certain causal or lawful processes at the time of its creation or transmission preserve certain properties

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(e.g., Fontana's slashing the canvas with a knife caused the cut in the canvas, and this cut was preserved over time). Works also carry information about events after its initial production, like the translation of a poem written in Middle English into Modern English, or Mendelssohn's decisions in his performance of Bach's St Matthew Passion in 1829 (Haskell, 1996). Crucially, one can study such causal information in each particular artifact to infer its history, as illustrated above with the example of tree rings.

The historical study of artifacts always requires investigation into causal information to resolve a problem of *reverse engineering* (Chikofsky & Cross, 1990; Rekoff, 1985) in the interpretation of causal information: How can one infer the properties of an object's history or the intentions of the producer from the features one perceives in the object? In the specific case of artworks, we will argue that this problem can only be resolved when one adopts the 'artistic design stance' (Section 3.2).

Although the features of artworks can be the outcome of deliberate actions performed by an intentional agent, such as Fontana or Bausch, much of the causal information carried by a work is the outcome of processes that are not products of intentional actions. For example, Pollock intentionally made his movements in order to cast paint on the canvas of *Number 14: Gray* in specific patterns. The time and effort he invested in planning and performing his seemingly accidental paintings contributed to the making of his artistic stature (Kruger, Wirtz, Van Boven, & Altermatt, 2004; Steinberg, 1998 [1952]). However, the distribution of paint in his painting also carries causal information about physical or physiological constraints that led to outcomes not intentionally planned by Pollock.

Causal-historical information is fundamental to the unification of the psychological and historical approach because it is the missing link between the history of an artwork and its appreciation (Bullot, 2009a). This linkage has been overlooked by most theories in the two traditions.

2.4 The neglect of art-historical contexts by psychology

Some proponents of the psychological approach (Fodor, 1993; Ramachandran, 2001) claim that sensitivity to art-historical contexts is not a requisite of art appreciation and art understanding (see Section 1.1). Other advocates of the psychological approach do not explicitly deny the historical nature of the artistic context and of artistic actions. However, they usually do not offer proper theoretical and methodological consideration of the role of the appreciators' knowledge of art-historical contexts (Section 4).[iii]

This oversight of the sensitivity to art-historical contexts persists despite research demonstrating the role of causal-historical knowledge and essentialist assumptions in the categorization of artifacts (Bloom, 1996, 2004, 2010; Kelemen & Carey, 2007; Newman & Bloom, in press), and despite the greater importance experts give to historical contexts in art appraisal compared to novices (Csikszentmihalyi & Robinson, 1990; M. L. Parsons, 1987). Some of the most radical historicists (B. Gopnik, 2012; J. Margolis, 1980, 2000) have concluded from this oversight that psychological research is irrelevant in principle to the theory of art appreciation. To rebut these objections, psychological theories must address the contextualist objections and examine the links between art-historical context and appreciation of an artwork.

Basic Exposure to the Work

▪ *Perceptual representation* and *attentional tracking* of observable features of the work (e.g., its shape, colors, tones, duration)   ▪ Basic *syntactic and semantic processing* of symbols and narrative structures   ▪ *Implicit learning* of regularities (e.g., styles); anticipations based on probabilistic learning   ▪ Automatic *elicitation of emotions*   ▪ Prompting of *pretense* and *mindreading*

Modes of Appreciation

- Basic Exposure
- Design Stance
- Artistic Understanding

Design Stance about the Work and its Context

▪ *Causal reasoning* about observable features and causal attributions (derived from essentialist assumptions)   ▪ *Identification, localization, and genealogy* of the work and the agents and actions that caused the production of the work   ▪ *Mindreading of the mental states of agents in the art-historical context*; re-enactment of certain mental states

Artistic Understanding of the Work

▪ *Theory-based reasoning* about the content, form, and functions of the work and the causal information it carries (e.g., theory-based classification of styles)   ▪ *Emotions elicited by epistemic processes* in the appreciator's discovery of the contextual functions and the art-historical context   ▪ *Appreciation of look-alikes and forgeries* based on the historical tracking of the work and its art-historical context

Figure 2. The three modes of appreciation of a work of art posited by the psycho-historical framework. Solid arrows depict necessary conditions. Dashed arrows specify typical mental activities elicited by each mode.

3. Three modes of art appreciation

A work of art carries causal information about art-historical contexts. When appreciators perceive a work, they are exposed to such causal-historical information. This exposure may lead appreciators to develop their sensitivity to related art-historical contexts and deepen their understanding of the making, authorship, content, and functions of the work. Appreciators of a work can process the information it carries in at least three distinct ways (see boxes and dashed arrows on the right-hand side of Figure 1), through three modes of art appreciation (Figure 2).

First, appreciators can extract information about the work by drawing their attention to its observable features in *basic exposure* (Section 3.1). Second, once exposed to an artwork, appreciators may adopt the *artistic design stance*, which triggers interpretations of the causal information carried by the work (Section 3.2). Taking the design stance enables appreciators to acquire *artistic understanding* derived from knowledge of the art-historical context (Section 3.3). As depicted by the solid arrows in Figure 2, exposure to a work is a necessary condition for adopting the artistic design stance, and taking the design stance is necessary for artistic understanding.

3.1 Basic Exposure

An elementary mode of appreciation is *basic exposure* to the work or one of its reproductions. Basic exposure is the set of mental processes triggered by perceptual exploration of an artwork without knowledge about its causal history and art-historical context. Perceptual exploration employs a variety of processes necessary to appreciation that we will not discuss here (Figure 2).[iv] Instead, we outline basic principles and focus on three processes that play a key role in our justification of the psycho-historical framework: the implicit learning of regularities; the elicitation of emotions; and pretense. Such processes may elicit cognitive analysis of artwork content and aesthetic pleasures. But they do not provide appreciators with explicit knowledge of the links between the work and its original art-historical context.

Implicit learning of regularities and expectations. Since artworks carry causal-historical information, repeated exposure to a work may nonetheless allow its appreciators to implicitly develop their sensitivity to historical facts or rules, even if such appreciators are deprived of knowledge about the original art-historical context. For instance, exposure to musical works leads listeners without formal expertise in music to acquire an ability for perceiving sophisticated

properties such as the relationships between a theme and its variations, musical tensions and relaxations, or the emotional content of a piece (Bigand & Poulin-Charronnat, 2006).

Perceptual exposure to an artwork leads to types of implicit learning that may occur even if the learner does not possess any explicit knowledge about the history of the work. Consider style. Stylistic traits indicative of a particular artist, school, or period are important features of artworks that connects form and function (Carroll, 1999: Chapter 3; Goodman, 1978: Chapter 2). The classification of artworks according to their style is an important skill in art expertise (Leder, et al., 2004; Munro, 1970; Wölfflin, 1950 [1920]). Machotka (1966) and Gardner (1970) observed that young children classify paintings according to the represented content whereas older children begin to classify paintings according to style. However, there is reason to doubt that artistic understanding is a requisite of basic stylistic classifications because one study suggested that even pigeons can learn to classify artworks according to stylistic features (Watanabe, Sakamoto, & Wakita, 1995), and we do not know of any evidence for artistic understanding in pigeons. This indicates that basic style discrimination stems from probabilistic learning that does not require an understanding of the processes that underlie styles of individual artists (Goodman, 1978) or historical schools and periods (Arnheim, 1981; Munro, 1970; Panofsky, 1995; Wölfflin, 1950 [1920]). Such understanding is more likely to derive from inferences based on historical theories rather than similarity (Section 3.3).

Automatic elicitation of emotions. The sensory exposure to form and content of a work of art can elicit a variety of automatic emotional responses (Ducasse, 1964; Peretz, 2006; Robinson, 1995, 2005). These may include the emotions that are sometimes described as *basic* (Ekman, 1992) or *primary* (Damasio, 1994)—such as anger, fear (Robinson, 1995; Walton, 1978), disgust, and sadness—and other basic responses such as startle, erotic desire (Freedberg, 1989), enjoyment, or feeling of empathetic engagement (Freedberg & Gallese, 2007). The historical knowledge that

appreciators gain from the elicitation of these basic emotions through basic exposure to a work is shallow at best.

Prompting of pretense and mindreading. The appreciator's perception of the work can prompt processes aimed at representing mental states, so-called *mindreading* (Carruthers, 2009; Nichols & Stich, 2003). Most empirical evidence about mindreading comes from research on child development (Bartsch & Wellman, 1995; Wellman, 1990) and cognitive evolution (Premack & Woodruff, 1978; Sterelny, 2003; Whiten & Byrne, 1997). To our knowledge, mindreading in art appreciation has not been an object of research in empirical aesthetics and neuroaesthetics. In contrast, philosophical arguments by Walton (1990), Currie (1990, 1995), Schaeffer (1999), Gendler (2000, 2006), and Nichols (2006) provide reason to think that mindreading and imagination are essential to art appreciation. For a work of art can prompt free imaginative games and pretense involving the attribution of fictional beliefs or desires to characters. These games often are stunning constructions of imagination (Harris, 2000; Nichols & Stich, 2003), and need no sensitivity to the causal history of artworks.

When watching fictitious battle scenes in an antiwar movie, viewers ignorant of its intended antiwar function may imagine themselves as military heroes and enact pretend-plays that ascribe pretend military-functions to objects (e.g., pretend that a cane has the function of a gun). These appreciators may experience imaginative contagion, the phenomenon that imagined content may facilitate thoughts and behaviors, here pretend-plays (Gendler, 2006). The viewers are exposed to the movie, discriminate between fictional worlds (Skolnick & Bloom, 2006), ascribe fictional intentions to their enemies, experience fear or 'quasi-fear' (Meskin & Weinberg, 2003; Walton, 1978), and do not conflate fiction and reality (Currie & Ravenscroft, 2003; Harris, 2000; Nichols & Stich, 2003). However, their responses to the work are not sensitive to the original art-historical context because of their ignorance of the anti-war function originally intended. We therefore must distinguish the

engagement of mindreading in basic exposure from its engagement in inquiries about art-historical contexts (Section 3.2).

Basic exposure to artworks is the mode of appreciation most frequently studied by empirical aesthetics and neuroaesthetics. However, the contextualist objection (Section 1.2) entails that research restricted to basic exposure cannot characterize processes of artistic understanding based on sensitivity to art-historical contexts and functions because a requisite of such an understanding is thinking about causal information carried by the artwork. For instance, as explained in Section 3.3, a theory of basic exposure cannot resolve the classic conundrum of the appreciation of look-alikes (Danto, 1981; Rollins, 1993) and forgeries (Bloom, 2010; Dutton, 1979, 1983). Contextual understanding of the causal history of a work requires adoption of the artistic design stance, which we discuss next.

3.2 The artistic design stance

Once exposed to a work, appreciators may investigate the production and transmission of the work understood as an individual exemplar (Bloom, 2010: Chapters 4-5; Bullot, 2009b; Rips, Blok, & Newman, 2006). Far from being historically shallow, this mode enables appreciators to become sensitive to the art-historical context of the work. Evidence from research on essentialism and the cognition of artifacts supports this hypothesis.

Research reviewed by Kelemen and Carey (2007) indicates that the understanding of artifact concepts by humans relies on the adoption of a 'design stance' (Kelemen, 1999; Kelemen & Carey, 2007). Kelemen and Carey adopt the theory-theory of concepts (Carey, 1985; A. Gopnik & Meltzoff, 1997; A. Gopnik & Wellman, 1994; Keil, 1989), which posits that development is best understood as the formulation of a succession of naïve theories. They combine this theory-theory

with the hypothesis that humans adopt *essentialism* (Bloom, 2010; Gelman, 2003) when reasoning about natural kinds such as *tiger*, *gold* or *water* (Boyd, 1991; Griffiths, 1999; Putnam, 1975; Quine, 1969). Psychological essentialism is the view that human adults assume that natural kinds have causally deep, hidden properties that constitute their essence. These properties explain the existence of individual members of the kind, determine their surface or structural properties, and explain the way they behave while exposed to causal interactions with other entities.

Going beyond the use of theory-theory to study concepts of natural kinds (Keil, 1989; Quine, 1969), Kelemen and Carey (2007) argue that it applies to concepts of artifact too. They provide evidence that adults use a causal-explanatory scheme to acquire artifact concepts and to reason about the history of artifacts (e.g., Bloom, 1996, 1998; German & Johnson, 2002; Matan & Carey, 2001). Their evidence suggests that artifact categorization is sensitive to the original function intended by the designer of an artifact. According to this psychological essentialism, the intended function of the artifact is its essence.

Humans adopt the design stance when they reason about artifacts and their functions. Since artworks are artifacts, humans are likely to adopt the design stance when they reason about works of art and understand their functions. Specifically, our proposal is that the *artistic design stance* involves at least three kinds of activities. First, appreciators begin adopting the design stance when they reason about the causal origins of the information carried by the work. Second, appreciators deploy this design stance if they elaborate hypotheses about the unique causal history or genealogy of the work, its functions, and the agents who produced it. Third, appreciators adopt a properly artistic design stance if they use their mindreading abilities to establish that the work was designed to meet artistic and cultural intentions within an art-historical context.

Although our analysis of the design stance is not expressed in the exact terms proposed by Kelemen and Carey (2007), we think that it is compatible with the principles of their proposal and the essentialist account of art and artifacts introduced by Bloom (2004, 2010). We thus propose that, like detectives (Eco & Sebeok, 1983; Ginzburg, 1979), appreciators adopt the artistic design stance when they use inferences—such as abductive inferences (Carruthers, 1992, 2006a; Kelemen & Carey, 2007; Lipton, 2004 [1991]; Lopes, 2005: p. 136)—to process causal-historical information carried by artworks and discover facts about past art-historical contexts. Through this kind of processing, appreciators extract the causal information carried by the work and find ways to track the history of an artwork, or perform mindreading tasks related to the intentions of the artist.

Causal reasoning and causal attribution. Works of art carry diverse sorts of information, for example about craftsmanship, style, and political allegiance. When an audience begins to infer from observable features of the work the causal history of unobserved actions that have led to these observable features, they begin to engage in the design stance. This claim is supported by the fact that humans spontaneously try to track down the cause of an event, especially if it is surprising or salient, a process that triggers causal reasoning (Gelman, 2003: Chapter 5; Heider, 1958). Once appreciators engage in the design stance, this engagement triggers the search for what caused the features perceived in an artwork. Such a search for causal information in artworks is a requisite for artistic understanding.

Deciphering the causal history of a work. Once appreciators adopt the design stance, they start processing information carried by the artwork as causal and historical information. This stance enables them to address basic questions about the history of the work such as authorship attribution, dating, influence on the design, provenance, or state of conservation. Appreciators need to decipher the causal history of the work, often by means of theory-based reasoning (Murphy & Medin, 1985), to address such questions about unobservable states of affairs. For instance, authentication and

dating can be guided by the use of theories about the causal history of a work, such as Giovanni Morelli's theory of authentication (Morelli, 1893 [1880]; Wollheim, 1974). Morelli claims that in order to decide authorship of paintings, it is necessary to study apparently insignificant details (e.g., rendering of ears, handwriting) that reveal the author's idiosyncrasies of handling, and thus enables appreciators to individuate the unique style of an artist.

Mindreading of agents in the art-historical context. In addition to triggering causal attribution and tracking history, the design stance may also prompt mindreading (Baron-Cohen, 1995; Nichols & Stich, 2003) and an artistic *intentional stance* (Dennett, 1987). In basic exposure, appreciators often use their mindreading abilities to engage in pretense without investigating its art-historical context (Section 3.1). In contrast, the design stance leads appreciators to inquire into the mental states of important agents in the original art-historical context of the work (e.g., intentions of the artist or patron).

Appreciators may use simulation (Goldman, 2006) or reasoning based on relevance and optimality (Dennett, 1990; Sperber & Wilson, 2002) to interpret the intentions of agents in bygone art-historical contexts. For example, an appreciator may interpret an artist's intention as a state aimed at producing a work whose function is to cause a specific emotional or cognitive process in the appreciator's mind. Mindreading driven by the intentional stance can enable audiences to apprehend an artwork from the perspective of the artist (Section 3.3). The audience may reason about the problem the artist tried to solve. In contrast to basic exposure, an appreciator who takes the design stance can imagine alternative solutions to the artistic problem and hence use counterfactual reasoning (Gendler, 2010; Nichols & Stich, 2003; Roese & Olson, 1995) to infer the way the artist might have solved it. This kind of mindreading is aimed at refining an appreciator's sensitivity to the causal history of the work and therefore enabling artistic understanding.

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3.3 Artistic understanding

If appreciators take the design stance as a means to interpret a work, they will increase their *sensitivity to* and *proficiency with* the art-historical context and content of this work. This increase in proficiency enables appreciation of art *based on understanding*. Appreciators have artistic understanding of a work if art-historical knowledge acquired as an outcome of the design stance provides them with an ability to explain the artistic status or functions of the work. Given the variety of the processes involved in understanding (Keil, 2006; Keil & Wilson, 2000; Ruben, 1990), we need to carefully distinguish the variety of scientific and normative modes of artistic understanding.

The *normative mode* of artistic understanding aims to identify and evaluate the artistic merits of a work, and more generally its value (Budd, 1995; Stecker, 2003). It is commonly based on contrastive explanations that compare the respective art-historical values of sets of artifacts. These evaluations are often viewed as essential to the practice of art critics (Beardsley, 1981 [1958]; Budd, 1995; Foster, 2002; Greenberg, 1961) and art historians (Gombrich, 1950, 2002). The *scientific mode* of artistic understanding does not aim to provide normative assessments, but to explain art appreciation with the methods and approaches discussed in the present article. In a way that parallels the combination of normative and scientific aspects in folk-psychology (Knobe, 2010; Morton, 2003), the normative and scientific modes of understanding are often intermingled in common sense thinking about art and scholarly writings about art (Berlyne, 1971: p. 21-3; Munro, 1970; Roskill, 1989 [1976]).

The normative mode is a traditional subject matter of philosophy. For example, Malcolm Budd (1995) derived from Hume's analysis of the standard of taste (1993 [1757]) and Kant's aesthetics (2000 [1793]) a novel normative conception of artistic understanding (see also Levinson, 1996;

Rollins, 2004). Budd characterizes artistic understanding as an assessment of the *value* and the function of a work, a task typically conducted in art criticism (1995: p. 40-1). On his account, the *artistic* value of an artwork is determined by the intrinsic value of the experience it offers (1995: p. 4, 40). By 'experience the work offers', Budd means an experience in which the work is adequately understood and its context-dependent and historical functions (Section 2.2) and individual merits grasped for what they are. Such artistic understanding requires that appreciators become sensitive to the artistry, creativity, and achievement inherent in a work apprehended in its unique art-historical context of creation (Dutton, 1974).

Two premises of the psycho-historical framework seem compatible with Budd's account. First, the appreciator's normative understanding of a work relies on the design stance to track the aspects of art-historical contexts that explain the value of the experience the work offers. Second, since the aesthetic functions along with the cultural, political, or religious functions of works of art are determined by historical contexts and lineages (G. Parsons & Carlson, 2008), sensitivity to art-historical contexts is a necessary condition to Budd's normative artistic understanding. In contrast to the psycho-historical account, however, Budd's analysis includes neither the scientific mode of understanding nor psychological processes underlying (normative or scientific) understanding. In our framework, examples of psychological processes encompass theory-based reasoning about the functions or values of the work, emotions elicited by the appreciator's understanding of the art-historical context of a work, and differences in appraisal of indistinguishable artworks with distinct histories.

Theory-based reasoning. The appreciator's understanding of a work has to rely on naïve or scientific theories (A. Gopnik & Meltzoff, 1997; Kelemen & Carey, 2007; Murphy & Medin, 1985) and causal reasoning (A. Gopnik & Schulz, 2007; Shultz, 1982). Theories have characteristics such as conceptual coherence, power of generalization, and representations of causal structures (A.

Gopnik & Meltzoff, 1997). These characteristics enable users of art-related theories to make predictions, produce cognitively 'rich' interpretations of an artwork, and generate abductive inferences (or inferences to the best explanation; see Carruthers, 2002, 2006a; Coltheart, Menzies, & Sutton, 2009; Lipton, 2004 [1991]). Theories of the art-historical context are therefore necessary conditions for the appreciators' competence in reliably identifying and explaining key aesthetic properties such as authenticity, style, genre, and context-dependent meanings or functions.

Consider style. Basic exposure may lead appreciators to recognize artistic styles through probabilistic learning and similarity-based classifications (Section 3.1). Since such processing is shallow in respect of art history, appreciators can hardly come up with accurate explanations of the identification of styles and the assessment of their similarities. In contrast, appreciators who develop artistic understanding can use historical theories about the relevant art-historical context to identify styles more reliably. Theories are needed in this case because stylistic properties of individuals or schools are difficult to identify and often result in disagreements (Arnheim, 1981, 1986; Goodman, 1978; Lang, 1987; Walton, 1987; Wölfflin, 1950 [1920]). Therefore, relevant identification of styles must appeal to theories of art-historical contexts that provide explanations for such classifications.

Theories of aspects of an art-historical context can also inform the appreciators' understanding of the mind of important intentional agents. This can be illustrated by the role of theories to inform perspective-taking or simulations aimed at understanding the decisions made by an artist or attempting to re-enact the artist's decision or experience (Croce, 1909 [1902], 1921).

Taking the design stance opens up the possibility of misunderstanding in art interpretation, which may depend on fallacies or incorrect explanation of the relationships between the work and its art-historical context, and not just on mistakes in the processing of observable features of the artwork,

as in basic exposure. There is evidence that communicators tend to overestimate their effectiveness to convey a message (Kaysar & Barr, 2002). Some artists might overestimate the degree to which an audience is capable of understanding their intention. Similar biases in appreciators (Ross, 1977) and cultural differences in causal attribution (Miller, 1984; Morris, Nisbett, & Peng, 1995; Nisbett, 2003) may result in causal reasoning on the side of the audience that leads to misunderstandings in art appraisal.

Causal reasoning and emotions. Inferences about the causes of an artwork are epistemic processes, and epistemic processes can trigger emotions (Hookway, 2002; Thagard, 2002). Though emotions are often elicited through basic exposure (Section 3.1; Carruthers, 2006b; Harris, 2000, Chapter 4; Juslin & Västfjäll, 2008; Silvia, 2009), appreciators may experience different types of emotions in the mode of artistic understanding. The quality of the emotions and feelings elicited by an artwork may depend on causal attribution.

A study on helping behavior of by-standers illustrates this point (Piliavin, Rodin, & Piliavin, 1969). The authors found that helping depended on the attribution of the cause of an emergency, such as handicap versus drunkenness, and the effect of causal attributions on helping behavior was mediated by emotions, such as anger and pity (Reisenzein, 1986; Weiner, 1980). Transferred to art appreciation, these findings suggest that the same artwork may elicit different emotions, depending on the attributions the audience makes. For example, Manet's paintings that glorified bullfighting (Wilson Bareau, 2001) are certainly seen from a different perspective by most contemporary audiences and elicit emotions far from glorifying bullfighting. However, appreciators may take the perspective of an admirer of bullfighting and appreciate these paintings as intended in their original context.[v] If findings on causal attributions and emotions in the context of helping behavior could be transferred to art appreciation, it would mean that the design stance, compared to basic exposure,

would result in improved artistic understanding because different causal inferences may result in the experience of different emotional qualities.

This analysis can be contrasted with a suggestion made by Fodor (1993). To rebut theories of art appreciation that stress the role of historical expertise like Danto's or Dickie's contextualist theories, Fodor conjectures that appreciators can adequately interpret a work of art without knowing its intentional-causal history, simply by imagining a fictitious causal history (a 'virtual etiology') and fictitious art-historical contexts. In contrast to Fodor's hypothesis, the psycho-historical framework predicts that virtual etiologies based on arbitrary premises would result in deficient artistic understanding because they do not track the actual causal history. Appreciations based on fictitious causal histories are likely to lead to mistakes in artistic understanding, unless the appreciators' use of a fictitious causal history plays the role of a thought experiment (Gendler, 2004; Gendler & Hawthorne, 2002) and helps them track *real* artistic properties and art-historical contexts.

Theories of expression in art (Collingwood, 1938, 1946; Robinson, 2005) tend to agree with these predictions of the psycho-historical framework. For they entail that understanding the way a work expresses a particular content cannot be achieved without some understanding of its *actual* (rather than virtual) history and psychological effects.[vi] In the realm of everyday behavior, Elias (1969 [1939]) has shown that the triggers of certain emotions can be specific to a particular period of history. The above-mentioned paintings of bullfighting by Manet support this phenomenon for the realm of art. Elias's work and the example from Manet illustrate the point that the cognitive architecture of mental and brain processes underlying the experience of emotions probably remained the same in written history, and may be seen as a universal; however, the *triggers* of emotions may have changed and are therefore an object of historical inquiry. To understand an artwork that was intended to convey an emotion, appreciators have to know what triggered an

emotion at the time of the production of a work and may attempt to reproduce the same kind of response.

The appreciation of look-alikes, and forgeries. Consider the classic conundrums of artistic appreciation of look-alikes (Danto, 1981) or forgeries (Dutton, 1979; Stalnaker, 2005) and of the attribution of authorship (Ginzburg, 1979; Morelli, 1893 [1880]; Vasari, 1991 [1550]; Wollheim, 1974). If art were appreciated only at the level of basic exposure, and thus without causal understanding, two artworks that look alike—as in Danto's red squares (1981: p. 1-5) and other indiscernibles (Wollheim, 1993)—would elicit equivalent responses in appreciation. Thus, *Brillo Boxes* made by Warhol (Danto, 2009) would elicit equivalent appraisal as the stacks of Brillo boxes in supermarkets. However, analysis of the artistic appreciation of look-alikes (Danto, 1981) and historical records of responses to the discovery of forgeries (Arnau, 1961; Godley, 1951; Werness, 1983) contradict the prediction of an equivalent appraisal of look-alikes. Appreciators value look-alikes differently once they understand that they have different causal history. First, this view is supported by the well-documented ubiquity of essentialism in human cognition because psychological essentialism leads people to search for hidden causes and therefore go beyond the similar appearances of look-alikes (Bloom, 2010: Chapters 4-5). Second, it is supported by conceptual research (Bullot, 2009b; Evans, 1982; Jeshion, 2010) and empirical evidence (Rips, et al., 2006) demonstrating the ubiquity in human adult cognition of the ability to track individuals as unique exemplars. Hood and Bloom (2008) provided evidence that the interest in the historical discrimination of look-alikes is present even in children, who preferred an object (a cup or a spoon) that had belonged to Queen Elizabeth II to an exact replica. This preference for originals compared to replica or forgeries is inexplicable by a psychological approach that considers *only* basic exposure such as Locher's (2012) account.

The discovery that works allegedly painted by Vermeer (Bredius, 1937) were in fact fabricated by van Meegeren (Coremans, 1949) has led their audience to re-assess their artistic value precisely because the causal history of the works and their relations to their maker and art-historical context matters to their artistic value. His forgeries are profoundly misleading when they are taken to be material evidence of Vermeer's past action and artistry. Our psycho-historical framework suggests that appreciators dislike being misled by artistic forgeries precisely because forgeries undermine their historical understanding of artworks and their grasp of the correct intentional and causal history.[vii]

3.4 Recapitulation

The psycho-historical framework posits that there are three modes of appreciation and suggests testable empirical hypotheses for each mode. According to the core hypothesis, appreciators' responses to artworks vary as a function of their sensitivity to relevant art-historical contexts. This account contradicts the claim that sensitivity to art-historical contexts is not a requisite of art appreciation and art understanding (Section 1.1 and 2.4). Our objections to the universalist claims that deny the historical character of art appreciation does not entail a radical form of cultural relativism, which would view scientific research on art appreciation impossible in principle due to its historical variability. In contrast to anti-scientific relativism, research on artifact cognition and essentialism (Section 3.2) demonstrates that contextual variables moderate the effects of mental processes in ways that can be investigated empirically.

We suggested that basic exposure is a requisite for adopting the design stance, which is in turn a requisite for artistic understanding (Figure 2). Parsons (1987) provided a framework that lends support for this claim. His account of the development of understanding representational painting— from the stage of novices to expertise—seems to reflect the modes of art appreciation presented

here. In the first two stages of this development, viewers do not go beyond the characteristics seen in the picture. The appreciators' interest in the meaning of the artwork and its connection to a culture and art history emerges only in the later stages.

Our claim that artistic understanding depends on adopting the design stance and adopting the design stance on basic exposure does not entail that appreciators' processing follows the three stages in a rigid order. Experts might have an ability to summon historical information very rapidly by means of fast recognition of task-relevant patterns (Chase & Simon, 1973; Pylyshyn, 1999: p. 358-9) and attention routines (Ullman, 1984) controlled by causal reasoning elicited by the design stance. Although we are lacking direct empirical evidence to adjudicate these hypotheses applied to art appreciation, findings from basic cognitive phenomena like top-down processing in understanding events (Zacks & Tversky, 2001) and stories (Anderson & Pearson, 1984; Kintsch, 1998, 2005; Schank, 1990, 1999) indirectly suggest that searching for causal information and employing knowledge about art history should influence the interpretation of a painting from the very first moment one is exposed to it.

The main prediction—that responses to artworks vary as a function of appreciators' sensitivity to art-historical contexts—receives preliminary support from the fact that experts often differ from novices in their evaluation of visual (e.g., McWhinnie, 1968) or musical stimuli (e.g., J. D. Smith & Melara, 1990). The difference might be explained by the fact that art experts are more likely to adopt the design stance and be proficient in art and its history than novices. However, this explanation awaits further research to corroborate that the effect of expertise on evaluation of artworks is mediated by these two modes of appreciation. To develop such research and address these questions, empirical aesthetics and neuroaesthetics have to conduct their research within the psycho-historical framework.

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4. Empirical aesthetics, neuroaesthetics, and the psycho-historical framework

Most research in empirical aesthetics disregards the theoretical consequences of historical and contextualist approaches to art (Sections 1 and 3.4). Researchers in empirical aesthetics rarely discuss what is unique to art appreciation in comparison to the appreciation or use of other kinds of artifacts, often assuming that using works of art as stimuli is sufficient to study art appreciation. We argued that this narrow approach cannot succeed because it is incomplete. The psycho-historical framework suggests two additional requirements for productive experimental research on art appreciation: First, researchers have to consider sensitivity to art-historical contexts when they choose the independent variables in their studies. Second, instead of focusing exclusively on mental processes related to basic exposure, investigators might instead measure dependent variables that track processes specific to other modes of appreciations, such as adoption of the design stance and acquisition of context-specific artistic understanding.

4.1 Independent variables and art-historical contexts

Adopting a method introduced by Fechner (1876; see also Martin, 1906; Pickford, 1972: Chapter 2), some studies in empirical aesthetics use simplified stimuli, such as geometrical patterns, to examine the influence of perceptual variables on aesthetically relevant judgments. Such studies may reveal what Palmer, Schloss, and Gardner (2012) term *default aesthetic biases* (p. 213) in perceptual exposure.

Berlyne (1974) used simplified stimuli to show that people preferred medium complexity and therefore medium arousal potential, supporting his seminal psychobiological account of aesthetic preference. Using artworks, however, Martindale, Moore, and Borkum (1990) presented data that contradicted Berlyne's seminal psychobiological account. They showed that preference increased

linearly with complexity, presumably due to the fact that complexity was positively correlated with judged meaningfulness of the paintings. This result suggests that theories derived from studies that do not use artworks as stimuli have limited explanatory value for explaining the complex phenomena of art appreciation. Recently, Silvia (2012) criticized the fluency theory of aesthetic pleasure proposed by Reber et al. (2004) for exactly that reason.

The psycho-historical framework suggests that studies of art appreciation lack explanatory power if they use simplified stimuli that are disconnected from an art-historical context. Instead of examining the appreciators' sensitivity to art-historical contexts by presenting artworks, experimenters collect data about ambiguous patterns within an experimental situation that result in interpretations (Schwarz, 1994) that are different from appreciation of actual artworks. In contrast, there are two kinds of empirical studies that, in our opinion, come very close to meeting the methodological criteria defining empirical research within the psycho-historical framework. First, some studies manipulate appreciators' art-historical knowledge as an independent variable (Kruger et al., 2004; Silvia, 2005). Second, one laboratory study manipulated the art-historical context experimentally (Takahashi, 1995).

Manipulation of historical knowledge. Kruger et al. (2004) provided evidence that appreciators use an effort heuristic to rate the quality of artworks. In their study, participants gave higher ratings of quality, value, and liking for a painting or a poem the more time and effort they thought the work took to produce. Although Kruger et al.'s study did not use the concepts of the design stance or functions of artifacts, we conclude from two premises that their effort heuristic is likely to reflect the use of the artistic design stance. First, in this study the concept of effort refers to an essential characteristic of the production of the artwork. Second, veridical attribution of effort in this study cannot be made without an inquiry into the causal history of the artifact. Since the design stance

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elicits an inquiry into the causal history of the artifact, the effort heuristic is likely to be an indicator of the design stance.

Silvia (2005) proposed another type of manipulation of appreciators' knowledge. He predicted that people become interested in a novel artwork if they have the potential to cope with it in such a way that they eventually understand it. In one study, Silvia presented participants with an abstract poem by Scott MacLeod (1999). While a control group just read the poem, another group was given the contextual information that the poem was about killer sharks. Provided with this information, this group showed more interest in the poem than the control group. Although Silvia's theory is ahistorical, his experimental design introduced information about an art-historical context that was not available in the poem itself. The communication of the artist's intention to write a poem about killer sharks provided the audience with an opportunity to take the artistic design stance (Section 3.2).

Experimental manipulation of the art-historical context. Takahashi (1995) manipulated artistic intentions and revealed their connection to appreciators' experience. The author examined whether interindividual agreement occurs in the intuitive recognition of expression in abstract drawings. To this end, she first instructed art students to create non-representational drawings that express the meanings of concepts like anger, tranquility, femininity, or illness. At a later stage, students without a background in art had to rate a selection of these drawings in regard to their meanings on a semantic differential scale (Osgood & Suci, 1955). In addition, participants were instructed to complete the same scale for the words used to express these concepts (e.g., 'anger', 'tranquility', etc.). Takahashi (1995) found a surprising degree of agreement between the expressive meanings of the drawings and the word meanings. This agreement supports her claim that human appreciators have intuitions about expressive meanings of non-symbolic attributes in drawings, at least within the same culture.

Takahashi showed how participants who adopt the design stance can infer an artist's intention from exposure to a drawing. From the standpoint of the psycho-historical framework, her study suggests that researchers can study such phenomena with experimental materials generated by a laboratory model of an art-historical context. The artistic design stance is a necessary link between this basic exposure to the drawing and the process of inferring artistic intentions from a work designed to express meaning. However, as participants in Takahashi's study were instructed by the experimenter to assess the drawings along emotional dimensions, it remains unclear whether participants would have adopted this design stance spontaneously.

Since the empirical paradigms used by Kruger et al. (2004), Silvia (2005), and Takahashi (1995) meet the methodological requisites of the psycho-historical framework, these studies indicate that experimental research within the framework is feasible. Providing participants with knowledge about intentions guiding the production of a work, as Silvia did, may serve as a shortcut to inducing better knowledge of the art-historical context. Takahashi's study demonstrates that research based on a psycho-historical approach does not have to be limited to guesswork about the artist's intentions or statements by the artists about their art-historical contexts. Such artistic intentions can be instructed and lead to rigorous experimental manipulations within a laboratory model of artistic production and experience.

4.2 Dependent variables that measure appreciators' sensitivity to art-historical contexts

From the standpoint of the psycho-historical framework, dependent measures relevant to the empirical study of art appreciation should inform investigators about participants' sensitivity to art-historical contexts. However, this is often not the case in empirical aesthetics.

Two studies representative of empirical aesthetics illustrate this point. McManus et al. (1993) and Locher (2003) observed that participants untrained in art detected changes in pictorial composition, at least when the deviations from the original composition were considerable. The dependent variables in these studies were judgments regarding which painting is the original (Locher, 2003) or the participants' preferred work (McManus, et al., 1993). In both experiments, participants chose the original painting that apparently had the more balanced composition. Locher later concluded that "balance is the primary design principle by which the elements of a painting are organized into a cohesive perceptual and narrative whole that creates the essential integrity or meaning of the work" (Locher, Overbeeke, & Stappers, 2005: p. 169). These studies fail to consider the predictions suggested by a contextualist approach to the appreciation of imbalance.

According to a contextualist approach, appreciators' responses to violation of balance in a work should be influenced by context-specific factors such as understanding of the function of an imbalanced composition in a particular situation. Investigators in this case need to design experimental paradigms using dependent measures that are sensitive to appreciator's sensitivity to balance in the art-historical context. For instance, in the art-historical context of Minimalism, the monumental steel sculptures by Richard Serra (b. 1939) often use imbalance in the composition of their parts for expressive site-specific effects (Crimp, 1981; Kwon, 2002, 2009). Appreciators of Serra's sculptures must therefore deploy the design stance to understand that imbalance has expressive functions in Serra's sculptures. In a study (Palmer, et al., 2012) presenting photographs as stimuli, imbalance was used to convey contextual meaning. In contrast to the studies by Locher and McManus et al., the authors observed that violation of balance can enhance judged preference if imbalance fits the content a photograph is supposed to convey, providing empirical evidence for the context-sensitivity of the preference for pictorial composition and appreciation. We assume that similar effects would be observed with other artistic media.

Neuroaesthetics (Ramachandran & Hirstein, 1999; Zeki, 1998, 1999) may take art-historical context into account to make sure that the measured brain activation is connected to the artwork and not just an epiphenomenon that is artistically irrelevant. For example, Ramachandran and Hirstein (1999) propose eight laws of artistic experience. These laws of artistic experience hypothesize that a few basic psychobiological processes—such as learning, grouping and heightened activity in a single dimension or 'peak shift'—are necessary conditions of aesthetic experience. The psycho-historical framework suggests that, to be relevant to art theory, the observed peak shift needs to be connected to art-historical contexts as an intended or unintended effect of the historically bound creation of works of art.

In conclusion, relevant dependent variables in experiments on art appreciation should be measures of responses that probe the appreciators' sensitivity to art-historical contexts. In addition to linking existent dependent variables (e.g., preference; perception of pictorial composition) to sensitivity to art-historical contexts, this framework calls for the use of new dependent measures that reflect these two modes of art appreciation that have been neglected by empirical aesthetics. For example, researchers may assess the amount of causal reasoning, depending on different attributes of artworks. We will argue for a similarly contextualist approach in our analysis of artists' manipulation of fluency in the next section.

5. **Artistic understanding and art-historical manipulations of fluency**

This section will discuss how an existing psychological theory, the processing fluency theory of aesthetic pleasure (Reber, Schwarz, et al., 2004), can be adapted in order to meet the requirements of the psycho-historical framework. This theory focuses on the positivity of fluency and views disfluency as a source of negative affect. As we shall see, however, disfluency can elicit inferences

about the artwork and a more analytical style of processing in appreciators who adopt the design stance and acquire art-historical understanding.

The term *processing fluency* (or fluency) refers to the subjective ease with which a mental operation is performed (Reber, Wurtz, & Zimmermann, 2004). Kinds of fluency vary as a function of types of mental operations (Alter & Oppenheimer, 2009; Winkielman, Schwarz, Fazendeiro, & Reber, 2003), such as perception (perceptual fluency) or operations concerned with conceptual content and semantic knowledge (conceptual fluency).[viii]

There are at least three determinants of fluency relevant to studying the basic exposure to artworks. First, fluency is a typical outcome of the perception of visual properties such as symmetry or contrast (Arnheim, 1974 [1956]; Reber, Schwarz, et al., 2004). Second, repeated exposure to artworks increase the ease with which they can be perceived (Cutting, 2003). Third, implicit acquisition of prototypes or grammars results in increased fluency (Kinder, Shanks, Cock, & Tunney, 2003; Winkielman, Halberstadt, Fazendeiro, & Catty, 2006) and in affective preference (Gordon & Holyoak, 1983; Winkielman, et al., 2006; Zizak & Reber, 2004). An example from art is style because artworks have recurring regularities that familiarize the audience with an artist's work through implicit learning (Section 3.1).

According to the psycho-historical framework, a work of art is an artifact designed to elicit specific mental states in its appreciators through basic exposure, adoption of the design stance, and artistic understanding. In this respect, like rhetoric (Danto, 1981; Fodor, 1993), works of art can be directive (Gombrich, 1990; Lopes, 2004, 2010) because they are aimed at affecting the audience. Artworks causally affect the appreciators' emotional and cognitive states when attended. Thus, as this characteristic should transfer to states related to fluency, it is plausible that artists use works of art to manipulate fluency to elicit target experiences or states. For instance, artists may aim to elicit

processing disfluency in order to prevent automatic identification of the content of a work, or elicit

thoughts about issues that are culturally significant in their art-historical context.

Table 1. The artistic manipulation of high fluency and disfluency

Function of high fluency	Function of disfluency	Examples of disfluency (details in the text)
Expression or representation of		*Artists*
Order; organization	Chaos; disorder; disorganization	Turner
Harmony; accord; balance	Struggle; disharmony; imbalance	Delacroix; Rubens
Calmness; inertia	Movement; energy	Boccioni, Marinetti
Familiarity; normalcy	Alienation; strangeness	Dada, Surrealism
Certainty; control	Uncertainty	Immendorff
Predictability; determinism	Chance; indeterminacy	Cage
Meaningfulness; teleology	Absurdity; meaninglessness	Baselitz; Beckett
Prompting of		*Artists*
Identification of content; identification with characters in imaginings	Analytical thinking; alienation; meta-representation	Shklovskij; Brecht
Attention to salient, well-known, traceable attributes	Attention to non-salient, neglected, culturally valued attributes	Malevich; Mondrian; Giacometti

Disfluency as expressive means. Artists may manipulate the ease of processing of their works to

strategically express emotions (Robinson, 2004, 2005) or design pictorial content (Lopes, 1996),

and consequently direct the appreciators' attention at such content (Carroll, 2002; Eaton, 2000).

Table 1 illustrates this hypothesis with examples of contrasts between opposed categories of

content. The upper panel gives a non-exhaustive list of examples of types of content that may be

expressed or represented by high fluency and disfluency. Roughly, the examples are ordered on a

continuum from formal attributes (perceptual fluency) to conceptual attributes (conceptual fluency).

Fluent processing might be a possible outcome of an artwork embodying classical ideals of beauty, such as the ones propagated by art historian Johann Joachim Winckelmann (1987 [1756]; Winckelmann & Irwin, 1972): order, harmony, simplicity and calmness. Although it appears difficult to find cases where artists or art theorists explicitly conceived of high fluency as a means to express artistic content, this would be feasible in principle. In contrast, there are documented instances where disfluency is used to express artistic content, or at least to accentuate the cognitive effects inherent in the appreciation of the content of an artwork. These cases include, for instance, the expression of disorder (e.g., Turner, see Clark, 1961: p. 143), struggle (e.g., Delacroix and Rubens, see Mras, 1966: p. 107 f.), or speed and violence as in Boccioni's Futurist paintings and sculptures (Antliff, 2000; Boccioni, 1977 [1914]; Petrie, 1974). In the *Manifesto of Futurism*, Marinetti defines the aims of Futurism by means of an attack of Classicist ideals: 'Up to now literature has exalted a pensive immobility, ecstasy, and sleep. We intend to exalt aggressive action, a feverish insomnia, the racer's stride, the mortal leap, the punch and the slap.' (Marinetti, 1909).

Research on the response to consumer products suggests that disfluency may also signal novelty (Cho & Schwarz, 2006). In art, paintings that lack familiarity may express content related to alienation and strangeness, as in the expression of content in Dada (Hauser, 1951: p. 935) and in the surrealist movement (Breton, 2008). Artworks may be designed to express uncertainty (e.g., Immerdorff, see Görner, 1997), indeterminacy (e.g., in music; Cage, 1973 [1961]; Gann, 2010), meaninglessness (e.g., Baselitz; Geldzahler, 1994; Reber, 2008), and absurdity of a situation (e.g., Beckett, 1954; Esslin, 1961; Richter, 1998).

The few examples outlined above indicate the existence of artworks that elicit disfluent processes because they have features that are difficult to comprehend. According to the fluency theory of aesthetic pleasure (Reber, 2012; Reber, Schwarz, et al., 2004), disfluency should elicit negative affect. This prediction misses the point elucidated by contextualism, however, because disfluency

may result in the adoption *of the design stance* by the appreciators who may search for the meaning of disfluency in order to achieve artistic understanding. This may have two consequences: First, transitions between fluent processing and disfluency, and vice versa, can, in addition to biasing affect, serve as a cue or guide to inferences, as illustrated by fluency effects on judgments of effort (Song & Schwarz, 2008a) and judgments of conceptual coherence (Topolinski & Strack, 2009). Second, adoption of the design stance could lead appreciators to become proficient with art-historical contexts and conceptual content of disfluent works. Proficiency with the conceptual content of perceptually disfluent artworks may yield aesthetic pleasure because proficiency yields high conceptual fluency that could override the difficulty of identifying representational or expressive elements. Evidence supporting this hypothesis has been reported by Belke, Leder, Strobach, and Carbon (2010).

Fluency, however, may be misattributed to any meaningful conceptual dimension. For example, an appreciator may look at a painting and conclude that the lack of clarity in the depiction of a scene represents movement, failing to notice that the artist intended in fact to represent alienation by means of disfluency. This appreciator misattributes disfluency to movement. Given the potential for misattribution, how can an audience know which content might be expressed by disfluency in a particular artwork? The psycho-historical framework addresses this puzzle by postulating that appreciators who adopt the design stance need to acquire proficiency about the art-historical context to track causal information and infer the accurate content.

Disfluency as a means to provoke elaboration. Easy processing signals that the interaction between person and environment is going smoothly, and no extra attention is needed to monitor the situation (Winkielman, et al., 2003). Difficult processing may signal an ongoing problem that requires a person's attention and may elicit analytical thinking. Dewey (1910), for instance, proposed that the starting point of each act of reflective thinking is a difficulty. Contemporary artists might have a

similar intuition when they believe that 'if a work is to provoke serious thought, it must be ugly, disturbing, difficult to look at' (Lopes, 2005: p. 131). Studies by Alter et al. (2007) and Song and Schwarz (2008b) indeed found that disfluency 'makes people think' in that it elicits analytical processing.

In the case of art appreciation, perceivers of a work may initiate reflexive elaboration and trigger the design stance if they encounter difficulties in deciphering the content or function of the work. This hypothesis can be tested empirically. For example, one could test whether participants are more likely to adopt the design stance (by asking about the history of an artwork or the intention of an artist) when they are engaging with a work that is difficult rather than easy to process. Such a prediction could be related to Brecht's literary theory. Drawing from Shklovskij (1965 [1917]), Brecht theorized this sort of effect as *alienation effect* (*Verfremdungseffekt*). In Brechtian drama, the primary function of this alienation effect is not to express content, but to prevent automatic identification with the depicted characters and prompt the audience to reflect about the depicted events and the art-historical context. To achieve this alienation effect, an artist has to turn 'the object of which one is to be made aware, to which one's attention is to be drawn, from something ordinary, familiar, immediately accessible, into something peculiar, striking and unexpected' (Brecht, 1964, p. 143). However, this disfluency does not render the piece as a whole difficult to understand, as Brecht stated at another place: 'When your work is complete, it must look light, easy. […] You mustn't leave out the difficulties, but must collect them and make them come easy through your work. For the only worthwhile kind of ease is that which is a victory of effort' (Brecht, 1964, p. 174).

Furthermore, artists may elicit disfluency in the perception of salient attributes in order to direct the audience's attention to the presence of less salient, but culturally valuable attributes (Dutton, 1974; Eaton, 2000). Consider, for example, the works by Alberto Giacometti. His sculptural depictions of

human figures lack most of the cues that help identify a three-dimensional object as a human body, such as contours, proportions, smooth surfaces and prototypical colors. Despite the absence of such cues, the perceiver can still recognize that the sculptures depict human figures (Sartre, 1965: p. 191) because the rudimentary topology of human anatomy is preserved. Giacometti's sculptures can be conceived of as strategically designed to direct the public's attention to such essential topological features as a result of adopting the design stance. Similarly, abstract artists like Mondrian or Malevich introduced geometrical forms, in which the depiction of familiar objects progressively vanished. This move made such artworks disfluent for an audience accustomed to representational art, but it can be viewed as a strategy to disrupt thoughtless appreciation and direct attention to the interest of specific non-representational compositions (Malevitch, 1959).

In sum, works eliciting disfluency are used to interrupt the audience's thoughtless appreciation of a work and makes the audience pay attention to and inquire about non-salient but culturally valuable attributes in art-historical contexts. Such an aesthetic inquiry is likely to promote artistic understanding because of its connection to the artistic design stance. As a result, the perceptual difficulty caused by alienation turns into conceptual ease due to psycho-historical proficiency with relevant attributes revealed by the artwork and knowledge of the art-historical context.

6. Conclusion

We began with an analysis of the antagonism between the psychological and historical approaches. In their research, psychologists and neuroscientists neglected the appreciators' sensitivity to art-historical contexts. This oversight led historicists to disregard psychological research on art appreciation because in their opinion psychological accounts failed to contribute to a scientific exploration of art. In this context, we argued that research should be conducted within a psycho-historical framework for the science of art appreciation in order to unify the two dominant traditions

in art theory. We propose to start from a framework that apprehends artworks as artifacts appreciated by means of three modes of art appreciation. A series of examples demonstrate that theory and research methods in psychology and neuroscience can be adapted to the psycho-historical framework. Psycho-historical theories of art can integrate inquiries into art in the humanities with the cognitive and social sciences of art, leading to refinement of testable hypotheses. In sum, research within the psycho-historical framework can help interdisciplinary scholars build a still hypothetical science of art.

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[i] The term *appreciator* refers to the person who is making the appreciation, regardless of whether this person is the artist or the member of an audience. If we focus on one of these categories, we will use either *artist* or *audience*. *The artist* may either refer to a single person or a collective of artists.

[ii] The appreciator's *sensitivity* to an art-historical context is the fact that some of the appreciator's mental processes involved in some mode of art appreciation are *responsive to* or *track* information relative to this art-historical context. For more on epistemic sensitivity, see, e.g., Nozick (1981), Azzouni (2004), and Sosa (2007).

[iii] At first sight, the theory of the evolution of artistic taste by Colin Martindale (1990) seems to consider both history and psychology, explaining changes in artistic styles by the effect of habituation. However, instead of proposing a theory within the psycho-historical framework, Martindale's approach can best be classified as an example of pro-naturalistic historicism (Popper, 1976 [1957]), which tries to explain trends in history by means of a theory of historical

change that predicts future trends. Martindale underlines this claim with his book's subtitle, "The predictability of artistic change" and claims—in line with other universalist approaches—that art history does not play a significant role in art appreciation. Popper (1962, 1976 [1957]) rejected prophetic philosophies of history on the ground that historical trends depend on historical events that cannot be predicted by science. Beyond exceptions to the predicted trend in Martindale's data, Popper's argument undermines Martindale's prophetic empirical aesthetics in principle. In contrast to Martindale's theory, the psycho-historical framework does not aim at predicting long-term historical trends, and appeals to art history to find accurate aesthetic variables in the investigation of art appreciation.

[iv] Such basic processes are involved in phenomena studied in evolutionary accounts of art appreciation. For example, appreciators' immediate preferences might exhibit universal aesthetic biases, such as preferences for savanna-like landscapes (Dutton, 2009: Chapter 1; Kaplan, 1992) or symmetry in faces (Rhodes, 2006). If these evolutionary accounts are correct, such universal biases would be normally manifested in the mode of basic exposure.

[v] If the audience is willing to do so: see Gendler (2000) on the phenomenon of *imaginative resistance*, the unwillingness to imagine events that contradict a person's moral convictions.

[vi] Jenefer Robinson (1979, 2004, 2005) combined the psychology of emotions with a theory of artistic expression that incorporates aspects of the historical nature of artworks. She provides conditions for defining the expression of an emotion in an artwork (2005: p. 270) that can be transposed into those of the psycho-historical framework. For example, she argues that, as a result of the articulation and elucidation of an emotion in the work, appreciators can become sensitive to the intended emotion and bring it to consciousness. This condition alludes to processes that we think are guided by the design stance and lead to artistic understanding.

[vii] This point does not conflict with the fact that some reassessments of authorship do not lead to dramatic reassessments of artistic value, such as in the music of the 18th century—where erroneous ascriptions were frequent (Cudworth, 1954), most notoriously for the works of Giuseppe and Giovanni Battista Sammartini (Mishkin, 1959). According to the psycho-historical framework, these changes of ascriptions did not result in a marked re-evaluation of the work because they did not result in a marked change in the relationship of the works to their stylistic and art-historical context.

[viii] While Smith and Smith (2006) used the term *aesthetic fluency* to roughly denote what we call *proficiency* with an art-historical context, we will use *fluency* to denote processing ease.