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The Network and Dance, or a cognitive artifact embodied by a situated cognition.

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Keywords: telematics dance, situated cognition, cognitive artifact, body image, body schema

Abstract:

In the light of Situated Cognition, I discuss in this paper the notion of presence in projects where the dancer is not "here-and-now" interacting with her/his partner, i.e. the dancer is not physically there, but s/he is a virtual presence, immersed in a digital environment. Grounded on concepts of "embodiment" (Lakoff & Johnson, 1999) and "actionism" (Noë, 2004), I argue that is a possible variety of presence (Noë, 2012), which creates a specific Body Image and Body Schema (Gallagher, 2005). The digital environments with their interfaces work as Cognitive Artifacts contributing to extend the dancers' (and choreographer's) minds (Clark, 2003). I analyze two projects, one artistic and the other a lab experiment. The artistic project "Embodied in Varios Darmstadt 58" (2013) was a networked performance in which remote dancers from Brazil, Mexico and Spain interacted with each other through video streaming, avatar's image and graphics that represented the concept of sonorous body of each dancer in real time. Lab DCT - Laboratory Dance-Cognition-Technology -, that took place at the "1st interdisciplinary Meeting of Dance-Cognition-Technology", (2016, Brazil) and promoted experiments to explore the notions of presence and memory. Those analyses concluded that if the perceiver (the dancer) knows the world through her/his sensorimotor skills and those are in play when s/he interacts with that given milieu (Noë, 2004), it's possible to assume that such variety of presence brings the dancers different ways of perceiving the partner and of perceiving oneself and so, a new body image and body schema arise being responsible to play an active role in shaping their perceptions (Gallagher 2005). The embodiment process in that environment is consonant with the understanding of the human being as a symbiont coupled to artificial devices created in our culture (Clark 2003).

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Introduction

This text analyzes artistic works in the field of dance with technological mediation, emphasizing two projects on distributed dance: a) the telematics dance performance entitled "Embodied in Varios Darmstadt 58" (EVD58) (2013)[2] realized between Brazil, Spain and Mexico, and b) "Dance-Cognition-Technology Laboratory" (Lab DCT) (2016), experiment realized during the 1st Interdisciplinary Meeting on Dance-Cognition-Technology (EiDCT) [3]. Both artistic configurations analyzed have the relationship of the dancer with a digital being, an image or even a sonorous partner as one of their key aspects. Therefore, we place in the center of discussion the issue of presence in environments of that nature. How is it possible to feel the other's presence when that person only perceives you as an image or a sound? How to interact in dance when the other person is not there in flesh-and-blood, when s/he cannot be touched, sensed, seen, perceived the same way we do when we are in the face of another subject physically present in that very space? From the understanding that presence happens in different degrees and intensities, that it cannot be defined by the subject's physicality, we may assume that there are varieties of presence (Noë, 2012). Presence comprises a sensorimotor knowledge (Ibid.); perceiving the other's presence is a matter of acting to access the world, its individuals and its belongings; therefore, it is about how we are able to reach, understand and interact with the environment. The works examined here are artistic tools questioning our actions in the digital world we live in. It does not mean that is the subject or the theme of the performances, once the organization of those dance systems serves, in its own, to provoke new reflections on the meaning of presence, of distance notion, of the relationship's or interaction's understanding. Art as a "strange tool", according to Alva Noë's (2015) proposal.

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[2] *Embodied in Varios Darmstadt 58* (2013, Brazil, Spain, Mexico) <https://www.youtube.com/watch?v=fDKRkf8c1Zk >. (2014, Brazil, Portugal, Chile) < https://www.youtube.com/watch?v=24q1tBKHzrY >

[3] http://poeticastecnologicas.com.br/site/projetos/#!/lab-dct

Thus, when the artistic proposition is conceived and executed through mediation of bodies geographically distant, as it is the case of the examples analyzed here (or even inside the same room, but with bodies connected through the network), the various levels of presence assumed in this reflection are responsible for providing new ways of perceiving and acting in the world, other possibilities of organization are demanded from dancers and artists involved in the artistic work, as well as from the audience. That process of perceiving and acting in the world, termed as *Actionism[4]* by the philosopher Alva Noë (2012:23), is part of the comprehension of situated cognition, i.e. the subject is implicated with her/his cognitive artifacts and with the environment. For the philosopher, the term emphasizes the importance of sensorimotor understanding for the perceptual consciousness. For that matter, the body image and the body schema are implicated in the embodiment process, they have an active role in shaping our perceptions (Gallagher 2005), and they are responsible for one's behavior and learning.

Proceeding the proposed analyses and reflections, the first section of this article will approach the definition of technological mediation in dance, which is grounded by the concepts of "embodiment" (Lakoff & Johnson, 1999) and "extended cognition" (Clark, 2003) to explain that the given artistic works make projections', audio amplifiers' or other devices' use beyond scenographic one (or merely utilitarian use). There exists a utilitarian use of technology in dance, however the interest here is posed in artistic configurations which propose to explore the devices of the Digital Culture as forms of creative organization. Then, the term mediation is crucial for this given approach.

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[4] *Actionism* is Alva Noë's term for Varela et Al.'s concept of "enaction" (*en acción*).

In the second section, basic concepts of this investigation — embodied and embedded — as well understanding on situated cognition will be defined and applied to the artistic field dealt in this text. Finally, the terms body image, body schema and varieties of presence will be addressed in the analyses of the artistic configurations EVD 58 and Lab DCT.

Dance with technological mediation

Dance, as any other art, has always used the technology available at each era. At the time of Digital Culture, it was not different. Dance artists have found various possibilities of relationship with computing devices. Pointe shoes, the steel cables that suspended the sylphides, and many other machineries have been used throughout the dance history. The beginning of the cinema counted with precious participations of the first movie makers and choreographers of the time. In the field of cinema, another route was taken with works of Maya Deren (1917-1961), in the 1940's, and she was considered a pioneer in works of dance and audiovisual, currently denominated as Dance Film, Screen Dance, Cinedance, among others. There is no interest in addressing the whole history of dance and the use of technologies here. Those are only some of the few examples of the articulation between dance and the devices available at each time.

Technological mediation in dance can be considered inaugural with the creations of North American dancer Loïe Fuller (1862-1928). Fuller noticed that electric lighting, which had recently appeared and been installed in theaters, could enable new corporal organizations and dance configurations. The "serpentine dances" (1892) were created by the association of stage lights and the movements of the body dressed in long fluttering costumes. There, there was no possibility of that configuration to happen without the use of stage light; the implication of lighting and body movements was inseparable. The light device was not used as a utilitarian means to illuminate the

environment, but as a way of establishing another form of aesthetics and dance's own configuration. The work was based on that articulation.

With the arrival of digital technology, computers provided other articulation possibilities. As the stage light continued being used by many only as a lighting design of the environment, as a utility for the scenic setting, the computer can also be used nowadays to enable and collaborate in the scenic construction or even in the lighting and sound. However, the goal here is to reflect on artistic configurations that made the relationship of computer and dance as implicated as Loïe Fuller proposed the close relationship with the electric lighting. Computer is here considered as a general purpose machine which withdraws information from the world to process it in a binary form, with its 0s and 1s digits, and then returning that as data, audio, image, solid forms and any other thing that can be decoded from digital codes. The condition of general purpose machine is an enabling aspect for the relationship between dance and the computational world.

From the several possibilities been explored from the middle of last century up to the present, what interests here is to discuss artistic configurations which use digital information flow as one of the basic aspects of their construction. It is about drawing a dancer's data (her/his image, the coordinates and movements' displacement, her/his sonority, etc.) and sending it to another partner in a distributed system of information that mediates those bodies. That system is denominated telematics, network art or distributed dance. In the works analyzed here, EVD58 counted with the digital information flow of images and sonorities of dancers in Brazil, Spain and Mexico, while Lab DCT experiment was realized in a distributed way, everyone was in the same theater and the stage was divided into many niches.

Questionings raised from the discussion proposed in this article call the attention to aspects of those subjects' relationship, dancers who interact by the synthetic presence (in the sense of digital synthesis) of their partners. The notion of presence is put on the agenda, reviewed and investigated. As Alva Noë argues:

> Art is interested in removing tools (in my extended sense) from their settings and thus in making them strange and, in making them strange, bringing out the ways and textures of the embedding that had been taken for granted. A work of art is a strange tool, an alien implement. We make strange tools to investigate ourselves. (Noë, 2015, 30)

Hence, it matters to emphasize that telematics dance, as well as the other contemporary artistic propositions, posits a way to investigate, question and reflect upon the world we are embedded in, where our situated cognition counts on our extended mind through cognitive artifacts we create and that transform us. As the philosopher Andy Clark argues: "Brain, body, world, and artifact are discovered locked together in the most complex of conspiracies. And mind and action are revealed in an intimate embrace." (1977:33) That topic will be discussed in the following section.

The extended mind, the embodiment and embeddedness process in dance.

This article's reflection is founded in the philosophical approach of the cognitive sciences which assume the position of an "embodied embedded cognition" (EEC). Through such perspective, the brain is not a general controller which commands the body regardless of the world where it inhabits. Opposite from that Cartesian position, this article's approach claims that the brain, body and world are completely implicated and that cognition stems from their inseparable relationship.

> It is the ongoing two-way flow of influence between brain, body and world that matters, and on the basis of which we reconstruct (and constantly re-construct) our sense of self, agency, and presence. The biological skin-bag has no special significance here. It is the flow that counts. (Clark, 2009:4)

We perceive the world with our bodies and not with a controlling brain that receives inputs through the organism's enclosure. We perceive the world with our bodies acting in the environment in an incessant process of accessing and re-accessing that environment, because we do not perceive a fixed and established whole (Noë, 2004), we are in constant "percepAction". The states of the body, also considering the emotional system, are aspects of great importance for the cognitive processes (Damásio, 2011), for they are in continuous embodiment.

> An embodied concept is a neutral structure that is actually part of, or makes use of, the sensorimotor system of our brains. Much of the conceptual inference is, therefore, sensorimotor inference (Lakoff & Johnson 1999, 20).

Add to that, there is the interaction between the body and the world where it inhabits, the unstoppable aspect of embeddedness (situatedness). In other words, the interactions between body and world shape, restrict, direct the possible behaviors of the body which, in its turn, constitutes, even partially, the cognitive process that arises from that relationship.

In the field of study here delimited, from that argumentation, we may believe that a dancer immersed in a digital environment, in a system distributed as a network, perceives that milieu through an uninterrupted process of accessing and re-accessing the system that interconnects the bodies (dancers) through digital processes. The dancer's embodiment process is shaped, constrained by those devices constructing new sensations of interaction for the subject. Hutchins explained that "cognitive artifacts are involved in a process of organizing functional skills into cognitive functional systems" (Hutchins, 2000:8). In that process, the dancer is continuously practicing forms of accessing that reality, creating demands, new perceptions and ways of acting in that situated process, in that embeddedness condition. In short, participating in a creative process in which one must dance with an image, a graphic, a sonority, or other possible decoding, knowing that the information received is really from someone, another subject, another dancer that it is there, makes that condition part of the cognitive system's construction, of her/his behavior and perceptions in that environment.

There, there is a real and honest presence which is apprehended through the sensorimotor knowledge. There is a variety of presence that is perceived all the time, not only in situations created by digital systems, but in the every-day life. As in the examples of Alva Noë (2004), depending on our point of view, we may observe only the tail of the cat behind the curtain, but then,

we may move and find the proof that the feline is really there. We cannot see the other side of a tomato, but we believe that the tomato is whole. Our actions in the world is what reveals to us which is the effective condition of the context. That does not mean that perception is infallible: the tomato may have its bottom spoiled, the tail may be part of a stuffed animal. Anyhow, our action is what brings conditions for the perception to be effective.

Both the presence varieties and the embodiment and embeddedness process are completely implicated with the shaping of our body image and body schema, topic to be addressed in the following and final section of this article.

Body image, body schema of a telematics and distributed dancer.

According to previous argumentation in this article, perception is not assumed as a photograph of a given world, fixed and complete, which is formed inside a controlling brain. In the light of the theories founding the reflection, perception is a relationship between the perceiver and the world, the "perceptual awareness of objects, for actionist-direct realism, is an achievement of the sensorimotor understanding" (Noë, 2012:65). Perception is a matter of availability, and this is a question of understanding and not about mere existence or proximity. Understanding here means the conceptual knowledge, but a practical forms called here sensorimotor knowledge or sensorimotor understanding (Noë, 2012).

The proposal, then, is this: perceptual consciousness is a special style of access to the world. But access is not something bare, brute or found. The ground of access is our possession of knowledge, understanding, and skills. Without understanding, there is no access and so no perception. My emphasis here is on a special kind of understanding that distinctively underwrites our perceptual access to objects and properties, namely, sensorimotor understanding. We can see what there is when it is there, and what makes it the case that it is there is the fact that we comprehend its sensorimotor significance. Sensorimotor understanding brings the world into focus for perceptual consciousness. (Noë, 2012:20)

In EVD58, dancers in Brazil, Spain and Mexico counted with a process of approximately 10 months of work with periodic sessions of distributed rehearsal. Not all of them had previous experience in the field, however the creative process enabled each participant (dancers, musicians, and all the technicians and artists involved) to learn and apprehend ways of accessing that system. That is, throughout the process, everyone started to find forms of interacting with the other, of understanding the other's presence, and of accessing that presence perceived by the image or the sonority. The dancer, then, started to know that environment (the telematics system) through her/his sensorimotor skills because s/he had experienced an embodied and embedded process in that context. Thus, we may conclude that such variety of presence brings dancers different ways of perceiving the partner and of perceiving oneself, and so, a new body image and body schema arise, being responsible to play an active role in shaping their perceptions (Gallagher, 2005).

> A *body image* consists of a system of perceptions, attitudes, and beliefs
> pertaining to one's own body. In contrast, a *body schema* is a system of
> sensory-motor capacities that function without awareness or the necessity
> of perceptual monitoring. This conceptual distinction between body
> image and body schema is related respectively to the difference between
> having a perception of (or belief about) something and having a capacity
> to move (or an ability to do something). A body image involves more
> than occurrent perceptions, however. It can include mental
> representations, beliefs, and attitudes where the object of such intentional
> states (that object or matter of fact towards which they are directed, or
> that which they are about) is our concerns one's own body. The body
> schema, in contrast, involves certain motor capacities, abilities, and
> habits that both enable and constrain movement and the maintenance of
> posture. (Gallagher, 2005:24)

For that reason, I argue that, as the pointe shoe causes the ballet dancer to develop muscles

due to her/his appropriation of the tool, the same must happen with dancers who create dance works

using technological mediation: they have to develop their sensorimotor knowledge. The difference

between both examples is that the degree of mediation in those artistic propositions is total, it is a

direct and inseparable relationship, as posited in the first section of this article. If the ballet dancer

dances in demi-pointe, not using a pointe-shoe, the work context is not upset. That is why merely

dancing at stage with scenographic projections, with which the dancer did not have to find

accessing forms, did not come across new perceptive demands, did not go through an embodiment

and embeddedness process, does not cause the "muscle" (sensorimotor knowledge) to be developed

in order to move along in the investigation of this field. It is not a matter of value judgement, only

of a field delimitation. It interests here the discussion on the varieties of presence in telematics

projects and how they contribute for the reflection about the dance on its own and about the world

where we live. How this strange tool (Noë, 2015) can provoke new ignitions for the dancer, new comprehensions of the body (of presence) for artists and the audience.

> Every work of art (whether dance, song, poetry, film, whatever) challenges you to *see* it, or to *get* it. The work of art (not the artist, nor the performer) says, *Bring me into focus, if you can!* Crucially, you usually can't, at least not right away (…) Art is a business of affording us the opportunity for just this kind of transformation from not seeing to seeing. In this way, art recapitulates a basic feature of our perceptual experience, to wit: that our consciousness of, perception of, access to the world around us do not come for free. We achieve them, by thoughtful and active looking. (Noë, 2015:102)

The audience also has to go through an embodiment and embeddedness process! The access is larger if the perception is exercised in that environment, in that situation. At some level, we can always access a piece of work, however culturally or socially far it may be. The enjoyment of the artistic work also demands some practice, it is necessary to practice the sensorimotor understanding It is worthy highlighting that our experience with a virtual other, with her/his not physical presence, is already embodied in our culture.

> This perceptual experience with the remote dancer is not new, it is not a creation of the digital world, the new technology only provided other ways to put people in touch, different ways to feel and manage our environment, and thus be able to understand it. Our experience with a remote person exist since we have the first 'telecommunication', primitive systems to put in touch the distant as the smoke signals, carrier pigeons, written letters, until we get the telegraph and the telephone, and, since last century, the digital tele-communications systems. 'Proprioception is the bodily sense that allow us to know how our body and limbs are positioned' (Gallagher, 2005:43) and this somatic proprioceptive information come from kinetic, muscular, articular, and cutaneous sources. This information summed to vestibular and equilibrium functions are very important for the maintenance of posture and governance of movement. These sensing inputs are responsible for our body schema and body image. (Santana, 2015:191)

In the last scene of EVD58, dancers danced with the graphic of the remote partner (Fig.1). That graphic was generated in real-time according to the dancers' motion capture. The graphic did not represent an avatar, it was not an anthropomorphic image, but the capture of the spaces occupied by the body in the given time. More than representing the trajectory of the hand's movement, for instance, the aim was to provide an image of the space-time occupied by that action. Besides, the whole sonority of the work, which could be considered the performance's sound track, was created from sounds generated by the dancers. That way, the dancer danced perceiving the voice, the breathing, the sonorities that rebounded from her/his own body and from her/his partner's body. EVD58 was one of the outcomes of the research "*Dramaturgia do Corpo (Tele)Sonoro*" (Dramaturgy of the (Tele)Sonorous Body), developed during my post-doctorate at the Sonic Arts Research Centre (Northern Ireland, United Kingdom), which elaborated the concept of organic, acoustic and synthetic sonorous body.
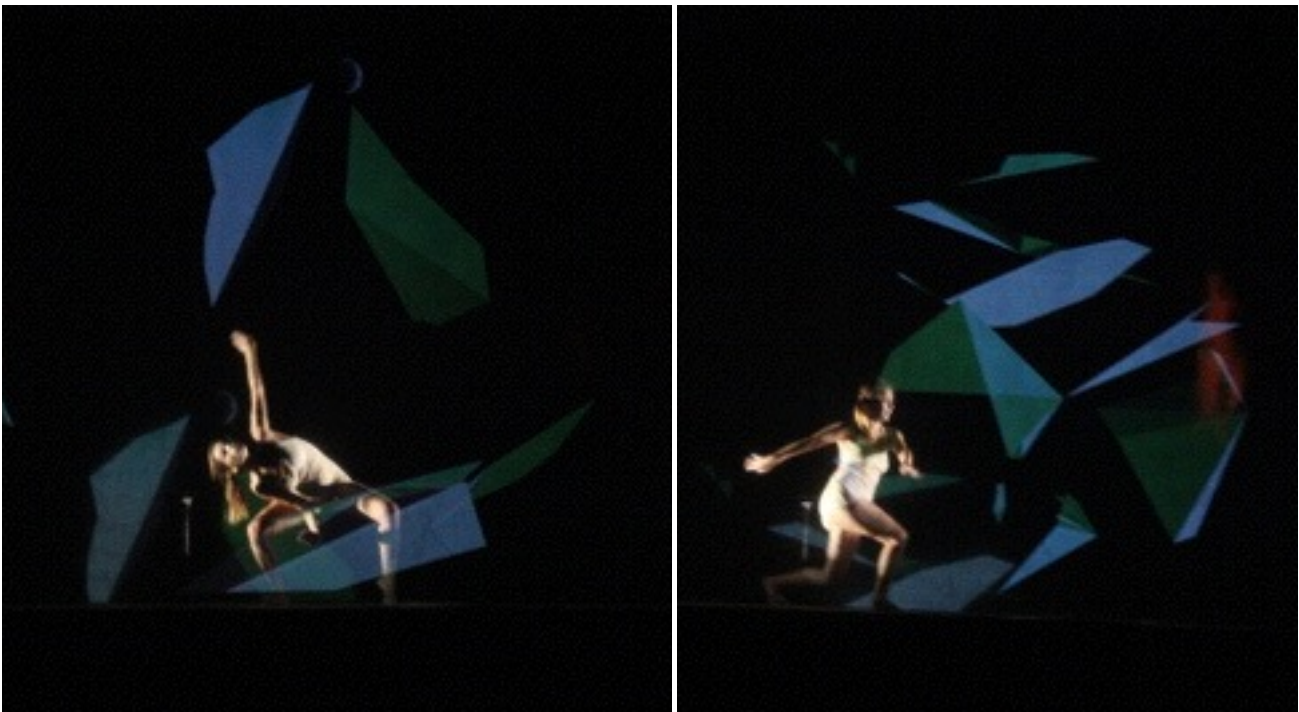
Fig.1: *Embodied in Varios Darmstadt 58* (2013) Brazil, Spain and Mexico.

Therefore, with the graphic images and the remote partner's presence, nevertheless without providing a human image, even as a graphic, the dancers learnt (through sensorimotor knowledge) to perceive the other via that degree of presence. The same way, they understood that their bodies were also seen by the other via a distinctive presence, but still a presence.

> It is important to note that our beliefs and attitudes towards our bodies, even if non-conscious, will have an effect on how we perceive our bodies and the bodies of the others. In this sense, the body image is not inert or simply an ideational product of cognitive acts; it plays an active role in shaping our perceptions. (Gallagher: 2005:26)

Body image is linked with perceptions, behaviors and beliefs related to the body on its own. Whereas body schema is a system of sensorimotor capacities working without the need for a specific attention or a perceptive monitoring, which does not mean to be isolated or completely independent. For instance, the greater the body image's construction in telematics environments, the more comfortable the sensorimotor capacities are when immersed on those environments. That means, when the creation and rehearsal process started in EVD58, the dancers (mainly the ones with no experience in Networked Art) might not have had a well-constructed body image of that situation. It was necessary for an embodiment process to take place, one in which several possibilities of perceiving and acting in that environment were tested, so that dancers could start to access the system in another way with a body image more coherent and bound to the setting. That process' practice stays in the body, re-orientates and re-capacitates the sensorimotor knowledge, therefore implicated in the body schema development.

Lab DCT, other than being an artistic proposal for public presentation, was created with the specific goal of investigating memory and presence in environments mediated by new media through a closed interdisciplinary group, composed by artists of dance, music, audiovisual and other artists, philosophers, architects and biologists. Following the theoretical-practical studies in cognitive sciences realized at the Post Graduation Program in Performing Arts (PPGAC) of Federal University of Bahia, Brazil, as well as in the Technological Poetics Research Group, Lab DCT elaborated three experiments called "modules of scenic experiments", in order to investigate concepts such as embodiment, enaction, extended mind, cognitive artifact, among others. The aim was to create demands for the dancers in environments mediated by digital technologies.

For this article's discussion, only the first "module of scenic experiments" will be analyzed. The stage was divided in two halves by a translucent curtain, separating the front from the back part. In each of those spaces there was a dancer. Those areas are niche 1 (area in front of the curtain) and niche 2 (the back area). Niche 3 was the area where the dancer operated a video camera capturing images from niche 1 in real-time. Niche 4 was the one with the dancer who was with a microphone only audible to niche 2.

Fig.1: Lab DCT - Laboratory Dance-Cognition-Technology, "1st interdisciplinary Meeting of Dance-Cognition-Technology", (2016, Brazil).

The experiment took 20 minutes, being 5 minutes for each of the following parts: a) interaction of niches 1 and 2; b) beginning of niche 3; c) beginning of niche 4; d) finalization with pre-recorded images. a) The dancer in the niche 1 was requested to create movements that could be captured through the camera attached to her/his body (at the sternum bone); images were projected at the screen (curtain) separating the stage. The dancer in niche 2 was asked to dance only based on the information received through the devices, that is, images projected and amplified sounds. b) Niche 3's dancer was responsible for capturing images of the dancer in niche 1 that related with what dancer 1 was capturing with the device on her/his body. That second image was projected besides the subjective image of dancer 1. c) Niche 4's dancer should narrate actions created by niche 1's dancer, however using the discourse in first person. d) With all niches in action, images captured in real-time were mixed with pre-recorded images.

The goal was to perceive to which point each niche's dancer was contaminated by the system, or if they kept to their individual and specific function. There was no interest in aesthetic issues arisen, the objective was to observe and analyze how each dancer's perception was triggered and triggered the setting. The experiment was repeated with 4 distinct groups, following the same times and criteria. We may conclude that the presence of niche 1's dancer was absorbed in many ways by niche 2's dancer. The most interesting is that all reports were that, at some level, all of them ended up being contaminated by the system as a whole, including the niche 1's dancer, who could be considered only the process starter, an ignition without feedback. Contrary to the expectation, the process worked in a systemic way and as a network, and even niche 1's dancer reflected the system's flow.

Conclusion

The analyses of the works presented show how presence cannot be bound to the idea of physical proximity, of the flesh-and-blood body, of here-and-now as it is usually considered. There is no virtual body in power or latency, but a body really present at some level which is responsible for the creation of the dancer's body image and, therefore, also of her/his body schema. There is some sort of romanticism in the dance community, which leads to the belief in bodies' relationships only through physical contact. Our western culture has demonstrated that we are in direct contact with people in the most varied forms, other than simply the physical contact. The understanding of technological mediation as a process of distancing from the body, or even as a cold system due to the technological devices, is no longer pertinent in the face of so much knowledge acquired, of the understanding the human being through the situated cognition perspective. Performances distributed in telematics systems must work as strange tools to cause people to rethink, to reflect and even to contest relationships, perceptions and actuations among subjects embedded in the digital culture.

References

CLARK, Andy (1997) *Being There: Putting Brain, Body, and World Together Again.* Cambridge, London: Bradford Book, MIT Press.

_____ (2003) *Natural born-cyborg.* Oxford: Oxford University Press.

_____ (2009) *Dispersed Selves.* Leonardo Electronic Almanac. Vol. 16 Issue 4-5. 1-7. Available at: <http://www.leonardo.info/LEA/DispersiveAnatomies/DA_clarke.pdf>. Accessed on 10 January, 2015.

DAMASIO. A. *E o cérebro criou o homem.* São Paulo: Cia das Letras, 2011.

GALLAGHER, S. (2005) *How the body shapes the mind.* Oxford, New York: Oxford University Press, 2005.

HUTCHINS, E. *Distributed Cognition.* IESBS.2000. Available at: <http://gnowledge.org/~sanjay/ Advanced_Cogsci_Course_2015/Week3/Week3_DistributedCognition_1.pdf>. Accessed on 05 January 2015.

LAKOFF, G. , JOHNSON, M. (1999) *Philosophy in the Flesh: The Embodied Mind and its Challenge to Western Thought.* New York: Basic Books.

NOË, A. (2004) *Action in Perception.* Cambridge: MIT Press

_____ (2012) *Varieties of Presence.* Cambridge, London: Harvard University Press.

_____ (2015) *Strange tools: art and human nature.* New York: Hill and Wang. A division of Farrar, Straus and Giroux.

SANTANA, I. (2014) *'Silence, noise and presence of the tele-sonorous body'.* Electronic Journal MAPA D2 - Map and Program of Art in Dance (and Performance) Digital, Salvador, pp. 54-71. Available at: <http://www.portalseer.ufba.br./index.php/mapad2/article/view/10098>. Accessed on 15 January 2015.

SANTANA, I (2015) *'Moist Art as telematics dance: Connecting wet and dry bodies'.* In: Technoetic Arts: A journal of Speculative Research. Intellect Books. Volume 13, Issue 1-2, June 2015, pp.187-201. Available at: < http://www.ingentaconnect.com/content/intellect/ta/2015/00000013/f0020001/art00014 > Accessed on 05 January 2017.

WILSON, M. (2002) *"Six views of embodied cognition".* In: Psychonomic Bulletin & Review 2002, 9 (4), 625-636. Available at: <http://www.indiana.edu/~cogdev/labwork/WilsonSixViewsofEmbodiedCog.pdf> Accessed on 05 January 2017.

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Ivani Santana is a dancer and artist in Art Media. She is a professor at the Institute of Humanities, Arts and Sciences, and Post Graduation Program in Performing Arts. She holds a Masters and a PhD in Communication and Semiotics (Brazil), and a Post-Doctorate in Sonic Arts Research Center (UK 2012/13). Her books: "Open Body: Cunningham, Dance and New Technologies" (2002) and "Dance in Digital Culture" (2006). In 2006, she was awarded with the "UNESCO Prize for the Promotion of the Arts – New Technologies" at the Monaco Dance Forum and the Artist Residency at the National Centre Chorégraphique (France). Since 2005, she conducts researches in telematics dance. She is a coordinator of the Research Group Technological Poetics <www.poeticastecnologicas.com.br>