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THE PARADOX OF VIRTUAL EMBODIMENT: THE BODY SCHEMA IN VIRTUAL REALITY AESTHETIC EXPERIENCE

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ABSTRACT. New technologies implied in art creation and exhibition are modifying the traditional landmarks on which aesthetics has always focused. In particular, Virtual Reality artworks call the body into question when it comes to living a bodily experience within exhibitions accessible through technological tools that expand the human body's capabilities and motor potential. The body's status is challenged in its traditional unity, that of a subject of experience living in a world where the spatial configuration is relatively constant. Conversely, in Virtual Reality, the spatial aspect is novel to our body which needs to adapt to unpredicted and disorientating motor schemas. Therefore, the Virtual Reality aesthetic experience takes place into a novel configuration for the human body: hybrid and split into the virtual realm.

Keywords: Aesthetics; Virtual Reality; Embodiment; Digital art; Bodily awareness

Introduction

The current landscape of art is increasingly often involving technology. On the one hand, as regards the *creation* of the artwork, the artist's role is often delegated to technology tools that physically give form to the work of art. 3D printers now *print* an object that is perfect considering the parameters inserted in the device at the beginning of the process. Here, the artist's creative process is separated from the execution and the process of creation leaves no chance to errors that may occur when a human hand is painting, sculpting, or playing. On the other hand, as regards the *fruition*, the work of art's status, form or place, is no more instantly recognizable. Indeed, new technologies make it possible to exhibit a potentially infinite number of images through the screens. It also happens that the exhibition hall is literally covered by screens that coat even the floor and the ceiling, allowing a complete immersion for the viewer in the work of art, displayed through images in a very high definition. The use of technology in art could also be configured in a more pervasive way with the employment of Augmented Reality (AR) or Virtual Reality (VR).

In this context, the aesthetic object is radically changing its conformation and, specifically, how we come into contact with it. While before we were in front of something that could be a painting or a photograph or a sculpture, now our body is really part

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of the artwork. At the same time, our body alone is not enough to fully perceive the virtual artwork because we need tools like VR headsets or haptic suits to enter the virtual world the artist has created. The focus is therefore our body, called into action and extended at once. As never before, it becomes the living matter of the artwork, not only simulating its participation as it happens in front of a movie or a theatre performance but fielding its perceptive properties into the aesthetic experience.

The role of the body towards the artwork

Science itself, moving away from the idea of the body as a mere medium through which stimuli can reach the brain, found that the mechanism of empathy and, in general, of emotion recognition, takes place at a bodily level. The mirror mechanism explains how the mere observation of other's actions or emotions activates brain networks that transform the visual – or auditory– information into motor and visceromotor representations of the action or emotion[1]. This sensorimotor transformation also encompasses the affective quality of this action or emotion. The style of the action and the affective quality of the emotion are perceived literally through our body, reproducing them through its sensorimotor system[2].

Therefore, it is clear that the primary role in the intersubjective interaction is assigned to the body and the motor system. They allow us to perceive the world and to come into contact with another subjectivity. Now, the contact that we regularly have with the world happens through a multimodal integration whose condition of possibility is the presence of our whole body and its specific sensibilities. Our body represents the ground zero of any knowledge of the world. Merleau-Ponty gives an exemplary explanation of this. His concept of *body schema* reveals that the body is the intertwining of all the objects of the world that acquire relevance, meaning because it is the body itself that is the common «texture»[3] of all things. For this reason, it is a necessary instrument of all understanding. The body, explains Merleau-Ponty, is the condition of possibility of attributions of meaning not only to *things* but also to *cultural objects* as speech that «Avant d'être l'indice d'un concept il est d'abord un évènement qui saisit mon corps»[4].

From the perspective of neuroscience, the importance of the body in perception is investigated by Gallese and Guerra[5] which explain the *embodied simulation* mechanism.

[1] G. Rizzolatti, C. Sinigaglia, "The mirror mechanism: a basic principle of brain function" in *Nature Reviews Neuroscience*, 17(12), 2016.

[2] G. Di Cesare, C. Di Dio, M. J Rochat, C. Sinigaglia, N. Bruschweiler-Stern, D. N. Stern, G. Rizzolatti, "The neural correlates of 'vitality form'recognition: an fMRI study: This work is dedicated to Daniel Stern, whose immeasurable contribution to science has inspired our research" in *Social cognitive and affective neuroscience*, 9(7), 2014, pp. 951-960.

[3] M. Merleau-Ponty, *Phénoménologie de la perception*, Gallimard, Paris 1945 and M. Merleau-Ponty, *Le Visible et l'Invisible*, Gallimard, Paris 1964.

[4] M. Merleau-Ponty, *Phénoménologie de la perception*, Gallimard, Paris 1945, p. 272.

[5] Gallese V., Guerra M., *Lo schermo empatico. Cinema e neuroscienze*, Cortina, Milano 2015

Here, the mere observation of manipulable objects determines a motor activation in the observer's brain even in the absence of any intention to perform movements towards the object. Our representation of the objects in the world happens in relational terms[6]. They hypothesize that embodied simulation is at the basis, together with cognitive abstraction, of our ability to create and participate in imaginary worlds of movies and artworks. This means that the sensorimotor system structures not only the execution of an action but also its *imagination*[7].

In light of these considerations, the relationship between the viewer and the artwork looks remarkably similar to the one between human beings. Many authors have shown that the encounter between the spectator and the artwork really happens on an intersubjective level: Mikel Dufrenne devoted extensive reflections to this issue that led to one of the key concepts in his entire work: the aesthetic object is defined as a «quasi-sujet»[8]. The encounter is intersubjective because the aesthetic object is seen as another subjectivity, an *other* to interact with.

Virtual reality, virtual art, virtual body

What happens instead when the use of the most recent technological techniques and tools determines a radical change of traditional landmarks on which aesthetic reflection has always put its focus? Digital artworks and even more VR artworks are designed to actively involve the viewer and to let him be part of the staging of the artwork. The newest works of art aim to make the world they present really close to us: these artworks are built to give us the sensation of inhabiting a world that is other from us, as if it were ours (see fig. 1 and 2). Touchscreens, haptic suits, Oculus Rifts or VR Headsets are an attempt to physically connect the real world where our body is located and the imaginary worlds of artistic creations[9].

[6] Ibi.

[7] Ibi.

[8] M. Dufrenne, *Phénoménologie de l'expérience esthétique*, tome I, P.U.F., Paris 1953 and M. Dufrenne *La notion d'a priori*, P.U.F., Paris 1959 and K. Chagnon *L'œuvre d'art comme «quasi-sujet»?* in *Mikel Dufrenne et l'esthétique. Entre Phénoménologie et philosophie de la nature*, curated by J.B. Dussert e A. Jdey, Presses Universitaires de Rennes, Rennes 2016.

[9] V. Kuchelmeister, "The virtual (reality) museum of immersive experiences", in *Proceedings of the Conference on Electronic Visualization and the Arts*, 2018.

Fig. 1 "*Carne y arena*", Alejandro G. Iñárritu. This documentary was presented in the 2017 Festival of Cannes by the director Alejandro Iñárritu. The subject is inside the documentary scenes, he is in the desert where a group of soldiers is beating some Mexican migrants that are seeking to cross the American border. The exhibition hall is covered by warm sand on the floor and a warm wind blows in the room to enhance the sensation of being in the desert.

Fig. 2 "*The Chalkroom*", Laurie Anderson. In this Virtual Reality environments awarded "Best VR Experience" at the 74th Venice International Film Festival, the experiencer can levitate and float through a vast eight-room architectural environment.

Here, in exploring a virtual scenario, the spectator, or now, the participant, experiences the sensation of being in another place compared to the place in which their physical body is.

To deepen the changing of the relationship between the viewer and the artwork, it is helpful to recall the work of Mikel Dufrenne. He reflects on the modalities through which the aesthetic object expresses its meaning. The *world* of the artwork, that is its peculiar atmosphere, does not acquire a sense in the distinction between real or unreal. The truth of the artwork, its significance, and its sense is shown and refers directly to the *form* in which the spectator is presented with it, in the *sensible*. All that is expressed coincides with the way it is expressed, the *sensible form* of its expression.

The more digital art expands its boundaries, the more *participation* in the artwork happens through a real interaction-action that implies the use of specific technological tools to experience the *sensible*. The aesthetic object's form and significance appear only if the spectator, now the experiencer, collaborates with technological devices. Here, the dimension of the *embodiment* is shared. Indeed, bodily participation in the artwork happens by adapting our body to work synergistically with technical tools that enhance the motor action potential of the body itself. Therefore, the idea is that in virtual realities, the mapping of the space around us, that is motor space, by the neurons, should encompass a new configuration that is the product of the incorporation of technological tools in the perceptual act.

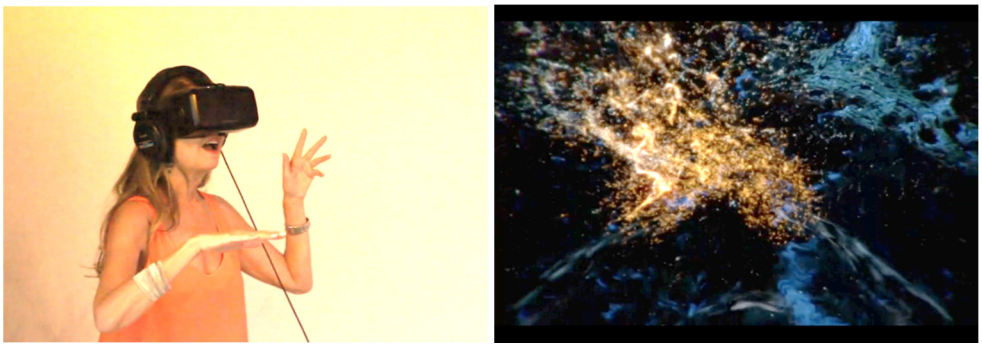

Fig. 3. "*Sentient Flux*" Nicola Plant

Nicola Plant, an artist who has created some relevant VR exhibitions, develops projects whose aim is to highlight the embodiment of intersubjective dynamics. In the "*Sentient Flux*" exhibition (see fig. 3), the experiencer becomes herself actor because of her actions and interaction with Virtual Reality. The experiencer wears an Oculus Rift, and her movements are mapped by a Kinect system. In the virtual environments in which she finds herself placed, the movements she performs leave a trace drawing a trail of luminous particles in the space. With the sense of sight, the experiencer can therefore see her virtual hands touching this trail of light, while, in fact, her sense of touch of her real body does not receive any stimulus.

My hypothesis is therefore the following. Firstly, the motor action potential of the body appears to undergo a sort of *split*. It takes to consider a concrete case –similarly to Nicola Plant "*Sentient Flux*"– in which a subject is simultaneously wearing a haptic suit and a VR headset. If she had the chance to grasp an object in the virtual environment using a virtual double of her arms, due to her sense of sight, she could see the object and her virtual arms heading towards it to grab it. Although she can *see* the grasping of the object with her virtual arm, this gesture does not correspond to any tactile stimulus on the real body. Merleau-Ponty's reflections on the sentient and sensed body[10] could help consider another perspective. Our body often has a virtual double in VR, but this double is only a body that we can objectify and, therefore, only a sensed body. The virtual body we can see in VR could be considered an incomplete *body* because it has no chance to *perceive* anything. Thus, it cannot be a *sentient* body. On the basis of the previous considerations about the role of the body as a unified presence that is involved in the mapping of the surrounding environment, it is easy to see that in a virtual place, this unity of the body as the ground zero of any perception, is modified.

[10] M. Merleau-Ponty, *Phénoménologie de la perception*, Gallimard, Paris 1945 and M. Merleau-Ponty, *L'OEil et l'esprit*, Gallimard, Paris 1964.

Secondly, it is come to create a sort of *hybridization* between the world of the viewer-experiencer and the world of the work of art. The boundary between the reality in which our body is located and Virtual Reality is now really blurred[11]. Christian Lemmertz, an important artist active in the field of VR artworks, revealed during an interview that it is as if, for the first time ever, the spectators were able to *see*, with their own eyes, what is inside his mind, in the artist's mind. The idea is to gain access, as never before, to the first-person experience of another human being, someone different from ourselves, obviously considering the current limits of technology. The possibility is to share what the other has in her mind, no longer only describing or imagining it, but living a bodily experience of this, an experience that could become part of our own experience.

The phenomena of split and hybridization emphasize the paradox of an embodied presence within an environment, the *virtual* environment that is, by definition, other than the *real*.

The potential of digital art

The traditional process of composition of a work of art has always been guided by the need to find the perfect shape, to give form to the object of thought even though not necessarily a beautiful shape as the twentieth-century avant-gardes have shown. The artist, the painter, the sculptor, or the director have always dealt with a process in which the objectification of their thought was essential to return the spectator their experience and provide a form of expression to their idea. Equally, the spectator's experience has always been that of a remote recipient for whom the act of receiving implies a duration of time, a later moment in time to elaborate someone else's idea. The reception of art has always included a *re-flection*, that is the reflection of the artist's experience on our subjectivity. In this moment of contact between two subjectivities, that of the artist and that of the spectator, Mikel Dufrenne saw the peculiar function of art. The power of art is to show individuals the possibility of a return to a common origin, a place in which any chance is open because the world has not yet assumed a defined form[12]. The *art*'s tension towards this place where everything begins again and infinite «*possibles»* dwell is the revolutionary potential of any artistic practice[13].

Going back to actual artistic practices, if we think of a VR artwork built for us to live the first-person experience of the artist, it can clearly be noticed the lack of any distance between us and the artist's subjectivity because her idea literally hits us. In this case, we can *share* a unique sensible form that reaches us with no reworking. We are not shown the sensible form of an idea, but we experience it, we can feel this *sensible* as if it were ours. In this way, the origin is always and as soon as we enter it, already formed. The contact with the origin is never formless.

In my opinion, this is anything but a threat to our sensibility: the chance we might have in the future, when technologies

[11] L. Floridi, *The onlife manifesto: Being human in a hyperconnected era*, Springer, New York 2015.

[12] M. Dufrenne, *Art et politique*, UGE, Paris 1974.

[13] M. Dufrenne, *Phénoménologie de l'expérience esthétique*, tome I, P.U.F., Paris 1953 and M. Dufrenne *La notion d'a priori*, P.U.F., Paris 1959.

will have reached a higher level of precision, is to share on an entirely different level our experience with others. To develop such technologies and build such works of art, it is necessary to go deeper in the knowledge of our perception and in the way our frameworks of action work in a different reality, a *virtual* reality.

The spectator's body in virtual museums

The last year when the Covid-19 emergency spread in the whole world has seen the growing use of virtual tours or exhibitions in many museums around the world. Since people were forced to stay at home, sometimes with much more free time than ever, the internet has become the precious system to gain access to galleries, exhibitions and museums. Sometimes, the virtual display of art collections consisted of high definition photos of the artworks made available on the museum or gallery website. But in other cases, the visit to the exhibition was organized as if the movements of the remote spectator could really be those of a person exploring the exhibition's spaces. It was possible to enter a room and zoom into a painting simulating the movement of getting closer to the artwork with the body. It was also possible to decide which path to follow into the exhibitions, which room to enter before or visit again later. Such exhibitions were visible from the first-person perspective because the 360° tour was built to give the illusion of being present also with the body.

The impossibility of being physically present has led to the attempt of re-creating the experience of *being* a body and moving with it inside the exhibition hall. This experience has been built by means of technological tools. Here the shift is double: on the one hand, the camera operator who recorded the exhibition hall with multi-cameras to record 360° videos used her movements in order for her own body schema to be shared and employed by the spectators on the exhibition website. On the other hand, there is the fruition of the 360° video recording by the spectator who, through her device, can simulate the viewing of the exhibition, somehow overlapping the camera operator's body schema and taking possession of it. It is clear that the degree of immersion for the spectators depends upon the specific device used.

Quantitative or qualitative

The theme of *simulation* raises questions about the nature of the traditional aesthetic experience compared to the Virtual Reality one. Thinking about the former, as viewing a painting or a theatrical performance, it has been seen that the motor system of the spectator somehow replicates the movements of the actors or the moving lines in a painting. The correct word for such replication is *simulation* because we are not really performing the movements or walking down the path we see in the painting but only looking at it. On the other hand, the VR aesthetic experience is not only a simulation because our body is involved and is an active part of the work of art. The word virtual itself alludes to the concept of potency in its Latin root. It means something that is not yet real but may become act. Therefore, it may seem that the change from a traditional aesthetic experience and a virtual one is a matter of *intensity* of their connection to reality. But

in point of fact, the nature of this difference is not quantitative. It is rather qualitative because in the case of a traditional work of art, the object of the simulation does not belong to the spectator in person. It refers to the external experience of seeing a painting or a theatrical performance. On the contrary, in the case of a VR artwork, the spectator lives a first-person experience of the world of the artwork.

Multidisciplinary connections: artificial bodily awareness

Since the body plays a leading role in the aesthetic perception and, in general, in our experience of the world, it can be interesting to reason about the most recent advancements done in a field where the human bodily experience of the world is being studied and modelled to reproduce it through another kind of body: the artificial body of robots.

The fields of cognitive and social robotics are moving towards building systems that are human-like not only from the point of view of physical appearance but also in terms of cognition, learning, and behaviour during interactions[14]. Modern robotics is interested in the development of robots with an experience of being a body. «Social robots need a model of the "Self"»[15], which is connected not only with the mere experience of one's own body but also with i) the awareness of being a body in the environment, ii) how to maintain embodied relations with others and iii) the establishment of a coherent in time experience of being a body.

The research in this field is interested in expanding the understanding of the mechanisms underlying the human ability to act in the world and adapt to the environment[16]. Since the discipline of aesthetics in terms of the study of sensible knowledge is nowadays experiencing the presence of additional elements as technological tools involved in the perceptual process, it could be interesting to adopt a multidisciplinary approach to broaden the experimental knowledge of human and artificial bodies involved in perceptual acts. From the point of view of aesthetics, the research may be oriented towards the possibility of expanding the surface of our perceiving body with technological tools so that even the sensations coming from the virtual bodies could become individual bodily experiences. On the other hand, the robotic perspective could explore how information coming from the environment or from the robot's artificial body may become bodily awareness for it. Now that the body has gained technological relevance, the field of aesthetics, by virtue of its being science of sensations and body, turns into a suitable place for a multidisciplinary discussion.

[14] S. Incao, F. Rea, A. Sciutti, "A Self for robots: core elements and ascription by humans", 2021, http://doi.org/10.5281/zenodo.4762300.

[15] M. Lee, *How to Grow a Robot*, Cambridge, Massachussets: MIT Press, 2020.

[16] C. Moulin-Frier et al., "DAC-h3: A Proactive Robot Cognitive Architecture to Acquire and Express Knowledge About the World and the Self", *IEEE Trans. Cogn. Dev. Syst*., 10(4), 2018, pp. 1005–1022.

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