Las Meninas in VR: Storytelling and the Illusion in Art

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Abstract

Las Meninas is a virtual reality (VR) artwork based on the painting of the same name by Spanish painter Diego Velazquez. Created for the CAVE(tm), Las Meninas attempts to establish a language of art in virtual reality by placing VR in the realm of storytelling; storytelling that is not simply formalistic and decorative, but also psychological. The viewer confronts a narrative cryptogram which can be deciphered at multiple levels of meaning as he seeks to explore the enigmas inherent in the painting by literally entering into it, both physically and psychologically. This allows for the suspension of disbelief or the illusion in art, the quintessential rule of art.

Keywords

ontological authenticity, kinesthetic / synesthetic stimulation, immersion.

1   Introduction

Many people who have experienced virtual reality (VR) for the first time will attest that they were amazed by the unique perceptual experience, but that their emotional and thoughtful involvement was minimal. This is not surprising since many virtual reality works are, in large part, exercises in visual effects, and not intended as part of a meaningful narrative where form and function are interconnected. To achieve such a narrative, a *language of art* in VR needs to be established. The depiction of *Las Meninas* in VR attempts to establish such a *language* by placing VR in the realm of storytelling that is not simply formalistic and decorative, but also psychological.

The quintessential rule of art is its ability to suspend disbelief and create the *illusion of art.* Through convincing representation, the illusion in art manifests itself, forcing the viewer to become psychologically involved. *Las Meninas* involves the viewer in a psychological narrative imagined as a complex web of signs. The viewer confronts a narrative thread which can be deciphered at multiple levels of meaning. Each deciphered thread embodies a network of signs leading to other signs. If the viewer fails in his initial task he confronts another set of signs to choose from which will lead to other sets. The viewer's psychological inquiry into the narrative and her attempt to decipher its cryptograms

places emphasis on her *reactions* to the virtual world and not the virtual world itself.
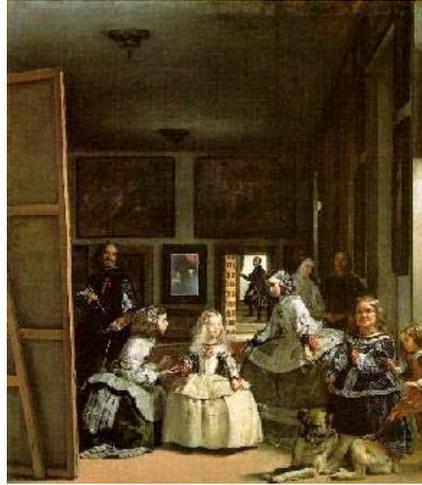

Fig. 1. Las Meninas as painted by the Spanish painter Diego Velazquez in 1656.

For the work to function at the psychological level and achieve the illusion in art, the viewer must *believe* in the nature of representation the virtual world portrays. The primary concern of *Las Meninas* in VR is focused upon the mechanism of certain effects and not their causes. That is to say, the viewer explores relationships rather than individual elements. However, for this investigation to occur, two elements are necessary: ontological authenticity and kinesthetic/synesthetic (k/s) impact. Once these elements are fulfilled, the *illusion in art* in VR becomes possible.

2   Storytelling specificity in VR

Las Meninas, or *The Maids of Honor*(1656) by the great Spanish painter, Diego Velazquez, as shown in figure 1, challenges the viewer with its allegorical subject matter and enigmatic mise-en-scene [4, 7]. From the outset the viewer confronts the artist's canvas which is forever hidden from view. The viewer desires to see what is hidden and at the same time witnesses a mise-en-scene which carries within itself multiple allegorical meanings: the pictures decorating the walls of the room in Velazquez's composition - subjects from Ovid's *Metamorphoses* painted by Mazo after the originals by Rubens [1]; specifically, the two pictures hanging high on the rear wall, over the mirror, *Pallas and Arachne* and *Apollo and Pan*; the mirror in the black frame at the back of the room which reflects the half-length figures of King Philip IV and Queen Mariana under a red curtain

but nothing else; the mysterious light shining in from the upper right side of the room; the magical stillness of the room and the people in it, as if photographed, forcing the viewer to believe himself to be actively present at the scene; the painter himself whose "dark form and lit-up face represent the visible and the invisible" [3]; the lame devil, Jose Nieto, standing in the background in an open doorway; the imaginary space lying out of the picture frame where Velazquez, the Infanta, her maid, the girl dwarf, and Jose Neito are looking, each from a different point, at the sovereigns, who are in theory standing next to the viewer; and so forth.

The allegorical subject matter and enigmatic mise-en-scene work together in Velazquez's painting to *dramatize* the *inner focal point* of the realm of the painting and the *outer focal point* of the realm of reality - the viewer's position. The viewer is at once *seeing* and *being seen*. He constantly oscillates between *objective realism* and *subjective* paradoxes arising from the emblematic interpretations which the overall mise-en-scene lends itself to. Vision is no longer fixed on a single vanishing point, but is now *dispersed* over multiple planes of form, function, and subjective meaning. The painting raises questions about the nature of representation and subjectivity in a unique way rarely matched in the history of visual art.

In the CAVE [2], the painting of *Las Meninas* becomes the virtual reality of *Las Meninas*. The viewer is able not only to explore certain problems pertaining to the nature of representation and subjectivity, but also face further enigmas. The ten foot tall painting, which matches the size of one of the CAVE's large projection screens, becomes an immersive environment where several people can experience the work simultaneously, as shown in figure 2. The theoretical questions the painting raises become tangible and empirical once placed within the boundaries of VR. In other words, the painting's fixed and traditional nature of representation and subjectivity take on a dynamic and physical aspect once the center of vision is *dispersed* in the medium of VR.

Fig. 2. Two photographs of viewers within *Las Meninas* in the CAVE.

Las Meninas in VR approaches the question of representation and subjectivity from various angles. Ontological authenticity and k/s stimulation establish a frame of reference from which these questions ensue. The frame of reference consists of four characteristics. First, the fusion of optical and virtual images. Second, the creation of multiple guides - both visual and aural. Third, the creation of a *total environment* and the *double articulation of time*. Fourth, the dramatic shift from the formalistic to the psychological.

Before discussing the frame of reference and how it draws the viewer into the narrative act in a virtual environment, a brief description of the experience is necessary.

3   The Virtual Experience

Las Meninas is primarily designed to run in the CAVE(tm), a multi-person, room-sized virtual reality system developed at the Electronic Visualization Laboratory (EVL) of the University of Illinois at Chicago. The CAVE is a ten by ten by ten foot room constructed of three translucent walls. A rack Onyx with two Infinite Reality Engines drives the high resolution stereoscopic images which are rear-projected onto the walls and front-projected onto the floor. Light-weight LCD stereo glasses are worn to mediate the stereoscopic imagery. Attached to the glasses is a location sensor. As the viewer walks within the confines of the CAVE, the correct perspective and stereo projection of the environment are updated. This presents the user with the illusion of walking around or through virtual objects. Four speakers mounted at the top corners of the CAVE provide audio. The user interacts with the environment using the *3D wand*, a simple tracked input device containing a joystick and three buttons. The wand enables navigation around the virtual world and the manipulation of virtual objects within that world.

As *Las Meninas* begins, the viewers find themselves situated in relation to the work in much the same relationship as they have with the painting. They are unable to move around the work and can not investigate what is on the canvas. An optically-generated actor, or avatar, playing the role of Velazquez enters the studio through the doorway as shown on the left in figure 3. The actor pauses in front of the hidden canvas becoming the two dimensional painted image of Velazquez. Pre-recorded narration sets the scene and contextualizes the narrative, while a prelude from *The Well-Tempered Clavier* by Johann Sebastian Bach plays in the background. The narrator asks the viewer to *paint* in the rest of the characters as positioned in the original painting as shown on the right in figure 3. This allows the viewer his first attempt at interactivity as the wand becomes a brush used to paint the characters. The narrator then describes the painting, telling the viewer who the various characters are, and points out the various enigmas as shown on the left in figure 4.

The two dimensional painted characters existing in a three dimensional world now become themselves life size three dimensional characters as shown on the right in figure 4. The Infanta Margarita moves out from her place towards the

Fig. 3. On the left, as the experience begins, an actor portraying Velazquez enters the virtual studio and takes his place in front of his canvas. On the right, the viewer complete Velazquez's composition by "painting" in the rest of the life-size characters using the CAVE's wand.

Fig. 4. On the left, the narrator discusses several enigmas in the painting. For example, the mirror at the back of the room is brought forward so the viewer can get a better look at what it is reflecting. On the right, the 2D characters in the painting become life-size 3D characters in VR. The viewer can now walk around the studio and see the scene from any point in the room.

viewer and then brings him into the scene, allowing him to see the scene as Velazquez would have seen it. This is the viewer's initial entrance into the world, previously unattainable. The pre-recorded narration informs the viewer that he is now free to explore this world. Moving about the studio the viewer can observe the scene from any point in the room, or from any character's point of view. Looking out the windows of the studio, the viewer sees two non-Euclidean spaces of revolving panels. The first shows figures who influenced Velazquez's time (Bacon, Descartes, Galileo, Cervantes, and others). The second shows the representation of marriage in painting, such as Jan Van Eych's *Arnolofini Marriage*, which shaped the way Velazquez thought of the use of mirrors and reflec-

tions to represent the visible world [6].

Leaving the studio via the doorway Jose Nieto stands in, the viewer enters a corridor with paintings by Mazo, Velazquez's apprentice, after Rubens, hanging on the walls. This corridor leads to a tower. Echoing an earlier narration that Velazquez had access to a tower from which he has observed the heavens, the viewer climbs up the steps of this tower accompanied by music from Bach's *St. Matthew Passion*. He enters a room with telescopes, a three dimensional triptych, and a large painting of Christ by Velazquez himself as shown on the left in figure 5. Leaving this room they enter a passageway with paintings by Picasso and the Russian painter Medvedev after *Las Meninas* [5]. As the viewer moves from the 17th. to the 20th. century through this transitional corridor, the music shifts from that of Bach's fugues and preludes to that of Ligeti and Schnittke as shown on the right in figure 5.

Fig. 5. On the left, as Velazquez had a tower for observing the heavens, the viewer can climb a virtual tower of their own to reach this observational room. On the right, the viewer walks from the 17th. to the 20th. century down a hallway lined up with paintings by Picasso and the Russian painter Medvedev after *Las Meninas*.

The narrative description of the painting includes a quote from Picasso that *Las Meninas* suggested to him the entrance of fascist soldiers into the studio of Velazquez with a warrant for his arrest. Picasso's interest in *Las Meninas* has to do with its central theme of the painter and his relationship to his models, and also with its profound meditation upon the historical and societal precondition of artistic activity and power relations. The new space the viewer finds himself in has several elements playing on this theme of power and domination as shown in figure 6. Television sets hanging in mid-air juxtapose archival film footage from 1936 of General Franco, of Hitler in *Triumph des Willens*, and of Chaplin in *The Great Dictator*. Large two dimensional images of Franco and posters from the Spanish Civil War adorn the walls in front of murals of Picasso's *Guernica*

[8]. Turning around he finds he has walked into this scene from out of one of Picasso's study paintings after *Las Meninas*.

Finally, the viewer returns to the studio, seeing the scene from the perspective of Jose Nieto at the back of the room. Several possible paintings are shown on the blank canvas as in figure 7. The return to the initial space is marked with renewed questions enhanced by the multi-layered perspectives the journey has revealed to the viewer. Life at the court of Velazquez was strictly hierarchical. The composition itself preserves this hierarchy and marginalization of the painter. Was Velazquez trying to *correct* this hierarchy through allegorical and symbolic allusions about the nature of representation and subjectivity? What was it that he was painting on the hidden canvas? Was Velazquez painting the King and the Queen, the *Las Meninas* itself, or figures of everyday life and, thus, was rebelling against the King and the Queen and the entire tradition of court painting? These relationships are all scrutinized in the medium of VR .

4 The *illusion in art* in VR

From the outset, the viewer's conscious and unconscious mind is at work making inferences and reading the narrative cryptograms in *Las Meninas*. This reading is possible because the viewer *believes* in what he sees and can identify with it. It is here, in what is called *ontological authenticity*, that the first rule of the illusion in art, or the ability to suspend disbelief, manifests itself. For the illusion in art to become a sufficient condition in VR, k/s stimulation of the sensory-motor scheme is required. Both elements fulfill the requirements for achieving the illusion in art as well as formalistically enhancing the meaning of the thematic narrative plot.

Ontological authenticity refers to the illusionistic ability of the three dimensional images to show an *authentic* representation of reality. Even if these images are unfamiliar to the human eye, they have to be extrapolated from the known in order to achieve a convincing representation. The kinesthetic impact in VR is a result of the viewer's continuous navigation and the movement of image itself. The synesthetic impact is a result of the seamless interaction between the auditory and the visual elements.

Las Meninas manifests ontological authenticity and k/s stimulation in many ways. The viewer is not only immersed in the three dimensional images, but he also *believes* in the *real* images of an avatar, a studio, a tower, passageways, and various historical and political rooms. Furthermore, the mise-en-scene, location sound, and the use of the music of Bach, Ligeti, and Schnittke, are orchestrated in order to achieve *genuine realism* and enhance the emotional participation of the viewer in the act of revelation.

The orchestration of visual and auditory elements are often abstracted and made unfamiliar in order to intensify and stimulate the viewer's mental participation. The abstraction in *Las Meninas* is always extended or extrapolated from the *known*. Therefore, the viewer is often immersed in the three dimensional images and sounds which are *estranged*, i.e., on the one hand they appear

Fig. 6. Picasso saw issues of power and domination in *Las Meninas* and here the viewer can experience a 20th. century interpretation.

and sound *concrete* and *real*, but at the same time the viewer knows they are synthetic and aesthetically constructed. The viewer has no illusion that she is confronted with a *real* image, yet she believes in it because it is extrapolated from the known.

Fig. 7. Returning back to the studio where he began, the viewer sees what could be on the canvas. From this new perspective, looking back, several possibilities can be seen.

Ontological authenticity is therefore a layer upon which k/s stimulation is built to achieve the illusion in art. In *Las Meninas*, everything about the journey is at first sight *concrete*, in order to draw the viewer into the narrative through the use of optically generated images. As the story proceeds, however, the integration/interaction of long navigation, blurred and hallucinatory landscapes, non-Euclidean spaces, accelerated and decelerated motion, sudden shifts from color to black and white, the mix of 17th century tonal music and 20th century atonal music, bizarre and distorted decor, a labyrinthine structure and parabolic style, temporal pressure and spatial discontinuities, and the use of archival film footage in virtual environment, create a cognitive impact in the viewer. This

impact *dramatizes* the journey and fuses the overall narrative with oneiric feel and engages the viewer in the action plot.

The viewer constantly alternates between the space of the representational and that of the surreal, with the latter grounded in the representational. It is in this space that the suspension of disbelief and the illusion in art occurs. It is here that aesthetics and psychology become intertwined.

In the following sections we will elaborate on how ontological authenticity and k/s stimulation in *Las Meninas* establish a *language of art* in VR.

4.1   Fusion of optical and virtual images

Las Meninas starts when the rear door of Velazquez's studio, a three dimensional computer-generated image, opens to let an optically reproduced avatar playing the role of the painter himself, enter the empty space which is computer-generated. From the start the viewer experiences a *narrative tension* arising from an immediate oscillation between the world of the *real*, optics, and that of the *imaginary*, virtual environment, which is nontheless ontologically authentic. Therefore, ontological authenticity is doubly represented through optics as well as through a virtual world made authentic. This narrative tension is characterized by the viewer's ability to *see* something as both real and imaginary simultaneously. He believes that what he sees belongs to the laws of optics, but at the same time existing within the laws of virtual environment.

The fine line between the representational and the virtual forces the viewer to reflect upon the imaginary space empirically. The viewer cannot say to himself that nothing is believable in this narrative because it is virtual and non-real. The optical images fill the gap empirically as well as the ontonologically authentic virtual environment. This makes the viewer, at least initially, *identify* with the narrative unfolding. Of course, this practice is not new in the history of art. Both the Dadaists and the Surrealists employed such techniques quite successfully in painting and cinema where the real was made *estranged.*

Another instant in *Las Meninas* where the fusion of the optical and the virtual take place is towards the end of the narrative. After the viewer leaves the world of the 17th century, Velazquez and the fugues of J. S. Bach, he enters the world of the 20th century to witness studies by Picasso of *Las Meninas*, his *Guernica*, the serial music of Ligeti and Schnittke, but above all the viewer encounters television sets suspended in mid-air. The sets show archival film footage of Hitler and Franco, and of Chaplin. Here again, the inclusion of optically-generated images with ontologically authentic virtual environment functions at a meta-thematic level to provoke reflections on the changing methods of representation and subjectivity. The viewer is constantly shifting from the representational to the virtual and back. It is in this oscillation that the foremost element of storytelling manifests itself: the suspension of disbelief or the illusion in art.

4.2   Visual and aural guides

Las Meninas incorporates multiple visual and aural guides. The first guide is

the disembodied voice of the narrator who narrates the historical, political, and aesthetic cryptograms present in the painting. Later, the Infanta Margarita acts as a three dimensional guide, leading the viewer from her static perspective, into the painting, and allowing her to move about the space freely. At first, the infanta seems to be an alias of the invisible narrator, but when the viewer is given freedom of movement, the narrator suspends his narration, and the Infanta resumes her place in the scene. Another guide steps into the narrative. This guide is a person standing with the viewing audience in the CAVE who then takes on the responsiblity to guide the them through the rest of the narrative.

This method of using a guide familiar with the story is inspired from Japanese Kabuki theater, a highly stylized and somewhat overwrought dramatic form derived from the feudal Tokugawa period (1603-1867). In Kabuki theater, there is a benshi, or actor, who stands at the side of the stage and narrates the action for the audience (a method later used in early Japanese silent cinema).

In *Las Meninas,* the benshi, or guide, fulfills a double function. He navigates the viewer throughout the rest of the narrative, and narrates and sometimes reflects upon the various cryptograms. The viewer can interrupt the benshi and raise further questions, doubts, comments, and objections. This helps create a dialogue between the benshi and the viewer, and also among the other viewers as well, a property possible because of the social nature of VR in the CAVE.

Therefore, the continuous navigation and seamless interaction/integration between the visual and auditory elements create in the viewer a k/s stimulation which draws him, both psychologically and physiologically, into the action plot.

4.3   A *total environment* and the double articulation of time

After the optical Velazquez takes his place in the empty virtual studio the viewer *paints* the rest of the painting, the Infanta Margarita and her entourage, using the wand in the CAVE like a paint brush. It is with such interactivity that the viewer is able to create a balance between what is presented in front of him, the phenomenon, and his own manipulation of it in VR. This double articulation of time, that is, time that already exists in the phenomenon and its manipulation by the viewer, gives the viewer the feeling that the reality presented in the CAVE is not only representational but also ontological and subjective. The viewer is finally able to be part of the phenomenon. He is an extension of a virtual world in which he can shape and determine the outcome of events. The phenomenon passing in time can now be interrupted, accelerated, decelerated, moved both backwards and forwards, and completed or left as is. The virtual environment becomes a *total environment* in which the viewer is both an extension and a determining factor of the environment.

The viewer's participation is not arbitrary in *Las Meninas.* If he chooses certain signs about the narrative, further historical, political, and aesthetic signs are revealed to him which propels the narrative in a certain direction. The viewer involved interactivity is intrinsic to the narrative's overall structure, and necessary for the unfolding of the enigmas of representation.

4.4 Dramatic shift from the formalistic to the psychological

Las Meninas is staged in such a way that there is a dramatic shift from the formalistic to the psychological. Not only does the work invent passageways, towers, three dimensional triptychs, non-Euclidean spaces, telescopes, transparent surfaces, and television sets, which are ontologically authentic, but it also provides them with a history in order to connect them with the narrative and give them meaning. The viewer has the choice to navigate and interact with various historical periods, from the 17th to the 20th century, which embody specific sets and music reflecting their historical, political, and aesthetic specificities. The shift from one period to another is an attempt to make connections between various periods and demonstrate how form and function act as one. The psychological factor here plays a major role. Not only does the viewer experience a specific *sensation* arising from the specific formalistic set and music, but also her mental act of perception becomes based purely on unconscious inferences she makes as she navigates and interacts with various sets in different periods.

5 Conclusions

Illusion in art is a complex topic and each era has its own limitations and paradigms when rendering reality. When we look at Egyptian art, for example, we read it as a brilliant signaling system of code, and not as a literal representation of reality. But is this the way the Egyptians themselves saw their art? The Greeks created the three-tone code for modeling in light and shade which remains fundamental to all later development of Western art. As inheritors of that tradition and inventors of VR artworks, it is important to invent a *language* which defines the way our new tools of production operate and shape the future of art. In VR, it seems that few works try to systemically formulate an artistic position and find ways to create a language of art whose essential function is the manifestation of the illusion in art.

In VR, a developed system of schemata in which the illusion in art is possible consists of two elements: ontological authenticity and k/s stimulation of the sensory-motor scheme. The viewers' positive response, after *Las Meninas* was shown at the International Society For the Electronic Arts and at ThinkQuest 1997, tells us that they completely forgot about the technology of the CAVE and that they *believed* in the narrative unfolding and were psychological involved in its transformations.

At first, the viewers experienced the thrill of a perfect illusion in the CAVE because the bridge between the phenomenon and the virtual is broken. However, once this illusion wears off, it is essential that something else fills the gap because we want and expect more. The history of technologically-based art is full of such instances. Early cinema, for example, was a thrill because of the darkened theater, flickering images, remote places, and so forth. Later, audiences wanted more and it was through dramatic narrative plots, whether linear or non-linear, that cinematic art developed.

VR is facing a similar challenge to that of its cousin, the cinema. Without ontological authenticity and k/s impact *Las Meninas* would have been an exercise in effects, and not a work where illusion manifests itself as we react, feel, and think in front of the crytograms of its virtual world. In other words, in *Las Meninas* the viewer not only witnesses the faithful and convincing representation of a visual experience through ontological authenticity, but also the faithful construction and orchestration of a relational model in which the interplay of image and sound trigger in the viewer a k/s stimulation to bring about a *second reality.* This second reality originates in the viewer's conscious and unconscious *reaction* to the virtual world and not in the virtual world itself. The *ilusion in art* finally manifests itself in the viewer's *reaction* to the virtual world they experience.

Acknowledgements

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