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## From Artistic Creation to Aesthetic Reception: The Mirror Model of Art

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# From Artistic Creation to Aesthetic Reception: The Mirror Model of Art

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The fields of creativity and aesthetics remain relatively separate in spite of the great advances made in the psychology of the arts over the past century. This divide has limited our understanding of the experience of art. Here I present a model that describes the interface between the two sides: art-making and art-viewing. According to the model, aesthetic experiences *mirror* the art-making process in the sense that the early stages of aesthetic processing correspond to the final stages of art-making; conversely, the late stages of aesthetic processing correspond to the initial stages of art-making. Considering the aesthetic processing of an artwork in terms of the artistic processes that produced it allows for an account of the experience of art in its fullest manifestation: one that could be self-referential, pleasurable, challenging, or even repulsive. To provide a background, a review of relevant research on creativity and aesthetics is provided. The theoretical and practical implications of the mirror model are also discussed.

*Keywords:* aesthetics, creativity, art-making, psychology of art, painting

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The psychology of the arts has a long history. Psychological aesthetics dates back to G. T. **Fechner's** (1876) early works, while empirical research on creativity was advanced following **Guilford's** (1950) APA Presidential Address—a call to action for more research in the area. In fact, the psychology of aesthetics, creativity, and the arts is the second oldest branch of psychology after psychophysics. However, even with the great progress that has been achieved during the past century of arts research (e.g., **Arnheim**, 1954; **Barron**, 1955; **Berlyne**, 1971; **Fechner**, 1876; **Gombrich**, 1960; **Guilford**, 1967; **Kreitler & Kreitler**, 1972; **Vygotsky**, 1971), the fields of aesthetics and creativity remain relatively separate with creativity researchers mainly studying concepts and processes related to art-making and aesthetics researchers focusing on topics related to art-viewing. Moreover, explanatory models and theories usually focus on either field, to the neglect of the other. This tradition is reflected in the types of research presented recently at the two major conferences devoted to the psychology of art. The 2011 conference of the APA's Society for the Psychology of Aesthetics, Creativity, and the Arts hosted presentations primarily focused on creativity research, whereas the 2010 Biennial Congress of the International Association of Empirical Aesthetics included mainly presentations on aesthetics research.

Specialization by scholars (present author included) on either aesthetics or creativity has been beneficial insofar as it has enabled relatively straightforward characterizations of various art-related concepts. However, this practice has led to the neglect of the crucial interface that connects the two sides. An area in which this is particularly evident is research on the experience of art. Sepa-

rating art-making from art-viewing severs the link that I will argue holds the key to gaining empirical understanding of the human experience of art in its fullest extent—challenging, insightful, self-referential, and transformative. In this article, I present a model that is based on what we know about art-making and art-viewing and that describes how these two processes interface. I also propose that aesthetic experiences *mirror* the art-making process.

Recent conceptualizations of aesthetic experiences of art (**Chatteerjee**, 2003; **Koelsch & Siebel**, 2005; **Leder, Belke, Oeberst, & Augustin**, 2004; **Tinio & Leder**, 2009b) have emphasized information-processing stages that correspond to characteristics of the viewer and particular aspects of an artwork. For example, the initial stage of aesthetic processing corresponds to low-level features of an artwork, such as contrast and color, while the later stages correspond to the viewer's interpretation of the meaning of an artwork (**Leder et al.**). Processing in a particular stage leads to specific outcomes. In the context of the *mirror model*, each of these stages corresponds not only to particular characteristics of the artwork, but also to specific processes that generated the artwork (see **Figure 1**).

The aesthetic experience of art begins with the perception of the surface features of an artwork and peaks when the viewer achieves a sense of having grasped an underlying meaning, context, or concept regarding the work that might have some personal relevance. According to the mirror model, this process involves a mirroring—in reverse succession—of the steps that generated the artwork. This mirroring process has both psychological and temporal components and may be conceived as a peeling back of the layers associated with the creative art-making process. The mirror model is primarily a cognitive model describing specific cognitive processes associated with the experience of art—both in its creation and reception. As will be described below, to take such a perspective allows empirical testing of the various aspects (and

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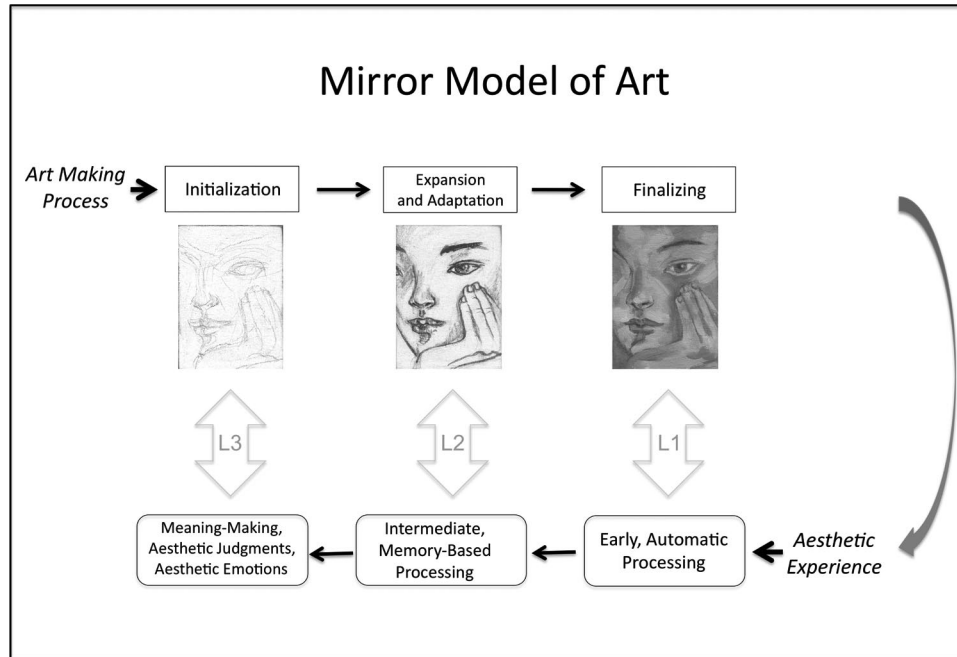


Figure 1. The Mirror Model of Art. L1, L2, and L3 represent the three levels of correspondences between art-making and art-viewing. The three images represent different stages of artist C. Barretto's creation of the painting *Untitled*, adapted for the purpose of the figure (see Supplemental Materials link on the first page for a full color version of the figure).

their interactions) of the model. It is important to note that although the model describes in detail both the art-making and art-viewing processes, emphasis is placed on their interaction. The mirror model is based on the idea that the fundamental nature of art-making and of art-viewing is related.

The following sections present a review of research relevant to the mirror model. Each side of the art experience—first art-making and then art-viewing—is discussed in light of empirical studies, recent theories, and other scholarship related to the psychology of art. Emphasis is placed on empirically derived results that shed light on the interface between how a creative idea is conceived and realized and how it is subsequently experienced aesthetically by a perceiver. Finally, the potential implications and limitations of the model are discussed.

### The Creative Art-Making Process

The creation of an artwork, in essence, involves transforming a concept into some physical manifestation, such as a painting. This process is complex and dependent on social and art-historical contexts and the past experiences, art-related knowledge, artistic skills, and motivations of the artist. The complexity is further magnified by the diversity in the methodologies, materials, and subject matter available to the artist. However, several studies (e.g., Mace & Ward, 2002) have identified practices and phases common to the creation of a variety of artworks. From these studies, we are able to derive specific stages that can be generalized to describe the art-making process. Because of physical (techniques for applying paint to canvas or shaping an object), material (characteristics of the paint or object), and procedural (need for an

underdrawing or compositional structure) constraints associated with the art-making process, even different types of artworks have these stages in common.

Locher (2010) has described two approaches that have been used to study these stages. The first approach involves *direct observations* of artists at work. This method has the advantage of allowing the researcher to obtain a detailed picture of the art-making process including the specific methods that an artist uses, the materials used, and the development and realization of various ideas and concepts. Moreover, direct observations allow researchers to document—often photographically—the different states of the artwork at various stages during its creation—from initial conception of an idea to its completion. Using this method also enables researchers to record how specific concepts applied, or actions performed, by the artist at an early point of art-making evolve during the entire creative process and how they are reflected in the final work.

The second approach to examining the art-making process is the *archival study* method (Locher, 2010). An example of this approach is the type of research often conducted by art historians. Archival studies focus on artists' working methods and the techniques and materials involved. They also help identify factors that influence the creative process. Such studies involve rigorous methodologies, and results that stem from them are typically corroborated by other scholars. Archival studies could also be supported by technical examinations, such as the use of infrared reflectography of the artwork under investigation (see Locher for a detailed description of the use of these technologies). The mirror model and its various components are illustrated using evidence derived from both archival studies and direct observations.

By making direct observations of artists at work, Mace and Ward (2002) have provided a rare glimpse into the real-world practices of professional visual artists and presented a comprehensive description of the art-making process. In their study, Mace and Ward interviewed 16 practicing artists about their working methods during the course of art-making—from the initial conceptualization to the completion of their works. From the data, they identified distinct phases of the art-making process. During the initial phase, ideas are conceived—whether explicitly or implicitly—and the artist selects an idea that is interesting and feasible to engage with as a potential art project. The idea may be implicit in the sense that the artist may not be aware of it until it is further developed. This development takes place during a phase where various aspects of the idea are explored, different avenues are pursued, emerging problems are solved, and relevant information is collected. During this phase, the artwork's formal qualities are outlined—its content and structure begin to take shape. The development of the physical organization of the artwork continues during the next phase of the process. Here, the compositional structure of the artwork becomes more fully established, and through a process of additional exploration, experimentation, refinement, and evaluation, it progresses toward final completion. The final phase involves finalizing the artwork and preparing it for presentation.

Based on research such as that by Mace and Ward (2002), and studies discussed in the following sections, the mirror model describes the art-making process as consisting of three broad stages (see Figure 1): *initialization*, which includes the conceptualization and physical translation of a creative idea and the development of the compositional structure of the artwork; *expansion and adaptation*, which involves development and adaptation of the initial structure of the artwork; and *finalizing*, which is the conclusion and final refinement of specific details of the artwork. Each stage contributes to the manifestation of an abstract concept into an artwork. In addition, each stage corresponds to specific methods used by artists to turn an idea into an actual artwork.

### Stage I: Initialization

The *initialization* stage, the first stage of the art-making process, corresponds to Mace and Ward's (2002) initial stages. The initialization stage is also based on results of other empirical studies, which show that the genesis of a concept and its initial expression as an artwork are closely linked (e.g., Weisberg, 2004). During the first stage of the mirror model, the artist initially explores an idea that he or she considers as being viable. There are several theories about how such ideas emanate. According to the *Darwinian perspective*, artists initially generate many variations of an idea in a free and unrestrained manner. From this set, one variant is selected to be worked on further (Simonton, 1999, 2007). An alternative perspective considers the generation of ideas as following a more systematic process that involves continuous and progressive development of a central concept (Weisberg, 2004; Weisberg & Haas, 2007). What these two perspectives have in common is the concept that artists generate a set of potential ideas. One idea is subsequently selected and initiated by exploring its various facets. Relevant information through research is also gathered. The artwork begins to emerge as its content and structure are initially explored.

As a part of the exploration phase during the first stage of *initialization*, artists construct numerous sketches—initial physical manifestations of an idea and representations that are influenced by artists' experiences and background knowledge, current influences, and emotional and motivational states. Through sketches, the artist is able to use visual artifacts to embody what has, until then, mainly been present in the mind. Sketching thus serves the development of the emerging idea. One source of evidence for the importance of sketching in the first stage of art-making comes from Weisberg's (2004) analysis of the creation of Picasso's *Guernica*, one of the most monumental paintings in 20th century art and a milestone work in the career of the artist (Penrose, 1981). Weisberg quantitatively analyzed the process that Picasso had gone through during the various stages of his creation of *Guernica*, beginning with the initial sketches. These sketches served two purposes: to map out the overall compositional structure of the painting and to determine its characteristics. The analysis showed that the sketches that determined the composition were numerous and used extensively during the very beginning of art-making soon after the concept of the artwork was conceived. The number of such sketches gradually decreased and gave way to sketches of specific aspects of the painting. Thus, there was a progression from working out the overall composition of the painting to outlining individual objects. Weisberg found that the compositional structure created through early sketching persisted during the course of art-making and eventually became the structure of the final *Guernica* painting.

The importance of sketching during the first stage of art-making is also evidenced by studies that have analyzed sketches produced by designers while solving creative design problems, especially those that were highly complex (e.g., Verstijnen, van Leeuwen, Goldschmidt, Hamel, & Hennessey, 1998). Jaarsveld and van Leeuwen (2005) examined the concept development strategies used by designers by evaluating the early and intermediate sketches that they produced during the creative design process. Their analyses focused on the introduction of, changes in, and stability of both individual object features and global compositional characteristics of each sketch. Results showed that individual design elements were introduced during the early stages of the design process and that these same elements were refined during the later stages. In addition, participants whose final designs received the highest quality ratings by art critics were more likely to have introduced the global structure of their design in their earlier sketches, which corroborates Weisberg's (2004) finding that the overall compositional structure is defined in the initial sketches.

Scholars have thus found much merit in studying the initial sketches and early versions of an artwork to gain insight into the various influences on the work and the physical, personal, social, and historical contexts in which it was produced. A few examples of such include Arnheim's (1962) in-depth study of the creation of Picasso's *Guernica*, Rubin, Seckel, and Cousins' (1994) detailed account of the genesis of Picasso's *Les Femmes d'Alger*, and Krumrine's (1989) comprehensive analysis of Cézanne's preoccupation with the subject of *Bathers*, a theme that inspired more than 200 individual works.

In painting, early sketching helps to establish the painting's underdrawing, which is an emerging visual representation that will eventually underlie the individual elements in the final work and the spatial relationships among them (van Cleave, 2007). In terms

of the different stages of the creation of a painting, the underdrawing serves as the organizing framework, a blueprint for the visual organization and compositional structure of the final work. It persists throughout the duration of the art-making process—from initial conceptualization of the idea to its physical realization (Weisberg, 2004). The process of establishing an early structure through the underdrawing has been used extensively by artists—even those who created works that had abstract elements. Cézanne, for example, used various media such as graphite during the early stages of painting to establish the key contours and basic composition in the underdrawing (Burnstock, Hale, Campbell, & Macaro, 2010).

The mirror model considers the related processes of sketching and establishment of the underdrawing as central to the first stage of art-making. However, it is important to note that not all artists make preparatory and exploratory sketches as described above. This is especially the case with particular artistic media (e.g., conceptual sculptures) and with the approaches of some contemporary artists. One example that stands out is Jackson Pollock's drip paintings. Pollock had a sense of the direction that he wanted to take with these abstract paintings without requiring preliminary sketches or drawings. He used an approach that allowed his ideas to be more directly and immediately expressed on the canvas (Pollock, 1950). This method of working was characteristic of Pollock's work near the end of his relatively short career, but it should be noted that before this, sketching played a significant role in his works. What is important to note is that whether or not sketches are involved during the initial phase of art-making, what is shared among artists is the process of generating an initial idea, exploring that idea, and working on that idea to the point that it finally becomes realized.

Another key aspect of the first stage of the art-making process is the appearance of what Arnheim (1954/1974, 1969) called an artwork's *structural skeleton*, which consists of "the configuration of visual forces that determines the character of the visual object" (Arnheim, 1954/1974, p. 93). It is a consequence of an artwork's various shapes, lines, and volumes—the fundamental elements of visual depiction available to the artist. It may be argued that the structural skeleton is not only established during the initial stage of art-making, but is the essence of the stage. "It is the guiding image in the artist's mind. . . . Whenever that guiding image is lost sight of, the hand goes astray" (Arnheim, 1954/1974, p. 93).

According to Arnheim (1954/1974), the structural skeleton does not necessarily physically coincide with the underdrawing, but together, the structural skeleton and the initial marks that compose the underdrawing represent the first actions of the artist to tangibly translate an idea onto a particular medium (e.g., canvas)—that is, the first physical layer of the artwork. It follows that the physical and visual elements produced in the first stage of art-making is temporally and conceptually closely linked to the major forces that inspired the artistic idea. This first layer is the crux of the artwork. It reflects more closely, and perhaps more directly than other layers of the work, the artist's motivations; personal and artistic influences; life experiences; relevant art-related knowledge and skills; and social and art-historical contexts in which the work was produced. As will be described below, there is an aspect of aesthetic reception that corresponds directly to this stage of art-making. After the initial expression of the structural skeleton and the establishment of the underdrawing, the art-making process

undergoes a transition (albeit seamlessly) to the next stage, where the artwork is further developed.

## Stage II: Expansion and Adaptation

The next stage, *expansion and adaptation*, involves the development and fine-tuning of aspects of an artwork that were established during the initialization stage. These can include the continued development of the underdrawing through addition, modification, and deletion of specific elements of an artwork and the introduction of such things as shading details. Weisberg's (2004) analysis of Picasso's creation of *Guernica* describes some of the characteristics of art-making included in the second stage of the mirror model. After Picasso established the structural composition and contents of the painting, he refined the various elements adapting his work to new information. Weisberg observed that during this stage "changes are relatively small-scale, and can be understood as responses to the demands of the evolving painting. They are more like modifying already-conceived ideas than a wholesale of something new" (p. 41). The expansion and adaptation stage thus involves changes stemming from demands that the artist might not have foreseen during the previous stage.

An additional source of evidence defining this stage comes from the creation of what many have argued to be the most significant painting of modern art, Picasso's *Les Femmes d'Alger (O.J.)* (Chave, 1994). Three reasons make the genesis of this painting an appropriate case for study. First, Picasso made numerous sketches and drawings that illustrate the preparatory work involved in making the painting, and importantly, many of these materials have been preserved. Second, most of the key phases of the creation of the painting were documented by photographs of the evolving canvas. Many scholars have used these photographs to obtain a glimpse into the processes involved in generating the painting. Third, several studies have used state-of-the-art imaging to study the layers of Picasso's actual canvas (Rubin et al., 1994).

One of the most common types of imaging technology for examining paintings is radiography. The technique is effective in enabling a detailed analysis of the layers of a painting. It allows the examination of characteristics of a painting that are invisible to the naked eye. Studies using radiography have recently yielded important information regarding the working processes of some of the most renowned artists and revealed changes they made to their paintings. An example of such a change is the act of painting over an already painted part of the canvas with a different visual feature or image (Dik et al., 2008). X-rays and similar imaging technologies are thus powerful tools for examining the different layers of artworks and how an artist's approach to the details of a particular painting changes. Findings from studies using such technologies will be used here to further describe the characteristics of the mirror model's expansion and adaptation stage.

Results of X-ray studies of Picasso's *Les Femmes d'Alger (O.J.)* show that the face of one figure included in the final painting is different from the underdrawing of that face. Compared with the underdrawing, the painted face is much more elongated and its profile angle is changed. In addition, the face, as depicted in the underdrawing, had an ear, a detail that was omitted from the final version of the painting (Rubin et al., 1994). These changes are consistent with the expansion and adaptation stage of art-making, where the outcomes of the initialization stage are adapted to new

demands that may emerge during the course of producing an artwork.

The process of building up and refining the groundwork of a painting can also be illustrated using results of imaging studies that have analyzed Cézanne's *Card Players* paintings, a series consisting of five canvases on the theme of peasants playing a game of cards (Ireson & Wright, 2010a). Recent infrared reflectography analyses of four of the five paintings in the series showed clear differences between the graphite underdrawings of the figures that Cézanne established at the outset of the work and the final versions of the figures after they had been refined. For example, Burnstock et al. (2010) observed the following in one of the paintings:

[T]hin 'pencil-like' lines roughly mark out the position of the sitter's proper left sleeve, and that these lines had been redrawn a number of times, as if Cézanne struggled to find the correct position for the sleeve and arm. Cézanne's free and sketchy underdrawing for this painting and others in the series suggests that he did not create a perfectly accurate composition at the outset (p. 43).

This observation also points out the artist's propensity to rework not only the overall composition, but also specific elements in the painting. In one of the paintings, X-ray analyses showed that a rough sketch of the head of one figure was widened in the final painting. Further analyses of Cézanne's working methods revealed modifications to the visual characteristics and positions of the bodies of the characters, their clothing, and the actual physical place in which they were depicted (Burnstock et al., 2010). These changes are in accordance with the expansion and adaptation stage of art-making.

The second stage of expansion and adaptation thus begins with the underdrawing and ends when significant modifications—typically through addition and deletion—have been made to an artwork's overall structural composition. Such modifications could be motivated by demands that emerge during the course of art-making. The expansion and adaptation stage is replete with changes and developments to the initial idea. As Mace and Ward (2002) put it, "Through this process of exploration and expansion the physical and conceptual artwork develop together. In this way the artwork undergoes a developmental process such that it often changes from the artist's original intention or glimpse they had when they first started it" (p. 186). Furthermore, an important aspect of this stage is the significant development of the characteristics of objects and subjects depicted in a work. At the core of the mirror model is the idea that characteristics developed during the expansion and adaptation stage correspond to specific processes that take place during an aesthetic experience.

### Stage III: Finalizing

The third stage, *finalizing*, involves enhancements and modifications that signal the completion of the art-making process. This stage may be considered as beginning when significant structural changes to the foundation of the artwork cease, a sign that the work is nearing completion. In other words, the processes that characterize the last stage pertain less to changes to the structural foundation, and more to fine-tuned refinements involving color, texture, and other subtle manipulations—enhancements applied to the surface layer of the artwork, the layer with which the viewer first interacts with the work. An example of this is the addition of

highlights to indicate areas of a painting where reflected light is represented, such as the shimmering of the surface of water. The last stage also includes specific steps taken by the artist to prepare the artwork for presentation. An example of this is the process of applying a type of treatment to the surface of the canvas in the form of a thin coating of acrylic gloss or varnish. Such substances serve the purpose of protecting the canvas from the potentially damaging effects of exposure to environmental factors such as ambient light, humidity, and chemicals in the air. This finishing process directly impacts the textural and surface characteristics of the painting.

The processes associated with the third stage may be illustrated by examining the working methods of Willem de Kooning, an artist known for his abstract paintings (Stevens & Swan, 2004). Although de Kooning's working methods evolved, consistently changing as a response to current demands, there was a pattern to his methods that remained constant throughout his career and across various works. Evidence of his working methods comes from infrared imaging examinations of his later works. These studies have revealed that following a period of conceptual development during the first stage of art-making, de Kooning created a series of charcoal underdrawings on the canvas. During the second stage, de Kooning continued to develop and refine these underdrawings. As final steps, he added color elements to the canvas and, characteristic of his abstract paintings of the mid-1980s (but which he rejected in his earlier works), applied a type of varnish that helped protect the surface of the work from potentially damaging elements (Elderfield, 2011). These last steps, which involves usually subtle yet important finishing touches, are consistent with the third stage of art-making.

Ireson and Wright's (2010b) study of one of Cézanne's *Card Players* paintings further illustrate the changes during the third stage: "At a late stage, he returned to certain forms, such as the men's knees and sleeves, emphasizing them by brushing in dark countouring lines" (p. 122). The finalizing stage typically involves minor modifications to the artwork, changes that mark the completion of art-making and the successful expression of an abstract idea through a creative product. A completed work of art, such as a painting, represents not only an idea, but also the development and evolution of the idea, represented by various layers of work.

As with most models that describe psychological processes in terms of stages, the present model presents art-making as a series of steps that are each characterized by a related set of processes. A critical aspect of the mirror model is the idea that artworks are imbued with layers of ideas as well as layers of materials that are deliberately set forth by an artist, an active agent with specific goals in mind. These layers reflect specific processes associated with art-making. During the first stage, an artistic concept is created, developed, and expressed through an artwork's compositional framework, which consists of the structural skeleton and the early version of the underdrawing. For representational works, the underdrawing contains a rough sketch of the objects and characters that are to be depicted; for abstract works, it may contain nonfigurative formal elements such as lines and contours. During the second stage, this initial foundational layer is built upon and refined with the application of more materials. Modifications to the work may be necessary to address emergent aspects of art-making. Finally, the work is finalized through the application of subtle enhancements and finishing touches that give the piece its final

character. During the course of creative art-making, specific processes are thus directly linked to layers of an artwork. Referring to one of Cézanne's paintings, Ireson and Wright (2010b) observed that "Areas of the canvas are worked up in different ways and these various types of layering, brushstroke, modeling and line, imbue the work with considerable visual energy" (p. 122). As the work progresses and each layer is developed, the complexity of the work increases.

The idea of layers corresponding with processes is central to the interface between the creation of an artwork and how it is experienced aesthetically. The essential argument represented by the mirror model is that the stages of the art-making process described above coincide with specific stages of the aesthetic processing of art described below. Related to this is the argument that the artistic concept that prompted the making of the physical art product is directly linked to the first stage of art-making, *initialization*. Thus, this stage may be considered the most significant of the stages in terms of the qualities that define an artwork and that make it distinct from all others, including those created by the same artist. Consequently, the last stage of the aesthetic experience of an artwork is also the most important stage. In other words, the most underlying layer is most significant in terms of both art-making and art-viewing. This idea is necessary to be able to account for the totality of the experience of art. As discussed previously, not accounting for this idea has led to the conceptual separation between art-making and art-viewing—between creativity and aesthetics.

### The Aesthetic Experience of Art

At the end of the 19th century, Gustav T. Fechner (1876) advanced an experimental psychological approach to aesthetics, which before then had been a field of study based mainly on philosophical inquiry. One of Fechner's most important contributions was the idea of *aesthetics from below*—a bottom-up approach that recognized how an art object's low-level perceptual features influence how the object is experienced aesthetically. Following Fechner's work, aesthetic experiences were seen as resulting from an interaction between bottom-up and top-down factors, top-down factors being the perceiver's attitudes, expectations, general knowledge, and art-related experiences. This idea has been behind the dominant approaches to psychological aesthetics and has been emphasized in recent conceptualizations of aesthetic experiences of art. Because the mirror model draws heavily on these conceptualizations, they are briefly reviewed in this section. A common feature in the various conceptualizations and frameworks is the concept that objects such as paintings are experienced through a sequence of cognitive processes beginning with the processing of low-level visual features (e.g., color) and culminating in higher-order cognitive operations such as meaning making and aesthetic judgments.

An influential framework of aesthetic experiences and aesthetic judgments was proposed by Leder et al. (2004) in their cognitive model of information-processing stages. They describe how, during an aesthetic encounter, and following the classification of an object as an artwork, the object is initially subjected to *perceptual analysis* of its low-level visual features (e.g., contrast). This is followed by *implicit memory integration*, where the levels of familiarity and prototypicality of the artwork to the viewer influ-

ence the aesthetic experience. These initial stages are automatic and occur without conscious awareness. Deliberate processing begins during the next stage of *explicit classification*, in which the contents of an artwork are identified. Perceivers who possess relevant art knowledge may also classify the style of the artwork during this stage. *Cognitive mastering* and *evaluation*, the last stages, are highly interrelated. During the cognitive mastering stage, the artwork is interpreted within the context of the perceiver's experiences and art-related knowledge. This interpretation is then evaluated in terms of how successful it is in providing increased understanding of the meaning of, and idea behind, the artwork. The outcomes during each of these processing stages influence the perceiver's overall aesthetic experience. More specifically, aesthetic judgments and aesthetic emotions associated with an artwork depend on the outcome of each stage and on the interactions among the stages. The first stages of Leder et al.'s model are thus implicit, and cognitive processes associated with them transpire automatically. The next stage involves explicit identification of the contents of an artwork (e.g., people and objects depicted) and perceivers could also classify it as belonging to a particular art historical style (e.g., Expressionism). In the final stages, art viewers attempt to understand the artwork, deriving meaning from it based on their current knowledge and past experiences. Aesthetic judgments and aesthetic emotions are also outcomes of the latter stages.

What can thus be drawn from Leder et al.'s (2004) model are three broad stages of processing: early automatic processing of low-level stimulus features such as color and contrast; intermediate memory-related processing that involves the identification of the content and/or style of an artwork; and late processing of the meaning of an artwork and understanding of concepts related to it. These three broad stages have been discussed—although represented using different terminologies—in other conceptualizations of the aesthetic experience of art. One example is Chatterjee's (2003) neurophysiological framework of visual aesthetics. The framework, which draws heavily on cognitive neuroscience research, illustrates how different facets of the aesthetic experience of art correspond to specific aspects of visual objects. The framework also draws from vision research, such as Marr's (1982) delineation of early, intermediate, and late visual processing stages. According to Chatterjee, artworks are processed like other visual objects during early processing in terms of properties such as color and brightness. During the subsequent stage of intermediate processing, small visual units are grouped into larger units—elements that define the identity of the object. Chatterjee's late stages of processing describe two features that make artworks distinct from other objects: visual properties that engage the viewer more intensely than other objects and affective responses that artworks are able to elicit in the viewer. As with Leder et al. (2004), Chatterjee identified emotions and a decision regarding the artwork as two outcomes of the aesthetic experience. Although Chatterjee's (2003) framework emphasizes visual perception in general, while Leder et al.'s (2004) model is more specific to artworks, both describe aesthetic responses in terms of three comparable broad stages of processing: automatic processing of low-level visual features; processing that involves access to the contents of memory; and processing that involves higher-order cognitions such as art-related interpretations, aesthetic emotions, and judgments or decisions regarding an artwork (see Vartanian &

Nadal, 2007 for a detailed comparison of Leder and Chatterjee's perspectives).

These three broad stages appear to be fundamental to aesthetic processing. This also seems to be the case for objects that are not traditionally classified as fine arts, but are nonetheless considered artworks. Locher, Overbeeke, and Wensveen (2010) proposed a framework that described people's interaction with, and aesthetic experiences of, consumer products and design objects. Their framework described the main components influencing the aesthetic experience: the object and its various qualities, the characteristics of the person interacting with the object, and other processes involved in the experience. Locher et al.'s framework suggests that the aesthetic experience of consumer products and design objects takes place in much the same way as with traditional visual art objects. Specifically, there is a progression from the automatic processing of low-level object features to memory-related processing and subsequent higher-order cognitions, the latter being influenced by relevant background knowledge and experiences.

What can be derived from the frameworks reviewed above (Chatterjee, 2003; Leder et al., 2004; Locher et al., 2010) are three broad stages of aesthetic processing that form the basis for the mirror model (see Figure 1). Furthermore, there is a progression from bottom-up to top-down processing—from low-level features to more complex higher-order cognitions. Specifically, during early processing, stimulus features such as color and tonality are processed automatically. This is followed by memory-dependent processing, where the perceiver's knowledge and background experiences are activated and consequently, objects depicted in an artwork are identified. Finally, late processing leads to outcomes that define the aesthetic experience of art, such as meaning-making, aesthetic judgments, and other outcomes that result from active, and often effortful and focused, cognition (e.g., Russell, 2003). According to the mirror model, the succession of aesthetic processing stages and the exact nature of each process correspond to specific stages of the creative art-making process. This approach allows the full manifestation of the aesthetic experience of art to be examined, from the creation of an artwork to its subsequent reception by viewers.

### The Interface Between Artistic Creation and Aesthetic Reception

The mirror model explicitly describes the *correspondence* between aspects of the art-making process—producing a particular artwork—and a perceiver's aesthetic experience of that artwork. The nature of this interface not only influences the aesthetic judgment and aesthetic emotions, two potential outcomes of an aesthetic encounter (Chatterjee, 2003; Leder et al., 2004), but also the extent to which an artist's concepts and messages are understood and deep aesthetic engagement with an artwork is experienced. The mirror model therefore builds on previous frameworks and proposes that the aesthetic processing of artworks is based on the mirroring of the creative art-making process. This perspective makes it possible to consider outcomes of aesthetic experiences beyond preferences, liking, and other responses that are based primarily on a simple approach-avoidance dichotomy. Viewing aesthetic experiences of art in terms of correspondences with the

creative process allows one to consider the richness and complexities that are associated with the experience of art.

According to the mirror model, each of the three stages of art-making described above corresponds to one of the three broad stages of the aesthetic experience. As shown in Figure 1, the model describes these correspondences in terms of three *levels*. Furthermore, the stage-to-stage correspondence has a mirror-reversed character wherein the aesthetic experience during an *initial* encounter with an artwork corresponds with the *final* stage of the creation—the surface layer—of that artwork. According to the mirror model, a typical aesthetic experience of a visual artwork proceeds as follows. The aesthetic encounter with an artwork begins at what the mirror model calls the Level 1 Correspondence (L1). At this level, the perceiver processes the low-level visual elements of the artwork. Such elements include color, texture, brightness, surface features, and other visual elements that are characteristic of the *finalizing* stage of art-making. To illustrate, as a final touch, the artist might add highlights to a painting to create an effect of light shimmering on the surface of water. Visually, highlights provide areas of high contrast, and high contrast areas of an image have been shown to be visually salient—they capture the viewer's attention quickly and automatically upon initial encounter with a visual stimulus (Itti & Koch, 2001; Itti, Koch, & Niebur, 1998). Highlights are therefore a good example of aspects of a work that are added last by the artist but processed first by the viewer. Processing at L1 occurs quickly and automatically and provides the viewer with an initial sense of the overall appearance of an artwork. This occurs in a manner similar to the creator of the work evaluating the final piece from a distance to ensure that every minor visual detail contributes to the overall appearance of the work.

The aesthetic encounter proceeds to Level 2 Correspondence (L2) during which the initial signs of deliberate processing appear and resulting outcomes for the viewer become more dependent on memory. At L2 the viewer processes objects and figures depicted in the artwork and the characteristics of the overall composition of the work. These are the elements refined by the artist during the *expansion and adaptation stage*, the second stage of art-making. Work during this stage also includes modifications made by the artist as a response to emergent issues—whether material or conceptual—that surfaced while the artist continued to work on the artwork. Here the viewer begins to deliberately evaluate particular features of the artwork, such as the posture or facial expression of a figure, and specific details of other depicted objects. At L2, these aspects of the artwork that are set forth by the artist become explicit to the viewer.

The last level, Level 3 Correspondence (L3), is the most significant in terms of a perceiver's deep engagement with an artwork. L3 represents the interface between the first stage of art-making, *initialization*, and the late processing stage of the aesthetic experience of art. On the one hand, the first stage of art-making is associated with the artist's initial motivation to express and transform a creative idea into a physical product: the artwork. Thus, the first stage of art-making is associated with the initial processes that generated the artwork. These initial processes are closely linked to the concept behind the artwork and embody what the artist was attempting to achieve artistically. On the other hand, the late processing stage of the aesthetic experience involves high-level processing. This includes complex cognitions such as meaning



making, aesthetic emotions, and aesthetic judgments of an artwork. These outcomes result from deliberate and effortful cognition and recruit the perceiver's knowledge base more than the previous processing stages. For example, the viewer might wonder about what the artist was trying to achieve in making the work. He or she might focus on particular features of the work and speculate on the artist's decisions. Additional information about the artist or the artistic process—whether presented along with the work as in a museum label or catalog, or knowledge possessed by the viewer—becomes crucial. Such information allows the viewer to experience the work within a larger context. Thus, regarding the correspondence at L3, aspects of the artwork established during the first stage of art-making interfaces directly with the art perceiver's life experiences and current emotional and motivational states. Recent evidence has shown that aesthetic experiences of artworks are inherently self-referential and that this manner of responding might be universal (Vessel, Starr, & Rubin, 2012). Aesthetic experiences of art are dependent on the information perceivers are able to infer regarding the creative art-making process and how such information interfaces with their knowledge base, personal characteristics, and current motivational and emotional states. The aesthetic experience, considered in its fullest manifestation—self-reflective, transformative, challenging, insightful, pleasurable, even repulsive—could therefore be considered as resulting from the processes that produced it.

Further evidence of this interface has been provided recently by Tinio, Smith, and Potts (2010). They found that visitors, during their visit to an art museum, reported expecting, needing, and actively seeking information about artists and the context in which their works were created—specific information that would help them make sense of, and connect with, specific artworks. Information, whether knowledge inherent in the perceiver or received while interacting with an artwork, facilitates L3 correspondence, which in turn facilitates a *connectedness* between viewer and artwork (Tinio et al., 2010). In this regard, the context of the art-making process, as communicated to the viewer, is crucial. Such a context includes information regarding the artist's life, his or her motivations and other impetus for creating the artwork, and how the artwork fits into general historical and art historical contexts. These considerations occur at L3, which is the level at which the art perceiver appears to be seeking a way to make sense of an artwork by going back to the earliest stage of the art-making process. This is the point at which the artist's idea was initially physically expressed and the time when the various contexts—personal, professional, social, and historical—within which the idea for the artwork was initially conceived made the most significant impact on the final product. It follows that this correspondence level should also have the greatest influence on the outcome of the aesthetic experience.

This idea is consistent with research on the dramatic influence on aesthetic experiences of art-related information presented during aesthetic experiences (e.g., Belke, Leder, & Augustin, 2006; Millis, 2001; Russell, 2003; Russell & Milne, 1997; Smith & Carr, 2001; Temme, 1997). Simply put, the more appropriate information available, the more remarkable the aesthetic experience. Thus, aesthetic experiences that are powerful and transformative are not based merely on the viewer's engagement with the visual features of the artwork—whether related to content or formal elements—they are also based on the viewer's engagement at L3 with the

artist's processes, motivations, and personal experiences expressed during the first phase of art-making.

## Discussion and Conclusion

There are countless ways to experience art, and the nature of each experience depends on factors such as the features of the artwork; the viewer's personal characteristics, current motivational and emotional states, art-related knowledge, and past experiences; the physical context in which artworks are viewed; and societal and historical factors such as current fashions and trends (Jacobsen, 2006). Thus, aesthetic experiences vary tremendously in terms of the nature of a viewer's engagement with an artwork. In the simplest sense, a person with little knowledge about art could walk into the Louvre, see the *Mona Lisa*, and walk out checking off the experience from a *to do list* during a short trip to Paris. Alternatively, a person who is interested in, and highly knowledgeable of, art might make a special visit to the Louvre to see the *Mona Lisa*, engage with it deeply, become fully immersed in the activity (Csikszentmihalyi, 1990; Csikszentmihalyi & Robinson, 1990), and leave with a sense of being deeply moved by the experience (Pelowski & Akiba, 2011; Smith & Smith, 2001).

The mirror model allows for new predictions and reinterpretations of art-related issues that scholars have examined extensively in the past. One such issue concerns the influence of art expertise on aesthetic experiences (e.g., Cupchik & Gebotys, 1988; Hekkert & van Wieringen, 1996). Demographically, we often consider art experts as those who have received art training—whether in art history or art-making—and who engage frequently with art in their daily lives and during visits to galleries and museums. Although both art experts and nonexperts may experience art through all three of the mirror model's correspondence levels, studies have shown that compared to art novices, art experts are more comfortable with viewing art and are more deeply engaged with aspects of the creative process. For example, Pitman and Hirzy (2010) found that art experts are not only interested in understanding what is depicted in a particular artwork, but also in the corresponding processes and materials used by the artist as well as the personal, societal, and historical influences that undoubtedly would have impacted the creative process. These results suggest qualitative differences between different individuals when it comes to the cognitive processing of, and level of engagement with, art, and that these differences are linked to the amount of emphasis placed on the art-making process. Also relevant to the mirror model are recent studies that have shown that art experts are affected emotionally and intellectually by art to a greater extent than nonexperts (Leder, Gerger, Dressler, & Schabmann, 2012).

The mirror model provides a novel explanation for the interindividual differences discussed above: they are due to both the amount of art-related knowledge and *how* such knowledge is applied during aesthetic experiences. Specifically, expert processing is characterized by more numerous *iterations* through the correspondences (i.e., cycles through L1 to L2 to L3). The higher the number of iterations, the greater the engagement with an artwork, and in turn, the greater the need to consider the processes that generated the artwork. Although this remains to be tested, previous frameworks have discussed similar processes through the idea of feedback loops. For example, Leder et al. (2004) proposed that when the outcome of an aesthetic experience is not satisfac-

tory to the viewer, the viewer might revert to earlier information processing stages. Also, the quality of this feedback loop depends on specific art-related knowledge. This may involve knowing the particular style of art and the art-making processes associated with such style.

The mirror model and previous works (e.g., [Arnheim, 1954/1974](#); [Weisberg, 2004](#)) describe the art-making process as involving the establishment of a structural framework that is later developed in successive stages. It is important to note that there are a few visual features—such as symmetry ([McManus, 2005](#); [McManus, Edmondson, & Rodger, 1985](#)) and visual balance ([Locher, 2003](#))—that are not subject to successive development. These features can be established during any stage of art-making and could have an impact at any time during early, intermediate, and late aesthetic processing stages. Symmetry, for example, is established early during the art-making process when the structural framework is being developed. It is processed both automatically upon initial encounter with an object ([Tinio & Leder, 2009a](#)) and consciously and deliberately during the subsequent stages of aesthetic processing—when the concept and meaning of an artwork are derived. Symmetry represents a special case as most characteristics of artworks are developed in successive stages as described by the mirror model.

The mirror model could be applied to the study of the experience of artistic media other than the visual arts, such as writing, photography, or music. For example, for the aesthetic experience of music, there seems to be a progression of processing stages similar to those described for visual arts. [Koelsch and Siebel's \(2005\)](#) neurocognitive framework of music perception includes different stages of auditory processing. A careful examination of the various facets of the framework reveals that the aesthetic experience of music is very similar to that of visual arts and design objects. With music serving as the input to the system, initial processing involves the extraction of low-level sound elements such as pitch, timbre, and intensity, followed by grouping into units such as melody, and analysis in terms of time intervals. Following this initial processing, musical structure or syntax is processed. These early processes occur automatically and have an influence on emotional experiences and higher-level processing such as meaning making. Hence, there is a parallel between the succession of processes involved in the aesthetic experience of music and the aesthetic experience of visual arts and design objects. The question that beckons is what the parallel is between the art-making processes in music and the visual arts, especially with regard to layers of processes as described by the mirror model. If there is such a parallel, then correspondences at different levels may also play a crucial role in aesthetic responses to music.

Thus, across different art media, the mirror model represents the steps involved in both creative art-making and aesthetic experiences and how these steps are related. Each side is represented by three stages that were derived from the results of empirical studies. It is important to note that each stage in the model could be broken down into substages that involve similar processes. Therefore, the mirror model should be viewed as a structured summary of the entire and often lengthy and dynamic course of art-making and art-viewing.

The mirroring process that occurs in art creation and art perception was alluded to in [Tinio and Leder \(2009b\)](#) and [Tinio, Leder, and Strasser's \(2010\) taxonomy of image manipulation](#)

*procedures*, a framework that conceptualizes experimental manipulations used in aesthetics research in terms of how the manipulations impact the perceiver. The taxonomy comprises three types of image manipulations. *Surface-level manipulations* are changes that are applied globally across the entire image area. These include modifications to an image's sharpness, noise, and color characteristics. Such changes often cannot be detected, and perceivers respond to them automatically. *Composition-level manipulations* involve changes to an image's structure, such as cropping performed on the boundaries of an image thereby influencing its symmetry and complexity. Finally, *semantic-level manipulations* consist of changes to the content of an image—what is depicted. Such changes are dramatic because fundamental elements are removed and altered or new elements are added. Tinio and Leder's taxonomy describes how these three specific types of experimental manipulations correspond to three particular sets of aesthetic responses. An important parallel can be drawn between experimental manipulations (by the researcher) and specific sets of processes during art-making (by the artist). It appears that the correspondences, as described by the mirror model, have some grounding in the methods that have been used to study aesthetic responses since [Fechner's \(1876\)](#) early research.

As a field of study, the psychology of the arts must build upon what has been learned from a century of examining how the visual characteristics of artworks influence their perceivers. As this accounts for only a part of the totality of the art experience, we must try to recover the rest. The mirror model is an attempt to create a bridge between the art-viewing and the art-making. However, studies are needed to test the various aspects of the model using the tools that have been developed during the history of research on both aesthetics and creativity. These tools include behavioral, physiological, and neuroscientific methodologies. Without a doubt, much has been learned from our emphasis on the hedonic aspects of art. In fact, results derived from this body of work form the majority of our knowledge of the experience of art. Research on preferences and liking are crucial, as they address important aspects of the aesthetic experience. However, as [Silvia \(2005, 2009\)](#) and [Silvia and Brown \(2007\)](#) have pointed out, the focus on hedonics has led to the neglect of other types of responses. As a consequence, our previous practices have placed constraints on our view of the fullness and complexities of the experience of art. The mirror model attempts to expand on this idea by claiming that to account for the experience of art in genuine aesthetic encounters, the reception of art should be linked to the creation of art. It makes sense intuitively to consider the creator of art when art is fundamentally about creation ([Tinio & Leder, in press](#)).

One potential outcome of closely linking the aesthetic experience of an artwork to its creation is greater focus on promoting a more dynamic engagement with the work. For instance, a person viewing one of de Kooning's abstract, black and white paintings from the late 1940s might dislike the painting (or find it uninteresting) at first glance. The initial low-level engagement could perhaps be made deeper if, for example, the viewer is informed that the painting was made using ordinary household enamel paint instead of the usual, although expensive, oil-based paint because de Kooning was in deep poverty when the painting was made ([Elderfield, 2011](#)). Viewed in this context, de Kooning's effort could be deemed inspirational and could suggest to the viewer the

artist's ability to overcome material constraints—an indication of his mastery of his craft. Similarly, someone looking at one of Picasso's paintings of a voluptuous nude young girl from the early 1930s might, on the surface, find the work fun, lively, and very attractive. If told, however, that the painting's model, Marie-Thérèse Walter, was a minor with whom Picasso was having an extramarital affair (Penrose, 1981), the viewer might find the painting offensive and distasteful. Knowing about the context of a work or aspects of the art-making process thus has the potential for facilitating dynamic and enriched aesthetic experiences.

For art museums and galleries, enrichment of visitors' aesthetic experiences is a primary concern. The most common method for enrichment is to provide information about the technical aspects of an artwork (e.g., the medium), its provenance, and related art historical information (e.g., its particular style). This information is intended to help visitors gain "access" to the artworks and promote deeper engagement with the works. The effectiveness of this method is limited, however, because visitors often need more information than typically provided on a label or wall text to experience deeper engagement and personal connectedness with the works (Tinio, Smith et al., 2010). The mirror model could serve as a guide for better structuring the museum experience. According to the model, artistic creation and aesthetic reception are fundamentally related. One way that this concept could be applied in the context of a museum is using an approach that places emphasis on the different levels of correspondences. Such an approach would entail not only greater focus on the artist and the process of creation, but also on how these two aspects are linked to the cognitive processes experienced by visitors. The implications of this approach extend beyond the museum to art and aesthetics education.

The mirror model suggests that during an encounter with an artwork, perceivers recapture some of the thoughts, concepts, and emotions of the artist, and that the perceivers reinterpret these within the context of their current motivational states, emotions, thought processes, and viewing environments. Similarly, the artist might have the viewer in mind while creating a work. During this process, the artist could envision what the viewer's reactions will be to the work. Taken together, these two ideas—the viewer recapturing aspects of art-making and the artist imagining the viewer—could suggest a fundamental feature of art: that this two-way conversation is what distinguishes artworks from other objects in the world. It is this conversation between artist and viewer that future research must explore.

Not considering both the creative and aesthetic processes together thus limits our ability to understand the art experience in its fullest extent. The mirror model accounts for the link between the two sides of the experience of art on the premise that an artwork is an artwork not only because of what it looks like or how it is classified, but also *why* and *how* it was created. With this idea as a background, the viewer may be seen as not only trying to determine the visual characteristics of an artwork or attempting to understand its meaning, but also searching for ways to discover the many different processes that transpired when the work was created. The mirror model considers this correspondence as essential if one is to realize the full manifestation of the aesthetic experience.

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