Timing Perception in Paintings and Sculptures of Edgar Degas

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Abstract
The impressionist artist Edgar Degas (1834-1917) is widely known for his artistic production dedicated to the representation of movement. Degas has done a careful study, realistically depicting the movement both in his paintings of scenes of horses, women bathing and dancing, and in his sculptures of dancers in various positions of classical ballet. Since movements exist only at the intersection space-time, and visual works of art exist only in physical spaces defined by the works themselves, this article discusses the perception of time in the work of Degas. Therefore, this paper emphasizes aspects of the representation of movement used by the artist and the implied relations of these aspects with the perception of time. The timing perception is addressed according to studies that revealed components of the subjective perception of time related to a meeting of an observer with a work of visual art (aesthetic episode).

Keywords
Timing, subjective time, visual arts, movement, Degas

The Temporality in Edgar Degas’s Paintings and Sculptures
Several pictures of impressionist artist Edgar Degas show dancers and women bathing, performing movements that became repetitive and habitual. These works portray lapses of time indoors, revealing studies of body movement that underscore the inherent temporality of impressionistic painting. Degas’s genius consisted precisely in his ability to capture, record and produce snapshots of scenes hitherto impossible to represent realistically.

1 In this essay the only issues discussed were those concerning the representation of movement in the work of Degas. To better understand social aspects showed in his work, brilliantly deployed in his paintings, see Anthea (1995) and Kendall and Pollock (1992).
Degas studied photographs to reveal aspects or moments of the world beyond the three-dimensional (Argan 1995). The use of photographic records allowed Degas to make visible in painting things that the eye cannot see (for example, intermediary movements of a ballerina performing turns and pirouettes on stage) providing snapshot images where sight and mind have not been able to separate the thing that moves from the space it inhabits. Photography revealed real images made visible in the instant of their production, the moments, the instants, the passing time captured in photographic clicks of time: it showed time in the world in a way hitherto unimaginable. The possible objects of study of the impressionist, the unusual framing, the details impossible to be highlighted in a painting or interesting details that went unnoticed, all marked a time when the pictorial representation could no longer be restricted to a scene or to a temporal interval with a plot. The painting could also record what happens in the here and now, that which has just happened or is about to happen.

The photo can show a moment and the painting a summary of the movement, because a figurative painting is related to the narrative. The scenes painted by Degas have been thoroughly studied (e.g., Growe 2001; Strickland 2004) in terms of their composition marked by a three-dimensionality. The human figure is highlighted at the time of a movement interruption that freezes the person in careless positions. Large empty areas fill the spaces of his paintings and move the observer away from the main part of the scene, inviting her eye to limn the movement of the body paralyzed in its motion. For example, in *The Dance Foyer at the Opera on the Rue Le Peletier* painting, the ballerina in the foreground of the scene is positioned in a way to indicate the probable performance that she must execute according to the instructions of the teacher, who is positioned on the other side of the dance class.

Timing is an essential component of Degas’s works. Unlike other impressionists, Degas did not limit himself to painting or representing the instant perception of reality around him: he further fragmented the course of events, depending on a composition marked by overlapping pictures and empty spaces in oblique angles, conditioning not only a manner of seeing from two perspectives, but the very nature of the content of the painting. Degas summarized more than a present time in his themes. The apparent temporal duality expressed in his paintings can really be represented in a started or completed

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2 Reproductions of Degas’s paintings cited in this article can be viewed on the site www.edgar-degas.org. Link of this painting is http://www.edgar-degas.org/The-Dance-Foyer-at-the-Opera-on-the-rue-Le-Peletier,-1872.html.
movement in real time: “...the structure of time in the painter’s moments is profoundly ambiguous, containing the dynamic movement and its paralysis, the most extreme transitional and the most complete rigidity” (Growe 2001, 52).

At the same time that his painting sets the ephemeral moments representationally, it can also report to the observer moments and time lapses of different durations, depending on human harmonic movements, rhythmic or sequenced as the steps of a classical ballet.

Degas’ dancers, on the one hand, can be understood solely as objects or fragments of a pictorial construction of movements, because they are also used to reveal the transitional (time) within what is solidly structured (substance). On the other hand, Degas’ dancers can also be understood as movement and object, action and body, representation and perception, in other words, the subliminal perceptual of actions executed. His compositions evoke temporality according to the internal movements that they generate in the observer.

Hence, his paintings are closely associated with a temporality variable, depending on a calculated and structured composition, which combines movement, the vacuum and overlapped fragments of figures in positions that induce the eyes to pursue the space demarcated by Degas himself.3

What about his sculptures of dancers? Sculptures, isolated from other elements and held in a three-dimensional world, occupy an inherent vacuum of their own. Degas dealt with the representation of movement in these three-dimensional static objects in ways that further elucidate his notions of the temporal experience. Degas used a sectional view (various frames) in his paintings, which at the same time refused and demanded a whole in which to ground the represented movement. In his wax sculptures the instability of his creation mirrored the evanescence of movement. He demonstrated the importance of balance in dance, which in sculptural terms represented its almost impossible human movements. He sculpted the tension between the elongation of the body and a latent downfall (Growe 2001).

Compared to his paintings, which can acquire movement in the distortion of forms, in perspective, and in the illusory impossibilities which are characteristics of the transposition of figures to the two-dimensional world, in the sculptures the extension of the dancers’ bodies creates a sense of balanced volume isolated from the other forms around them. Since they occupy a space

3 In the painting *The Dance Foyer at the Opera on the Rue Le Peletier* this can be observed in the three main frames of a ballet classroom composition focusing one ballerina distant from the teacher by a large empty space. The scene leads the viewer’s eyes to explore the painting revealing the other dancers’ actions positioned behind the foreground of this scene.
that can be ‘cut’ through the eyes from various angles, the sculptures demand an integrity disconnected from the space they occupy. As objects, they must exist and contain their movement-time in a real and virtual physical space simultaneously. In Degas’s sculptures, the movement also becomes a logical consequence of the sum of the parts such as area, volume and time, because the artist developed the spatial qualities out of their carved movements. See, for example, the sculptures 9 to 11 (attitudes) and 12 to 15 (arabesques) which show dancers performing positions that require a great corporal domain for the execution of these movements (Figure 1, below).

While there is a physical space, the sculptures of dancers also have their parts happening in a temporal space of short lapses of time as a function of the observer’s eye motion. In this sum of parts, the whole visual has its components (positions and twists of arms, legs, trunks and necks) processed cognitively as movements according to the volume, balance and space occupied by each sculpture.

In sum, it is impossible to appreciate Degas’ works without the special timing experience which is essential to following the narrative aspect of his works.

Subjective Time Perception in Visual Arts

Time is an essential element for human self-direction and intentionality and certainly a fundamental parameter of their personality as it combines internal and external feelings and perceptions. Time has been studied through states of consciousness that examine sequenced events between present and past and intervals between successive events. The experience of time can be understood, on one level, as a manifestation of a process of temporal information, and several researchers have emphasized a subjective component in temporal perception (Allan 1979; Block 1990; Eisler 1976; Fraisse 1967, 1984; Michon and Jackson 1985; Zakay 1990; Zakay and Block 2004).

The measure of subjective temporal experience and its relations with events in the objective world depend on the context in which these experiences are inserted. Thus, in researches of subjective time, the nature of stimulation, the characteristics of the time interval examined, as well as its intensity and modality may involve different time processing that may result in changes in temporal estimation upwards (overestimation) or downwards (underestimation) (Block 1990).
Questions about the temporal estimation of the perception of visual stimuli revolve around time allocated to discrete aspects of a drawing, painting, or sculpture. Would there be specific parts or areas of the work where the eyes remain for a longer time in a drawing, painting or sculpture by Degas? Do the ballet scenes encourage viewers to read in a narrative context? To understand this element of engagement, one needs to know where one's eyes rest at any moment during the perusal of an artwork, in this particular instance of a Degas, and the relationship between this look and the time interval spent by the individual.

Nather and Bueno (2006a), examining subjective time perception and perception of movement in art works, showed that the study of images in movement as well as those static images representing some movement contributes to understanding the role of time as a modulator of human experience. Different forms of representation induce differing movement stimuli; distinct works of visual art involve not only specific techniques but different forms of interaction which only occur when there is an encounter between the work of art and the spectator.

For Cupchick (1976), the time interval (the experience of temporal duration) varies directly with the processing of the artistic complexity of stimuli in an art work. According to this author, the higher the number of images, changes or mental contents experienced by the observer, the slower time is perceived to be, leading to temporal overestimation. Cupchick and Gebotys (1998) found that the exposure time of subjects can vary not only in light of the pictorial characteristics of the works of art and how pleasurable they were judged to be by the participants, but also on the time of exposure of a work to a subject. For these authors, who used works by Degas, Manet and Monet in their experiments, the duration of an aesthetic episode determines how long an observer spent on cognitive activities and understanding of a piece.

In this sense, the representation of movement in a static image (painting, photography etc.) would be a significant parameter during an aesthetic episode, as it may have different indicators of representation of movements used by the artist (Braddick, 1995; Cutting, 2002). It would excite various states of perception in the observers related to the world that surrounds us.

The comparison of photographs of two objects (dolls)4 representing dancers (one sitting and another standing in ballet position) showed that the dancer

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4 The doll photographs were obtained from the original work produced by Nather (2004). This work is composed of six pairs of dolls fully painted with single different color varnish (white, pink or shades of red). The dolls were originally ‘frozen’ in different intensities of
who was sitting was observed with shorter temporal duration than the one who suggested the expectation of a jump (Nather and Bueno 2006b). This would suggest that images with greater expectation of movement have temporal markers or more reference points for the eyes. These markers in the whole (gestalt) may account for the differences in temporal estimation.

This notion offers a productive means to interpret and understand the extensive work of Degas, which was able to faithfully portray scenes in a narrative that implicitly contained movements occurring in a predicted or sensed time. For example, *Two Dancers in the Studio* and *Two Ballet Dancers*, paintings depicting dancers in different stages of a ballet class, were estimated with the same time duration by individuals not trained in ballet and visual arts. It is important to point out that the narrative of these two paintings can suggest different *time periods* or *moments* of a ballet class. *Studio* shows in the foreground a ballerina dancing on tiptoe and in the background another dancer probably getting instructions from the ballet teacher. The pictorial construction of this scene shows a diagonal construction of a ballet class: a teacher making the viewer’s eye move from the back of the painting to the forefront. In the other painting, which shows two dancers sitting and curved over the legs in the back of a classroom, the postures of the dancers were judged by half of the participants as representing dancers preparing (stretching) before a performance of ballet, whereas for the other half they depicted a moment of rest after the training class.

The literature has shown the relationship of the works of this important impressionist from the standpoint of the movement that he portrayed (Argan 1995; Growe 2001; Marques 1999; Strickland 2004), but it might be that he was also interested in portraying the implicit times of the movements he represented. To clarify this, it is important to comprehend the temporal aspects implicit in all his work.

To gather more information on the subjective perception of time from people who observe works of visual art, Nather (2006) and Nather and Bueno (2005, 2006b, 2008, 2011) worked with paintings and sculptures of Edgar Degas’s dancers, according to the guidelines of the *New Experimental Aesthetics* (Berlyne 1974). We concluded, in a series of experiments, that the works of movements, and exposed in pairs. These art works appeared in the “Paulista Cultural Map” (Edition 2003/2004) exhibited at the Cultural Center Oswald de Andrade in São Paulo, Brazil.

7 According to the *New Experimental Aesthetics*, an art work transmits information in accordance with the sum of its components and characteristics (symbols). Information content
Degas emphasized different aspects of subjective perception of time, indicating that movements represented in themselves lead to varying degrees of subjective perception of time.

**Experimental Analysis of the Subjective Perception of Time in Degas’s Paintings and Sculptures**

For Degas, “drawing is a way of thinking, and shape is another” (Strickland 2004, 107). In addition, since a painting is not only a visual sensory stimulus but something that happens in the mind subjectively, similar processes of perception and cognition should be triggered by sculpture, and much may be accomplished by looking broadly at his work in all media.

Research on Edgar Degas’s work suggests that timing perception can be altered by particular characteristics of the works examined (Nather 2006; Nather and Bueno 2011). In these studies, different images of dancers in positions of larger and smaller intensities of movement were presented in a series of three and four images. After the display of each work, participants estimated its exposure time. The temporal estimations of 172 university students that reported being untrained in visual arts and in ballet were obtained in accordance with the prospective paradigm using the subjective time reproduction method (Block 1990). Each one of the digital photographs of ballerina sculpture pictures (Figure 1, sculptures 1, 2, 6 and 15) were randomly presented for 36 seconds each on the screen of LG Flatron monitors (30 cm wide by 40 cm high) to the participants in two experiments. They were positioned so as to face the central region of the laptop computer screen at a fixed distance of 50 cm. The statistical analysis of mean time reproduction values by the participants confirmed the general tendency observed in previous experiments. Overall, the ANOVA statistical analysis showed that the exposure to images of dancers with more body movement representation were estimated to be of longer temporal duration than those with less body movement representation, even though the display time for each one of them was always the same.

implicit in the art work, including collative properties, can be described in relation to its expression, culture, syntax and semantics. Thus, although considering an art work as a stimulus, this approach considers what an aesthetic work represents in terms of its own content and of what is in its surroundings, i.e., of what it represents beyond itself.
The use of the paintings *Dancer with a Fan*\(^8\) (which depicts a dancer standing up holding a fan) and *Dancer Posing at a Photographer’s Studio*\(^9\) (a dancer standing up in a ballet step facing what seems to be a mirror) emphasized one important aspect related to temporal perception and, more specifically, related to the work of Degas: the two paintings were estimated with similar temporal durations (Nather 2006).

Perhaps, although these paintings show dancers in different movements, both seem static and frozen in their bodily positions, in distinctly occupied spaces in two different scenes. It is likely that the large areas inhabited by these solitary dancers overcome the movements of their bodies because they lead the observer to those moments intentionally determined by Degas. In these paintings the observers are also influenced by the main shades (yellow and blue), because these are important pictorial parameters in visual arts generating, for example, different hedonic values in the observer.

Expressive qualities of movement are connected to what we know about their meaning (Arnheim 2004). According to Arnheim, the photograph of a dancer gives the observer dynamic properties because the position of the body in a pose of ballet is perceived as a deviation from the normal. More than reference points for the eyes, the parts of the body not only direct the eye, but also show what the body is doing: in *Dancer Posing at a Photographer’s Studio*, the dancer’s arms are not directed at the top, but raised as in a specific step of classical ballet suggesting that some properties and functions of the body constitute an inseparable part of its visible character. This helps explain why values of different temporal estimation have been found when the painting of the dancer in this picture was ‘removed’ from the rest of the scene. In relation to the original Degas’ painting this experimental treatment foregrounded the ballerina who occupies the background in the Degas painting. This reorientation stressed her body position in a way not unlike the ballerina in *Dancer with a Fan*. Apparently the positions of the body of this dancer were strong enough to generate greater temporal estimation. *Dancer Posing at a Photographer’s Studio* with its movement was estimated with longer duration than the more static *Dancer with a Fan*.

One might suspect intentionality on the part of the artist to sculpt movement representing it in the intensity that he specifically wanted. When changing to three-dimensional works of art, the artist might not have needed to rely on pictorial elements of representation and movement inherent to the

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two-dimensional pieces. The bodies carved by Degas themselves seem to invite the observer to perceive movement represented independent of artistic resources like composition, shade, and saturation that a painting could provide.

In order to quantify the intensity of carved movements in the sculptures of Degas’ dancers, Nather and Bueno (2008) have developed a “Body Movement Ranking Scale” (BMRS) from photographic images of 16 sculptures from the collection of the São Paulo Art Museum (Figure 1). The photographic reproductions of sculptures were randomly and individually presented on white paper to 28 participants: 14 dance-trained and 14 untrained participants. After the exhibition of each image, each subject was asked to fill out a Semantic Differential Scale, responding to a Likert questionnaire item: participants specified their level of agreement or disagreement on a symmetric agree-disagree scale (7-points) for a statement about perception of movement on the image. Dance trained participants also responded a question about the ballet step represented by the ballerinas.

Following the dancers’ scores, the sculptures were grouped according to their major ballet positions (arabesques and attitudes; sculptures 9-11 and 14-15) and their dance steps (as cambré, chassé, degagé etc; Sculptures 2, 3, 5 and 8); other dance steps (Provençal dance and Spanish dance; sculptures 6 and 7) and dancers resting or doing other movements (massaging their knees, looking at their right foot; sculptures 1, 4 and 16). Markedly, the greater the bodily effort represented in dancers (arabesques and attitudes), the higher their scores of movement; connection steps received intermediate scores and still dancers received the lowest scores.

Obtaining separate scores for the different ballet steps represented by Degas only seemed to confirm what the literature reports on this exceptional artist with the ability to create art works representing movements of different intensities. Moreover, another latent and implicit aspect of his work can still be highlighted suggesting that the observers lived the movements performed by the bodies of his dancers. Degas’ work transcends its own aesthetic, becoming something that actually interacts with the observer. Beyond engagement with the carved movement, there is also a movement subjectively designed by the observers.

In another study, Nather and Bueno (2011) used the sculptures 1, 2, 5, 6 and 15 (Figure 1) to verify if movements with different scores would alter differentially the temporal estimation of people not trained in the arts and classical ballet. Sculptures 1 and 2, with less movement represented (Ballerina in Repose with Her Hands on the Waist and Her Left Leg in Front and Ballerina in Repose with Her Hands on the Waist and Her Right Leg in Front), were judged
Figure 1. The 16 sculptures (stimuli) used in the experiment, which represented different body positions and ballet steps suggesting movement in distinct intensities: 1) *Ballerina in Repose with Her Hands on the Waist and Her Left Leg in Front* (facing forward); 2) *Ballerina in Repose with Her Hands on the Waist and Her Right Leg in Front* (facing to the right); 3) *Ballerina in Repose with Her Hands on the Waist and Her Right Leg in Front* (facing to the left); 4) *Ballerina Rubbing Her Left Knee*; 5) *Prelude to Dance, with Her Right Leg in Front*; 6) *Spanish Dance*; 7) *Ballerina with a Tambourine*; 8) *Ballerina Advancing with Her Arms Up and Her Left Leg in Front* (first study); 9) *Fourth Position in Front on the Left Leg*; 10) *Fourth Position in Front on the Left Leg* (second study); 11) *Fourth Position in Front on the Left Leg* (third study); 12) *Arabesque over the Right Leg with the Left Arm Placed in Front*; 13) *First Stage of the Great Arabesque*; 14) *Second Stage of the Great Arabesque*; 15) *Third Stage of the Great Arabesque*; 16) *Ballerina Looking at the Bottom of Her Right Foot*. Information facing forward, facing to the right and facing to the left was added to titles of the sculptures of ballerinas in the in-repose position with the purpose to differentiate them and facilitate text writing. Sculptures titles used in this study were adapted from the original titles in French. © Edgar Degas. Paris, France 1834-1917. Collection of MASP, Museu de Arte de São Paulo Assis Chateaubriand. Photos of João L. Musa.
as lasting less time than sculptures 6 and 15, which had more movement (Spanish Dance and Third Stage of the Great Arabesque respectively), even though the exposure time of each one was the same. Similarly, Spanish Dance was estimated as having less duration than Third Stage of the Great Arabesque. Prelude to Dance, with Her Right Leg in Front (sculpture 5) was estimated as having duration similar to Ballerina in Repose with Her Hands on the Waist and Her Right Leg in Front and Spanish Dance because, it would seem, as its name says, Prelude represents a beginning of bodily movement.

The movements represented in these sculptures also caused other changes in the subjective perception of time by participants in the study. When the values of their temporal estimation were compared with the actual length of presentation, Ballerina in Repose with Her Hands on the Waist and Her Left Leg in Front and Ballerina in Repose with Her Hands on the Waist and Her Right Leg in Front were temporally underestimated, Spanish Dance was estimated with temporal duration similar to the real time of exposure, and Third Stage of the Great Arabesque was temporally overestimated. This suggests that the pieces viewed give rise internally to a mental unfolding of movement that affects the perception of the here and now.

The Subjective Time Representation in Degas’s Dancers

The sculptures in given ballet positions synthesized movements at maximal points of dynamic space in terms of carefully poised physical objects, and, further, cause in the observer an unstable temporal balance. Degas’ research surpassed the visual sensation, revealing psychological moments or human situations that the eyes could not register without the will of cognitive thinking, revealing that the visual sensation is not a superficial phenomenon, but a real structure of thought (Strickland 2004). More than that, it is impossible to consider this cognitive aspect without the assumption of timing processing and the subjective representation of reality.

The numerous images of ballet classes and the ballerina sculptures in particular, as ‘logical’ constructs of movement, inform more than a precarious or disconcerting temporal balance of the present moment. In common with his contemporaries, Degas faithfully marked his work with a pictorial temporality. Outdoor compositions of Degas’ era, such as bridges by Renoir painted at different hours of the same day (Argan 1995), show not only the quick gestures and combinations of colors that depict the ‘here and now’ but also the irresistible change of light with the passing of time. In this way of representing the world lay the time beyond the present moment.
In Degas’ sculptures of dancers, the classical ballet, which can vary in choreographic construction from school to school, worked so brilliantly because it proposes steps of dance that may or may not move the bodies in space. The steps may also be demarcated in limited spaces, where the body can move ahead or only extend itself, with the main support of one or both legs. The poses or large positions of ballet are a result of the positions of the arms and legs of a specific ballet step; that is, they occur as a time or a step traversed by the dancer (Achcar 1986; Bambira 1993). Implicitly, the time depends on the tempo of musical phrases like allegro (fast) or adagio (slow), along with steps and positions of the body. This means that, for example, a large arabesque sculpted by Degas may be emerging from a position or simply indicates the end of the choreography, as an arabesque in penché stage: one single step may represent the past and the future, but contains a lapse of time incorporated in it.

In the sculpture collection of dancers, it is likely that Degas revealed the implicit time of large positions of ballet that can be observed. In the sculptures there are records of time intervals and probable mental representations of the dancer’s movement unfolding, since they can evoke memories of movements or show the body effort in the carved objects. They can evoke in both dance-trained and untrained people states of subjective perception of movement through the expectation itself of the movement represented. The body positions induce memories inherent to the perception process of movement because they give the observer clues to real movements: the tensions, the postures, and the joints exposed in the dancers suggest temporal appeal, marking movements that cannot be sustained forever. It is likely that such movements will eventually happen internally, filling an internal processing time, which may suggest longer or shorter times to the observer that experiences the “here and now.” For example, an arabesque in 3rd position may indicate a movement faster than the 1st arabesque position (sculptures 15 and 13 respectively; see Figure 1).

What would lead an observer to judge more or less movement? Would it be the last memory of movement of the body and its spatial and temporal questions, the volume of the parts within their own space, or the implicit temporal mark in any movement of the three-dimensional organic world? It is likely that these questions can only be answered in terms of cognition and memory, and even more, in terms of representations of internal states and in terms of

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10 The São Paulo Art Museum (MASP) has one of the largest sculpture collections of Degas, containing sculptures of dancers, but also of women bathing, and horses created in wax and covered in bronze (Marques 1999).
subjective components which permeate every encounter between works of art and viewers.

The work of Degas suggests that he knew how to use balance not only to sustain the physical work that he realized but also as a builder of movement over and in time in his aesthetic intensity. His different sculptures of dancers create in the observer a sudden look, perhaps of momentary temporal suspension, that afterwards suggests a temporal stoppage of different lengths. If the differential intensity of movement represented by Degas is evident in his paintings and sculptures, it is possible to say that an observer can find what may be an intentional underlying temporal complexity in all his work that illuminates a quantification of the time carved and physically represented by this impressionist artist.

Put as a question: would it be an implicit interest in the work of Edgar Degas to generate in observers what perhaps he had temporally experienced when seeing the dancers’ movements of his time; would studying his work be actual confirmation that for Degas time becomes manifested in matter?

Paintings and sculptures of Edgar Degas can be understood on the basis of a careful study of human bodies in movements that appear in different ways. In his paintings the movements are emphasized by the composition of scenes which may feature explicit snapshot movements or movements with different degrees of time unfolding. In his sculptures the same thing can happen. However, the carved and bare bodies in extreme positions, in a physical balance that is difficult to maintain for long, create an atmosphere strong enough to influence people’s time perception, intrinsic in the internalization of the flux inherent in motion.

Different body positions in images (paintings and photographs) generate physical responses precisely localized in the parts of body that are being observed (Freedberg and Gallese 2007). According to Freedberg and Gallese, the discovery of mirror neurons (a specific group of cortical cells) might clarify the inexplicable sensation felt when viewing art that represents actions or movements of the human body. The brain can reconstruct the actions viewed by mechanisms of embodiment and empathy, because the motor centers produce what the authors refer to as a mental diagram of the action viewed.

Degas’ work has been widely discussed in terms of the body movements represented in his paintings and sculptures (Argan 1995; Growe 2001; Marques 1999; Strickland 2004). Because movement exists at the intersection between time and space, and his works are about movement, a careful evaluation of their strong temporal suggestions can enhance an understanding of the pieces. Further, it is likely that the observer processes the movements of the
sculptures in distinct manners, inevitably leading to changes in the subjective perception of time in light of this important visual element.

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