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PERSONAL AND MORAL IDENTITY
IN THE 4th SPACE

ABSTRACT

The 4th Space concept is a very challenging and puzzling one. The tremendous technological progress of Information and Communication Technologies (ICTs) or Computer-Mediated Communication (CMC), ubiquitous computing, and Extended Reality (XR) make the Gibsonian Cyberspace Matrix an imminent reality in the future. Although, some features can be made more salient, the structure, but most importantly, the effects of living in such environment for human consciousness and morality is almost impossible to predict. Hence, the requisite of a proactionary and comprehensive scientific and technical paradigm for designing the 4th Space, in order to facilitate the adaptation of human species to the brave new technological world, while preserving the humanness and humanism of the humans.

Keywords: 4th Space, cyberspace, Information and Communication Technologies (ICTs), rhizome, autopoietic systems, ubiquitous computing, ISelf, infraethics, dispersion of responsibility.

INTRODUCTION

This article outlines an epistemological and conceptual framework for understanding the envisaged 4th Space as the "onlife" living environment. The 4th Space will be analyzed based on the homology and continuity between physical, psychological, social and cultural spaces. In the beginning, is highlighted the foundational role of the space in the genesis of the Self and personal identity. After this, it will be presented the hybrid nature of the 4th Space based on the latest conceptualizations draw from ICTs, technological extended reality (XR), virtualization, ubiquitous computing, and psychology. It is argue that the paradigm of autopoietic system is the most suitable for understanding the formation personal and moral identity within the 4th Space. In addition, the particular processes affecting the personal identi-

ty within the 4th Space onlife environment are discussed in terms of the rhizomatic model of development and using phenomenological approach. In the proposed framework, are made salient the limitations of the current scientific paradigm in terms of its inability to ensure control and safeguard the humanness from the blind consequences of technological progress. In the end, will be discussed some epistemological, methodological and educational challenges and are proposed paths for future researches.

The notion of 4th Space is definitely a romantic one, in a double sense. Firstly, because it is an idea that "release[s] from, or transcendence[s] over, ignominious or uncomfortable circumstances" (Smith, 1996, p. 6). It elevates our imagination above our mundane condition of beings who adapt themselves to an external environment. It feeds the need of self-improvement and self-development of human soul, its poietic sense of the world, because the world ceased to be a given thing in itself, but it is how we experience and co-create it. It is a promise of enhancing our social world and fulfilling our innate need for relatedness. Secondly, because its conceptualization doesn't withstand yet the rigors of social sciences analysis. Its conceptualization is still about a prospective reality. And this, is not just a limitation, but both a sign and a warning. A sign that, in our increasingly technological environment dominated by scientific paradigm of understanding the world, we need the humanities to keep our humanness alive. A warning, but also an opportunity, for the modern science paradigm to become aware of the necessity to acquire the near future and the forthcoming states of the world as a legitimate object of study. Otherwise, it risks being each time one step behind the social and technological advancement and its knowledge to be always outdated. Most important, it risks to be unappropriated and even harmful to our self-understanding.

SPACE AS THE FOUNDATION FOR SUBJECTIVITY

The physical space is the condition *sine qua non* for living in the world that precedes thinking: hence it is very opaque to analysis. The cognitive development and the psychological space are build based on concrete operations and movements in physical reality (Piaget, 1952). Even though psychological space (and time) are subjective conditions of knowledge and mental life, they must have "objective" value, i.e. they are valid for all individuals, because they were shaped in the environment-organism interaction that necessarily imprinted on us the features of objective reality. It would be impossible for the human species to survive if its subjective forms constantly and completely distorted the data of the objective world" (Joja, 1971, p. 190).

Space perceived as given reality for a consciousness is not an empirical concept or representation because it is already presupposed at the ground of

things represented as being outside. It is a condition of possibility of all experience (*appearances*) given as outside reality and we cannot imagine there is no space (Kant, 1781). Although space, as a subjective condition of conscious sensibility, is a necessary representation at the ground of all experiences, its a *priori*-ness does not exclude a genesis and an unceasingly and unconsciously process of reinstating. The individual perceives and recognizes the world as a given environment and "materializes" it as stable or as given reality by manipulating objects and making movements in space. The sense of reality is given by the unconscious and continuous connection with the environment/objects.

At its origin, space is related with the human body. As John Eliot (1987) shows, the space as psychological reality is the result of a combination of visual perception, touch, and movements: sensory integration, perceptual awareness, bodily awareness and the coordination of physical movement, skillful performance of spatial tasks, conceptual experience that transcends the perceptual moment and provides direction to our behavior. The 4th Space concept deepens the psychological integration and upholds the defining role of psychological space for human life to the detriment of physical space. The 4th Space is a mental-virtual-physical space and from here the vital importance of and effect on psychological processes. The plasticity and dynamics of virtual space, that can be construct and change in unimaginable ways the context of communication and perception pose a great challenge for human psychic. Reality and its spatial aspect/dimension are our perceptual awareness of relationships surrounding us and our thinking about them are independent but related aspects of human cognition. Also, perception and cognition are largely independent, but still affect each other in systematic ways (Montemayor, Haladjian, 2017).

In this context, the question of the 4th Space announced itself from the beginning to be very intriguing. As it emerges both as environment and an extension of the psychological space (thoughts, memory, representations, knowledge and so forth) it will be dissimilar to the physical space of things, people and places, to which we are evolutionarily adapted. It is a space in continuous dynamics, updating its forms, a relational mobile space based on communication and virtual representations. Such characteristics will challenge the human evolutionary ability to orient and locate in "reality."

This is so, because the fundamental importance of space is not limited to the physical aspect of the human body. It is at the origin of human subjectivity, too. Primary and even deeper beneath of the self-consciousness (or transcendental ego) the subjectivity is based on the relation to the environment, perception and movements Kimura (2000). Any living being is formed by reactive modification of the inner world and consequently to unceasing modifications in the external world. Subjectivity as such is made possible by the permanent interconnection between the living organism and the envi-

ronment. This subjectivity, basically, "unrelated to consciousness, is what we call "self" (*jiko*), a principle of the connection which is established between the individual and the world and which is to be thought of as an extension of the physiological subject." (Kimura, 2000, p. 85, my translation) The conscious living presumes incessantly recognitions of the perceived objects as a given reality. But it also relates with them preconsciously, prior to recognizing them as real. This unconscious virtual perceptions of the things relentlessly emerges contingently in the conscience. The process is made possible by the pre-personal bodily self when they become individuated through actualization, adding the key input for realizing the sensation of actuality at any given moment of life. This phenomenological process is more fundamental and parallel with cognitive operation of consciousness and able to accommodate any type of space as being real, i.e. being experience as "given real space." It also opens up the possibility for different forms of transcendental conditions for the possibility of things. Likewise, it becomes more significant for the 4th Space reality where the relations between things are overpassed and lessened by the relations between persons, virtual persons, and artificial "persons" intelligences.

The seemingly familiar physical space is, in fact, very difficult to be described, as long as it is both reflected and constructed as psychological space. What people believe that they understand or experience by physical space is already a psychological construct, and usually is confounded with its abstract geometrical representation, i.e. a classical "category mistake" (Ryle, 1938). What we "thought" of being physical space is ontological and epistemological hybridization of human bio-physiology and physical reality. It is one of the multiple entities that form the psychological space. And the task of describing psychological space is almost impossible at this moment in spite of its apparent familiarity. We don't have a suitable language system able to represent and convey the complex interplay of mental and physical elements, we can only asses a very limited range of spatial phenomena with available measuring instruments or procedures of spatial behaviors and "we lack a construct which accounts for both our awareness of the relational distribution of things and our use of this awareness to solve problems" (Eliot, 1987, p. 6).

At the same time, it is certain that there is nothing in human experience that can remain purely abstract as there are ideal abstract concepts from Mathematics or Physics, for example. People can think the abstract, but they cannot live (in) it. Human thinking appeals to the concrete that is mostly based on representations and images. In addition, people cannot think and feel value-free or emotionless. Any experienced reality is appropriated by their lived experience. The living physical space becomes place ("own space"), due to its familiar psychological dimension, which implies orientations, repeated actions, organization of representations, utility and memory.

"Physically, a place is a space which is invested with understandings of behavioural appropriateness, cultural expectations, and so forth. We are located in 'space,' but we act in 'place.' Furthermore, 'places' are spaces that are valued. The distinction is rather like that between a 'house' and a 'home;' a house might keep out the wind and the rain, but a home is where we live." (Harrison, Dourish, 1996, p. 69)

In order to understand the notions of space and place, the current mainstream paradigm of psychology should incorporate elements for phenomenological approach. Otherwise, it provides only an illusion or, at least, an insufficient knowledge of what is space for a human being, an essential element of Self formation.

THE 4th SPACE: SPACE OR PLACE?

It has become clear now why the concept of the 4th Space seems so natural, but so hard to grasp. Its origins are to be found in the Ray Oldenburg's influential book *The Great Good Place* (1989), in the domain of communities building. This is the first trace in its conceptualization. The 4th Place (Space) is depicted as a heavenly communicational and relational place that fosters and grows human communication, relationships, works, facilitating access to and exchange of knowledge etc.

"The fourth place blurs the frontier, within the same space, of the first (home), second (work), and third place making the space, a place in itself. The function of the 4th Space is to foster networking, to promote mingling, and to favor collaboration, face-to-face interactions, and the exchange of tacit knowledge." (Morrison, 2019, p. 448)

This conception bestows space with human attributes and unavoidable changes it into more than a simple space, a place.

The distinction between space and place is a very interesting and complex one. Place is an anthropomorphic space. Unlike space, the place has meaning, history, implies knowledge, attitudes and feelings. We can speak about a sense of place, but not about a sense of space (Tuan, 1979, p. 421). The 4th Space, as computer-supported cooperative work (CSCW)

"is rooted in sets of mutually-held, and mutually available, cultural understandings about behaviour and action. In contrast to 'space,' we call this a sense of 'place.' Our principle is: 'Space is the opportunity; place is the understood reality'." (Harrison, Dourish, 1996, p. 67)

Hence, despite our endeavor to conceptualize and understand the 4th Space in itself, in real experience it will never exist separately from how it is felt.

Any space is impersonal, the place has identity. Space means order, place means familiarity. The space is common, neutral and imposed, and lack of any sense of belonging. A place, formed by actual living or by any other significant form of contact, is always unique, personal and created. The space is abstract, the place is lived. In space things are unrelated and indistinct, while the place involves connectedness and distinction. In any spatial located human interactions, from physical intercourse to computer mediated communication or cooperative work, the space is made by interconnection and communication. Its "ontic" multi-dimensionality (the three physical dimensions, parallel virtual space, or multiple, in extended reality) forms its appearance: an empty condition of possibility. The 4th Space is formed in actual intercourse of people, when its condition of possibility is converted in a communication place, because the space itself is meaningless and has no proprieties useful as such for human actions.

In addition, the social and cultural spaces subtly interweaved within the psychological sense of space and make it more difficult to understand. Any organism "takes its place within, toward, against an environment." Humans, in addition, once they achieve humanity, occupy their place in a world defined by roles, responsibilities and institutions. "All his life, his existence as a person is constituted by such 'place-taking'." (Grene, 1968, p. 173).

The mental spaces differ from individual to individual according to personal experience. And every culture draws different mental topographical spaces (Hall, 1966). Moreover, people are also actively "position takers."

> "The most characteristic thing people do as persons is to take positions or stances toward the elements of their experience. People take positions on events, others, issues, policies, attributes, actions, themselves, and on the positions they take. People take positions on concrete aspects of an immediate situation, on life as a whole, and on the cosmos." (Cochran, 1985, p. vii)

The continuous virtualization of the social and communicational space, technologically mediated by digital and augmented reality, amplifies all the aspects of psychological space. "The construct of psychological space refers to such an amalgam of physical capacities, mental processes, learned skills, forms of representation, and dimensions of thought at different levels of awareness for different tasks in changing surroundings." (Eliot, 1987, p. 6). It includes has some important characteristics relevant to the future development of human psychology in its dialectical process of human-living environment co-creation. Beside its common characteristics as mental basis for a set of behaviors at different levels of knowing, multimodal form of representation, a form of behavior related to the awareness of the limits and position in different environments, psychological space is also: a pervasive cognitive phenomenon, a form of symbolic processing, an expression of intelligence intricate in the higher and complex knowledge and responses to spa-

tial tasks, implied in daily activities, and even a possible dimension in many kinds of thought (Eliot, 1987, p. 6).

THE HYBRID ONTOLOGY OF THE 4TH SPACE

So, what is it, a space or a place? The term "4th Space" instead of "Place" is supported as an analogy with physical space, but only if it is conceived as an ontological reality where things are located and processes take place and because they can be "represented," localized, and become visible and portrayed through three axis: place, medium and time (Hardegger, 2021). In this framework, the "Place-Axis" represents the grounded connection or anchor into physical of the real word place, the localization of the people immersed in the virtual cyberspace. The "Medium-Axis" represents technological supporting infrastructure, hardware and software. The "Time-Axis" represents the timeframe coordinate of user presence within the 4th Space, where the physical time distinction of synchronic/asynchronic interactions dissolves. All three dimensions form a new reality in which their correspondent from the physical reality is transfigured. In the 4th cyberspace, the physical space location of the user intertwines with its location in the digital/virtual space. The medium is both the interface and the sensorial constitution of the user.

This image is useful for theorizing on the 4th Space as epistemological entity. It provides a suitable framework for organizing the research both from different disciplines and interdisciplinary approach. However, it can still uphold a deceptive image of what cyberspace reality is by perpetuating an image of it as a preexisting territory and a metrical space. Its medium-axis component presupposes already the engineered devices and mathematical algorithms and this reduces the 4th Space to "a set of objects and rules of interaction." Its ready-made nature, "waiting to be filled" and the topographical description induces a false and apparently stark division between "real" and "virtual" worlds which is simple not true" (Mihalache, 2002).

The essence of the 4th Space is communication. In the physical space, things, states and processes are interpretations, signs, landmarks and so forth. But the 4th Space is in itself no other thing than information and communication made possible by digital virtualization. The process is similar to the cosmogenesis where the universe appears *with* space and time and not *in* space and time (the cosmic metric expansion of space-time). In the case of the 4th Space we cannot talk about a space filled *with* information, but about a space *of* information. Its very nature is information and communication.

"The structure of cyberspace represents a hierarchy-based system of technical and semantic layers (physical, logical, information, and human) that are heavily linked to each other. The most important goods in this space are information, which is used by people, thus creating their new living space." (Gálik, Tolnaiová, 2019)

The 4th Space is one of the multiple types of culture-generated spaces as are the economic or social spaces and cannot be reduced neither to the mental space or external space. It is rather an (collective) extension of psychological space (Suler, 2016). The 4th Space completes (and at the same time modifies) Karl R. Popper's (1968) idea of three worlds, filling the point of interaction between World 2 (the realm of natural states and processes of ICTs devices) with World 3 (the objective realm of the "products of thought"). Reality, subjectivity, and representation become a triune composite. The field of reality (the physical world), the field of representation (the virtual reality) and the field of subjectivity (the individual) merged in a continuum subject-object-context of onlife living. The tension between connectedness and distinction dissolves. Technological progress made possible the extensions and substantiations of human imagination.

4TH SPACE AS TECHNOLOGICAL EXTENDED REALITY (XR)

The 4th Space ontology is hard to be conceived (represented or imagined) because it has a very heterogeneous, complex and dynamic nature. It is more than people using and communicating on their laptops and smartphones. The 4th Space has an insidious ubiquity and from this the difficulties to understand what its reality is. In XR, we find the second trace for the 4th Space conceptualization. Here, all the human functions, abilities, potentialities are transformed, magnified, extended, augmented and mediated. CSCW is accomplished as the 4th Space in the framework of *ubiquitous computing* (or *pervasive ambient computing*). It comprises an enmeshing of the properties of various types of intelligent devices that unfold the physical world in an ameliorated virtual reality of communication, interrelations and perceptions permeated with huge amounts of collective knowledge. However, even the nature *of* pervasive ambient computing is difficult to grasp in a clear-cut image. Stefan Poslad (2009) observes that the definitions and descriptions of pervasive computing are overlapping and puzzling. Therefore, he proposes that it can be better understood by a taxonomic systematization of its proprieties: *distributed system properties*, *implicit human device interaction*, *context aware*, *autonomy*, and *intelligent system properties*.

The proprieties of the 4th Space result from the synergy of ubiquitous computing individual devices, programs, networks and multiple agent sys-

tems. Like the less practical endeavor to define ubiquitous computing, the 4th Space reality can be better understood as the result of the dynamic system of myriad of artificial (intelligent) entities with mixed and diverse proprieties. The *distributed system properties* can be universal (seamless or heterogeneous), networked, synchronized (coordinated), open (transparent or virtual), or mobile (nomadic). The *implicit human device interaction* covers proprieties as non-intrusive (hidden, invisible or calm computing), tangible (natural), anticipatory (speculative or proactive), affective (emotive), user aware, post human, or having a sense of presence immersed (virtual or mediated reality). According to their capacity to be *context aware*, the systems can be sentient (unique, localized or situated), adaptive (active context aware), person aware (user aware, personalized or tailored), environment aware (context aware or physical context aware), or ICT awareness. From the point of *autonomous system properties* they can be automatic, embedded (encapsulated or embodied), resource constrained, untethered (amorphous), autonomic (self-managing or self-star), or emergent (self-organizing).

The *artificial intelligence* can be individually or collectively distributed. The individual intelligent systems can be reactive (reflex), model based (rule/policy based or logic/reasoning), goal oriented (planned or proactive), utility based (game or theoretic), or learning (adaptive). Multiple intelligent systems (collective or social intelligence) can be cooperative (collaborative or benevolent), competitive (self-interested, antagonistic or adversarial), orchestrated (choreographed or mediated), task sharing (communal, shared meaning or knowledge), speech act based (intentional or mentalistic) or emergent (Poslad, 2009, pp. 17–22).

The 4th Space arises from the synergy of the diverse proprieties of various devices and systems and creates a novel dimension for human existence. The ubiquitous computing does not only create a space but, by customized adaptation to user preference, builds a new place.

VIRTUALIZATION AS CULTURAL EVOLUTIONARY PROCESS

The third trace for understanding the nature of the 4th Space is its virtuality. Virtuality is another key element for understanding the 4th Space, but more in the sense of communicative structures, not in that of artificial reality. In this sense, the 4th Space history and genesis is longer than many may think. The communicative virtual communities existed long time before the Internet (Stone, 1991, pp. 94–95). Its origin can be found in the first *virtual communities* created by the invention and dissemination of the texts. Textual virtual communities fostered a community of like-minded persons

through intellectual interchange mediated by books. It has endured today in the network of scholarly publications. The next stage of building virtual community was the rise and spread of *mass media.* Early electronic virtual communities (made possible by radio and television) connected people synchronously and made it possible for many people to be transposed and being "present" in the same informational location from remotely physical space. The next stage, the *era of information technology* of the World Wide Web represents the true birth of active virtual communities. The commonality fostered by passive reading community of knowledge became active and interactive, "a participatory social practice in which the actions of the reader have consequences in the world of the dream or the book." In the third stage,

> "… the older metaphor of reading is undergoing a transformation in a textual space that is consensual, interactive, and haptic. […] The boundaries between the social and the natural and between biology and technology are beginning to take on the generous permeability that characterizes communal space in the fourth epoch." (Stone, 1991, p. 95)

The last epoch, that of "real" virtual reality, is thought to be fully accomplished in a space akin to Gibsonian Matrix (Gibson, 1984). In the maturated 4th Space the real and virtual will merge in an inter-psychic network of a communicational field that extends the physical reality in a new one.

In contradistinction to virtual reality, which evokes artificiality, the bogus or constructed character, the non-real, and hence emphasizing reality, the cyberspace highlights inclusively the actual place. The 4th Space is rooted in cyberspace and even opposed to virtual reality because it "does not rely mostly on a deception of senses to create the illusion of an integral realism," but it is a space for computer mediated communications (Holmes, 1997, p. 234). The cyberspace exists only as a communicative function of its inhabitants. A single person exists only in virtual reality, but not in cyberspace, because the critical element cyberspace is community (Ostwald, 1997; Benedikt, 1991).

Due to its particular characteristics, communicational nature, pervasive computing, and XR, it is more than a reasonable expectation that the new onlife living to have a meaningful effect on the basic sensory-psychological coordinates of space and time on which personal identity is initiated. The prolonged onlife living (Floridi, 2015) within the 4th Space will definitely have dramatic effects on the personal identity construction, as long as living "in reality" is based on cognitive operations and bodily actions.

LIVING IN 4th SPACE EFFECTS ON PERSONAL IDENTITY

The difficulties in crystalizing a coherent personal identity in modern world are illustrated by the big challenge in understanding the living environment, i.e. the dynamic enmeshing of physical, augmented and virtual reality of onlife world (Floridi, 2007). Personal identity is much deeper molded by our new "onlife" way of living, embedded in ICT's technology and digital relationships, which changes "our self-conception (who we are); our mutual interactions (how we socialise); our conception of reality (our metaphysics); and our interactions with reality (our agency)" (Floridi, 2015, p. 2).

In order to prospect how the prolonged living in 4th space can alter the personal sense of identity, we cannot rely solely on current mainstream psychology because the algorithmic structure, methodological quantitativism and underlying computational paradigm, though very useful for some epistemological goals, are of little use for catching the dynamic process of personal identity formation. The (post)modern identity needs to employ a more complex approach and conceptualizations, although not as simple to understand and impossible to be algorithmically modeled. I am referring to the rhizomatous conceptualization and the phenomenological approach.

THE RHIZOME AND RHIZOMIALITY

During these times of technological changes and challenges, understanding the systemic factors contributing to the transformation of the personal and moral identity of nowadays person(s) is a very difficult task because the formation is not a linear and homogenous process. The difference in Self-formations becomes increased because the changes brought by onlife living in personal identity are facilitated both by rhizomatous characteristics of the self (Baldwin, Greason, Hill, 2018) and by the "rhizomality" (Deleuze, Guattari, 2005; Deleuze, Guattari, 2005) of the contemporary (digital) social space (Kalantzis-Cope, Gherab-Martín, 2010). In my view, the rhizomatous pattern of conceptualization is a more suitable framework for grasping the formation of the 4th Space inhabitants' personal identity.

A rhizome is an onto-epistemological model of heterogeneous multiplicity in which the organization of the elements does not follow a subordination line. "A rhizome is not amenable to any structural or generative model. It is a stranger to any idea of genetic axis or deep structure" (Deleuze, Guattari, 2005, p. 8). Connection, heterogeneity, multiplicity, asignifying rupture, cartography and decalcomania makes rhizomatous representation the best candidate for understanding the dynamic of identity and moral development of digital natives (Deleuze, Guattari, 2005). The dialogical, relational and

hybrid nature of interactions in the 4th Space are reflected in the construction of the personal identity as narrative ISelf (Popoveniuc, 2017). We are permanently connected in physical and virtual life with others by knowledge, interpreting and applying rules, norms, and different values. Living onlife means a heterogeneous life where the virtual and physical realms dialectically reinforce each other. In the 4th Space, physical reality and extended reality intermingles in a uniform hyperreality where human and artificial intelligence fuse (Tiffin, Terashima, 2005). The seamless fusion of the physical and the virtual and of the digital semantics and human cognition is facilitated by the rhizomatous proprieties of the mind and the cyberspace.

> "Any point of a rhizome can be connected to anything other, and must be. […] A rhizome ceaselessly establishes connections between semiotic chains, organizations of power, and circumstances relative to the arts, sciences, and social struggles. A semiotic chain is like a tuber agglomerating very diverse acts, not only linguistic, but also perceptive, mimetic, gestural, and cognitive: there is no language in itself, nor are there any linguistic universals, only a throng of dialects, patois, slangs, and specialized languages. There is no ideal speaker-listener, any more than there is a homogeneous linguistic community." (Deleuze Guattari, 2005, p. 7)

The very nature of the 4th Space embodies a real multiplicity of states, realities, knowledge and values. There is no fixed point, be it ontological, axiological or semantic, to support the complete division of subject and object. Individual humans become only parts of the multiplicities of semantics, virtual and cognitive realities in the vast networks of multi-agent system. In the rhizomatous paradigm, "the multiple is effectively treated as a substantive, 'multiplicity,' that it ceases to have any relation to the One as subject or object, natural or spiritual reality, image and world" (Deleuze, Guattari, 2005, p. 8).

And there is another reason why the rhizome model fits better to understand the contemporary reality. The fast pace of digital transformation, augmentations and amelioration of humans, environment and culture puts us on the progression path toward "trans" and "post" humanity. It is consonant with the transhuman state of modern man which is significantly technological (bio)ameliorated (by taking pills, wearing glasses, cognitively extended capabilities etc.). The prefix "trans-" acquires and expresses the dynamic processual state of "meta-" being "in the middle of" but at the same time "beyond" and "between" (Sorgner, 2020). The 4th Space expresses both, in its ontological reality, the "trans-" or "meta-" space of reality and, in its sociological nature, the "trans-" or "meta-" sociality. Similarly, "a rhizome has no beginning or end; it is always in the middle, between things, interbeing, intermezzo" (Deleuze, Guattari, 2005, p. 25).

The consequences of living and thinking in such rhizomatous environment are far more thoughtful. The virtualization of *technics* and technology in the forms of digital and XR, as a process of reversal exteriorization of autopoietic human cognition into the environment, accomplished the "closure of the cortical evolution of the human" and opens the way for *the pursuit of the evolution of the living by other means than life* (Stiegler, 1998, p. 135).

A PHENOMENOLOGICAL APPROACH OF THE 4TH SPACE

Any living beings maintains the continuous contact with its environment in order to survive. This is also true for the groups of any species. The contact can be represented by physical surface of the body or by any of its surrogate a cane, car body, computer screen, VR glasses etc.

> "Our self-awareness, our experience of the 'I', is based on the *Tatsache*—an expression literally meaning 'the thing of acting'—that is, things or objects perceived in the outer world or imaged in the inner world, are associated with a quality of actuality, *Wirklichkeit*, which endows the perceived objects or imaged with a sense of reality, and the perceiving or imaging subject of experience, an 'I'." (Kimura, 2008; cf. Kimura, 1963, p. 391)

When this phenomenological character of qualia is disturbed, the pathological state of personalization can occur. The sense of reality of the external world and the sense of [its] own existence results from the same processes.

The individual subjectivity, understood as a "continuous discontinuity" relation with the surrounding environment, is doubled by collective subjectivity of appurtenance group (and groups). "This fusion of the human I with the auto-affection[1] of life in general, constitutes a necessary condition of a healthy mental state" (Kimura, 2001, p. 336).

Kimura's psychiatric conception hypothesizes a certain fundamental dissociation between individual existence and existence as a constituent of the species, as the fundamental process affecting the I-sense in the schizophrenia. In the context of our discussion on the personal identity formation within the 4th Space, the "schizophrenia" should not be taken in its psychiatric sense, but as a model or label for any other different or alternative mode of the sense of Self formation and, hence, of constituting the self-identity. The continuous mediated and intermediated contact with exteriority can elevate a higher level of self-reflection and self-reference which entails a deep uncertainty about "the I-ness of the self or the selfness of the I." This basic dis-

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[1] *The affection of the self by the self*, the purely immanent, unmediated self-affecting relation is a key term in Henry's phenomenological conception. "Auto-affection is the internal structure of the essence whose property is that of receiving itself." (Henry, 1973, p. 236). "Auto-affection thus describes how life affects itself and how it receives its affect" (see Sackin-Poll, 2019).

turbance of "discordance between individual subjectivity and the collective subjectivity to which one actually belongs" can be "a potentiality inherent in all human beings" (Kimura, 2001). But his disturbance can be conceived, not necessarily as "discordance," but as an expression of the plasticity of the I-Self that can "accord" in many ways with the collective subjectivity. The subjectivity can be differently constructed, alike its space(s) as condition of its possibility. Onlife living in the 4th Space can thicken the borders of I subjectivity and group subjectivity due to the dissolution of Otherness in virtual avatars and mediated homogenous reality. Or, on the contrary, it can facilitate a more harmonious integration of the individual and the collective self.

No matter if we are optimistic or pessimistic about the human integration and amelioration with and within technological progress, the onlife virtual-real living will have profound effects on the basic mechanism of constructing personal identity and self and the sense of the "I" as personal subject of experience and action. The consequences of prolonged life in the techno-environment will be, definitely, more complex, deep, and diverse. The growth in consistency of the 4th Space implies an increasing dependency on technological created reality and increasing living in blended reality that can blur extensively the borders of "here and now" (Waterworth, Hoshi, 2016). The effects of prolonged living and extended interactions with virtual and augmented environments does not exclude even the possibility to "lead to more fundamental changes, not only on a psychological, but also on a biological level" (Madary, Metzinger, 2016, p. 4).

We see now that the 4th Space is neither "a new stage of *etherealization* of the world we live in," nor "a new stage in the concretization of the world we dream and think in," but another genuine "venue for the consciousness itself" (Benedikt, 1991, p. 124), a new existential dimension of man (Gálik, Tolnaiová, 2019). This claim can sound bombastic or unusual within the mechanistic and positivist epistemological paradigm of the mainstream sciences. But it becomes not only natural, but self-evident, once it is set in the required new epistemological paradigm of ICT described above. The homogeneity between Self/personal identity and the 4th Space is more salient when we take into account their similar process of autopoietic genesis.

Identity as autopoiesis

The living beings and the conscious beings form themselves in a process of autopoiesis. An autopoietic system is a dynamic self-sustaining

"network of processes of production (transformation and destruction) of components that produce the components which: (i) through their interactions and transformations continuously regenerate and realize the network of processes (relations) that produced them; and (ii) constitute it [...] as a con-

crete unity in the space in which they (the component) exist by specifying the topological domain of its realization as such a network." (Maturana, Varela, 1980, p. 79)

In short, the autopoietic system continuously self-produces both itself, as a network of the production processes, and its own space, its boundaries. As the Universe appeared *with* its physical time and space, the self-poietic systems produce themselves *with* their own space (and time).

> "Life is realized in a space of its own to inhabit it, but it does not form itself in a space designated by an observer, everything is integrated into the organism itself. The formation of oneself is at the same time, so to speak, the formation of a space which is proper to it." (Kawamoto, 2011, p. 352)

They form for themselves by virtue of their own operation that also provides their own domain of existence. This does not exclude the influence of the outer world, because the self-poietic systems do not appear in void but within an environment to which they adapt accordingly. The formation of the Self through auto-genesis is akin to that, but at a different level of virtualization. The 4th Space is just another niche for the evolution of life as a cognitive and information autopoietic system. The intimacy of Living Space and Self Identity genesis is revealed by their common mechanism of formation, i.e. the autopoiesis.

In Hideo Kawamoto's conception of self-poietic systems, the self is a self-poietic system that emerges through its own actions and movements. It creates the borders of the self and non-self. It self-produces itself through bodily action "by doing something" and less by cognitive sense of "knowing something." In this process one produces reality through action, persons, and things and the fittest and surviving of the individual system depends on the coherence between its actions and the characteristics of the environment and things. In the case of 4th Space cyberreality, the "coherence" between actions and the environment, due to its fundamental informational and relational nature, becomes fluid. The plasticity of virtual environment and things will make the Self more fluid and less stable because the relation between one's actions and the environment characteristics is less stable. The required felt constraint to adjust one's action to reality is weakened. From here, the increase freedom and diversity for self-poiesis of personal self and identity within the 4th Space.

Luciano Floridi (2011) makes an interesting "theory transfer" of autopoietic systems concept into the philosophy of information that is extremely illustrative for understanding the particularity of the genesis of the Self within the 4th Space as informational and communicative environment. In his theory of the Relational-self, he identifies a unique mechanism of encapsulation, detachment and internal auto-organization at all three levels of

progression of life, i.e. from corporeal, through cognitive, to the conscious-ness as a progressive process of virtualisation. Any auto-organizing system develops a membrane for protecting its structural integrity against the sur-rounding environment. The conscious personal identity is triune (three-leveled) entity. The *corporeal membrane* or physical membrane functions as a hardwired boundary between the inside (body) and the outside (the environment). The *cognitive membrane* is a semi-hardwired (configurable) boundary between the cognitive system and its environment (body becom-ing an interface) that further isolates and controls the organism from its surroundings, using data processing and communication for maintaining the integrity of the organism. *The consciousness membrane* is a soft-wired (programmable) boundary between self, conscious mind or I (inside) and body (outside environment). The homeostasis at each of the three levels implies different types of bonds and orientations: physical stability of the living system is based on chemical bonds and orientations, the integrity of internal data within the system is assured by mutual information, that is the (measure of) the interdependence of data, and their codification in memory, and language, while the self-programing within the cognitive system is pro-vided by semantics. "The self emerges as a break with nature, not as a super connection with it" (Floridi, 2011, p. 560). The virtualization of the struc-tures of the Self imply increasing autonomy up to the world of meanings and interpretations. This cannot be realized individually, but only in common through language, culture and social interactions. Floridi's account high-lights the inherently free relational Self and not as the traditional metaphys-ical conceptions, only the rational disembodied self. The onlife in the 4th Space reflects accurately this situation. However, this perspective misses two important questions: the required compatibility between semantic ele-ments and reality and the psychological aspects of the Self's formation, which is not only an informational system. It only moves the question of compatibility between individual cognitive structures, which interprets the physical processes and states, to the collective level of the viability of cultur-al semantic tools.

Niklas Luhmann's (1988) theory transfer of autopoietic systems on social systems theory can fill this gap. Its perspective is also extremely relevant for Self formation within the 4th Space framework because the intimacy be-tween Self formation and the nature of the 4th Space is simply striking. The social systems are also self-organizing and self-reproducing systems, unlike the physical environment, hence they are exclusively communications and not ensembles of individuals, roles, acts, and/or interactions between them. (For the validity and utility of such theory transfer see Cadenas, Arnold, 2015). The transdisciplinary applicability of the theory of autopoietic systems moves the key element on the self-referentiality of the autopoietic systems. Autopoietic organization of the social system is built on communi-

cation, while psychic autopoietic system on consciousness as modes of meaning-based reproduction.

IDENTITY IN THE 4TH SPACE

The complexity of modern environment and cultural settings in which people are living challenges the consistency and substantiality of personal identity. In simpler societies of the past, the unity and coherence of personal identity, and hence personal morality, was ensured by relatively homogenous living conditions, shared moral norms, knowledge, ideology, religious beliefs and uniform conduct of the others from the same society. In modern societies, the individual is exposed, from its infancy, to a lot of heterogeneous practices, various ways of conduct, conceptions, knowledge, values and so forth. This miscellaneous cultural and social environment diminishes the relevance and ability of the external social environment to support the consistency and substantiality of personal identity. As consequence, nowadays "a person's identity is not to be found in behavior, nor—important though this is—in the reactions of others, but in the capacity to keep a particular narrative going" (Giddens, 1991, p. 54). This "internalized integrative narrations of the personal past, present, and future" provides unity, purpose and meaning in one's life (McAdams, 1996).

In the 4th Space, the difference between virtual and real stimuli, semantics and representations becomes blurred and shattered. The stable, rigid and, steady framework for separating or cutting across a single structure by over-signifying breaks becomes impossible. The meaning, interpretations, hermeneutics of real and reality, of relations and interactions become malleable and flexible. The narrative path of self-identity can be changed, transformed, reinitiated, converted, resignified from the beginning with materials and experiences borrowed from physical reality and face-to-face interactions or from virtual, mediated ones from virtual and extended reality. Nothing more auspicious for the growth of rhizomatous autopoietic Self. "A rhizome may be broken, shattered at a given spot, but it will start up again on one of its old lines, or on new lines" (Deleuze, Guattari, 2005, p. 9).

In the 4th Space, personal identity, in general, and its core characteristics, moral identity, in particular, grow into a rhizomatous interaction of private space values and moral, professional space values, public space values, digital (augmented) space values. Living in a continuously shifting and mixed virtual-physical place entails a completely resignification of fundamental values in general, and the professional and public values in particular.

"The distinction between public and private will probably need to be reconceptualised, because frameworks based on physical boundaries (the ever per-

vasive analogy of trespassing) and possession (the equally pervasive analogies of ownership and theft) are outdated conceptual modules, insofar as they are linked to a modern or 'Newtonian' metaphysics based on inert things and mechanical interactions." (Floridi, 2015, p. 22)

At the same time, personal identity is based on self-narration that is based, it its turn, on memory. The neurophysiology of memory already confirmed the different neurological and cognitive mechanisms of long-term memory and short-term memory (Norris, 2017; Nee, Berman, Moore, Jonides, 2008). The personal identity is related to long-term memory, but ceaselessly mediated by short-term memory, which processes the information prior to be stored in long-term memory each and every time when it is consciously and unconsciously accessed. Identity is therefore fostered by the permanent interactions between the continuously interpretations of experience, which is constantly processed in short-term memory, and the fixed conceptual and identity arrangements treasured in the long-term memory. The long-term memory offers the core basis for personal identity, but all the images, concepts, memories, autobiographic episodes, states, ideals values stored are incessantly slightly changed, eroded, transformed, and molded by the permanent working memory in daily experience, like tide's waves imperceptible change in time the shoreline. Their working mechanisms are quite dissimilar.

"The difference between them is not simply quantitative: short-term memory is of the rhizome or diagram type, and long-term memory is arborescent and centralized (imprint, engram, tracing, or photograph). Short-term memory is in no way subject to a law of contiguity or immediacy to its object; it can act at a distance, come or return a long time after, but always under conditions of discontinuity, rupture, and multiplicity." (Deleuze, Guattari, 2005, p. 16)

The personal experiences are also processed by employing the concepts and information from long-term memory.

"Short-term memory includes forgetting as a process; it merges not with the instant but instead with the nervous, temporal, and collective rhizome. Long-term memory (family, race, society, or civilization) traces and translates, but what it translates continues to act in it, from a distance, offbeat, in an 'untimely' way, not instantaneously." (Deleuze, Guattari, 2005, p. 16)

Living onlife in the 4th Space implies a significant increase in the short-term memory role for personal identity. The prevalence of the iconic increases the importance of sensory memory for constructing the self-image. The individual is exposed too more and diverse relevant models, values, and experiences. The personal identity seashore is more deeply and relentlessly changed by the broken waters (Camina, Güell, 2017).

The organization of the 4th Space, as open and self-created communicational and informational space, provides a different type of knowledge accumulation and progress. In Eco's (2014)metaphors, its rhizomatous structure "encyclopedically" constructs information, by *mapping* knowledge as a network of interlinked relationships, and not as dictionary, as a closed system of semantic and informational *trancing*. The fixed and absolute knowledge is lost, in the favor of freedom to pursue and develop an infinity of new connections and meanings. So, the search for origin and reconstruction of some linear development becomes less relevant for the personal identity's self-narrative. The substantiated multiplicity of personal identity's bricks reveals a plural origin, heterogeneous incentives and a variety of sources, sometimes contradictory, segmented, with suddenly broken paths of development, reinitiated and re-signified. "Within the rhizome, thinking means feeling one's way, in other words, by *conjecture*." (Eco, 2014, p. 55)

Self-identity can be more free and reflexive than ever. People have access to information that allows them to shape their personal identity in unimaginable and various ways, to reflect on the causes and intended and unintended consequences of their own action and especially to have many cultural alternative and axiological frameworks for interpreting their behavior. Out of this liberation from the stable, structured model of personal identity comes also its curse. This freedom to choose who we are and how we understand ourselves and our own conduct is practically equivalent with the condemnation for full responsibility on our deeds, as Jean-Paul Sartre (1943) remarked. And this is an anguishing task for anyone. Moreover, the increasing capability for individual self-poiesis is threatened by the dispersion of the sense of self in the multiplicity of interpretation. The peril of losing the human wisdom in knowledge and knowledge in information, envisaged by T. S. Eliot (1934).

THE MORALITY IN THE 4th SPACE

The emergence of the 4th Space reveals the importance of "ethical infrastructure" or infraethics "as a first-order framework of implicit expectations, attitudes, and practices that *can* facilitate and promote morally good decisions and actions. Examples include trust, respect, reliability, privacy, transparency, freedom of expression, openness, fair competition, and so forth" (Floridi, 2017; Floridi, 2012, pp. 738–739). I will not discuss here Floridi's (2017) list of "inframoral" entities neither in its completeness (why, for example, the belief is not listed among first in importance?), nor as a possibility of existence, even theoretical, at the collective level of a society made up of less moral individuals. If what it is called the "infraethical" structure can be made possible by the average moral level of its bearers. For

me, at least some elements are, in fact, parts of an "ultraethics" of that society, i.e. the networking ethical aggregate of myriads of micro-moral relations. For our subject it is significant how the ICT designed society affects, what Floridi call the "infraethics" of a given society.

In the 4th Space world, trust, reliability, transparency etc. become distributed between multi-agent systems (Wooldridge, 2009). People must put their trust not only on other people, but also on artificial systems, software, programs, and multiagent (human and artificial altogether) systems. Because the later are more predictable, do not have agency, occult interests or being considered objective experts, they become to be considered, sometimes, more reliable than living fellows. As long as the people's actions, existence, decision-making are increasingly intertwined in long chains of dependence on ITC infrastructure and program designs, networks of coworkers, multi-agent systems and intelligent systems expertise the moral agency diffuses in a *distributed morality* (Floridi, 2012). Ethical agency-assigning, accounting and assuming ethical responsibility for agents—becomes abstruse in the process of melting frames of physical, artificial, legal, psychological, public and private spatial borders within the 4th Space.

At the same time, the dispersion of responsibility (similar with the well-known phenomenon of diffusion of responsibility (APA, n.d.) is very likely to become more common and prevailing within the 4th Space. Here, all aspects endorsing the diffusion of responsibility are amplified. *Anonymity* is more prevalent in the 4th Space, even only under its subjective, if not objective, sense of it (Postmes, Spears, Sakhel, de Groot, 2001). People are in a paradoxical state within the 4th Space. They are simultaneously interconnected with many others more than ever, but they are also atomized because of the computer mediated relations with the others. Such situation increases additionally the diffusion of responsibility brought by the *division of labor*. Being more individualized as ever in working on their tasks, people can lose the general sight of organizations as a whole, that they are part of a general syncretic-synchronic system, and limit themselves to narrow tasks assigned for them (Baumeister, 2015). The differing and conflicting types of *expertise*, human versus artificial systems, and the failure to capture important information diminish the level of responsibility and accountability for personal deeds and contributions felt by individuals (Wegner, 1986). Not to mention the *group size*, indefinitely in the 4th Space settings, that is indicated as one of the key factors for decreasing the sense of individual responsibility (Latané, Nida, 1981; Rowan, Kan, Frick, Cauffman, 2021).

The pervasive infrastructure of AI system supporting the 4th Space contributes to this phenomenon of distributed morality that is the "macroscopic and growing phenomenon of global moral actions and non-individual responsibilities, resulting from the 'invisible hand' of systemic interactions among multiagent systems (comprising several agents, not all necessarily

human) at a local level" (Floridi, Sanders, 2004). The sense of responsibility is easily weakened in such "moral crumple zone" (Elish, 2019), where the consequences of the actions of a human actor depends on the behavior of an automated or autonomous system on which he/she has a limited control.

The hybrid onlife living can also have very perverse affects due to the impossibility of mind and body to differentiate virtual experiences from real ones. A person can live as a virtual avatar through fulfilling his/her unsatisfied needs, expressing his/her darkest desires and thus liberating himself/herself from its frustrations. At same time, it can do this dissociated from the responsibility of his/her own deeds, because can create the world's rules and norms. "Rather than simply being influenced by technological features, users have intentional and purposeful control over VR stories" (Shin, 2018). The 4th Space may be the ultimate games of reality where people can do what they want with less or without the fear of consequences. It is hard to believe that moral mechanisms, fostered in thousands of hundreds of years of evolution, can act efficiently as a control mechanism, as long as their basic affective triggers are worn and diminished by the lack of physical interactions.

From here the need for large scale, innovative and open-minded prospective psychology researches. The time variable and real "virtuality" (sic!) is essential for understanding the effects of living in virtual reality. Evidence from short-term and particular aspects in laboratory settings seems to entail a more optimistic perspective on application of VR as ultimately "emphatic machine". In my view, the results are more "wishful conclusions" on the potential and local effects of therapeutically interventions using VR, while the many ethical concerns regarding its legitimacy are overwhelming (Rueda, Lara, 2020). The ecological validity of this knowledge on VR in general and effects of the prolonged and substantial life in virtual reality is very questionable (Ventura, Badenes-Ribera, Herrero, Cebolla, Galiana, Baños, 2020). On the contrary, the moral mechanisms of the human psychology have limited power even in the physical and face-to-face relations. So it is dubitable that their functioning in cyber reality will be efficient. The 4th Space relationship can have both a detrimental effect on empathy, one of the key component of moral psychology, and augmenting one or many of the dark personality traits (Kircaburun, Griffiths, 2018). The lack of physical interactions diminishes the triggers of prosocial affective mechanisms, as affective and compassionate empathy. The hybrid physical-virtual reality of the 4th Space and augmented reality settings disturb the natural mechanism of accountability and agency. "In the physical embodied world, we have no choice but to assume responsibility for our body actions. [...] The possibilities inherent in virtuality, on the other hand, may provide some people with the excuse for irresponsibility" (Turkle, 2011, p. 254). The shocking sexual assault and verbal harassment experience of the psychotherapist who con-

ducts a research on the Metaverse (Patel, 2021) is a very worrying warning about the inadequacy of moral psychology mechanisms for the life in a 4th Space reality and the perils of how dystopic virtual reality can be.

The enmeshing of what is artifactual and of what is natural, of what is psychological and virtual, blurs the distinction between reality and virtuality, between human, machine and nature. Yet, the borders of reality itself, conceptualization, normativity, identity, and relationships fade and change (with the increasing of the virtual resources in relation to the material resources). Consequently, people are challenged to manage multiple identities, including the moral ones. In a substantially digitalized society, there is place for playing, even simultaneously, several different social roles, which implies diverse sets of interchanging different moral identities. This is why the modern endeavors to decode the moral mechanisms and moral identity within the mainstream of the cognitive psychology are miss oriented.

As I have showed, the changes detected in the formation of personal identity and behavior, resulting from our moral identity/identities are facilitated both by our own rhizomatous Self and by the "rhizomality" of the contemporary (digital) social space where the virtual environment is contributing to and influencing our identity/identities and consequently our moral identity/identities. The "rhizomality" can rapidly lead to transgression, as the virtual reality is a rhizomatous space providing a possibility of multidimensional, multileveled and multipolar transgression of moral norms for any individual immersed. Why is transgression made more likely?

The rhizomatous formation of the self has freedom of plasticity and can be changed and transformed in continuous experience of the real which also is dual-sided: real and virtual. The identity became map-like, rather than trace-like.

> "What distinguishes the map from the tracing is that it is entirely oriented toward an experimentation in contact with the real. The map does not reproduce an unconscious closed in upon itself; it constructs the unconscious. [...] The map is open and connectable in all of its dimensions; it is detachable, reversible, susceptible to constant modification. It can be torn, reversed, adapted to any kind of mounting, reworked by an individual, group, or social formation." (Deleuze, Guattari, 2005, p. 12)

Being map-like the ISelf identity is more like a continuous performance rather than a more stable structure of "competence". For moral Self perspective, this implies a diminished power down to disappearance of fixed and stable deontological principles of conduct. Similarly, the utilitarian rules of decision making are too complex to be constantly followed in daily interactions. The only viable base for moral behavior remains the virtue ethics. But the virtues are attributes of character based on constant performance. It requires a very elevated and comprehensive framework for incessant ac-

commodation the personal experience in the flexible moral matrix without corrupting it. Such framework should be also collective widespread and this can be made only by a valid and trustful social institution as Science, in particular, Psychology. But the required characterological research and education implies psychodynamics, self-reflexivity and humanistic perspective. It is unfitted for stark quantitative description and, therefore, is marginalized from current mainstream psychology. This is a significant argument for a "real" revolutionary change in its paradigm (O'Donohue, Ferguson, Naugle, 2003).

However, the happy and optimistic 4th Space communality can have even a darker evolutionary path. The particular characteristics of overcrowding, abuse of virtual interactions, lack of privacy of the cyberspace environment are similar to those found at the basis of "behavioral sink" that can lead to the development of a pathological aggregation or a pathological togetherness of the inhabitants (Calhoun, 1962, p. 295). More than that—as Edmund Ramsden explains, referring to sociologist Louis Wirth—incessant aggression, frustration, interference and conflict that finally lead to "depleted social relations, personal grief and personality disorders" are consequences of an overload of social interaction. Moral decay results "not from density, but from excessive social interaction" (cf. Garnett, 2008). The 4th cyberspace co-living, with erased borders between public and private, between shared and intimacy is prone to augment sorts of similar situation.

Not to mention that I did not take into account the systemic detrimental effects resulting from economic interest and political manipulation that erode the moral stability of any given society. On the contrary, the effects of economic stark interests with its associate mentality, affecting the cohesion of society and mechanisms of power are expected to be greater within the 4th cyberspace than in the physical face-to-face society where the evolutionary acquired affective mechanism regulating moral behavior is still powerful.

It is known the increasing shift in importance from the power as physical force and material possession to power as knowledge and valid information. And that is especially important for understanding the "genealogy" of moral identity and morals. The essential nature of interconnectedness which characterizes the 4th Space makes the relational nature of power more salient and makes possible its ubiquitous presence in social networks in the highest degree. People do not poses rather that they are fostered by this power networks, which emerge from the milliard of interactions between people and people and technology (Foucault, 2006).

Education for living in the 4th Space

Education for new (prospective) onlife ethics becomes first priority for the stability and sustainability of future society. The non-formal or formal education for science, moral-democratic competence (Lind, 2019), critical

thinking (Fasko, 1994) and for creativity and innovation support and multi-
ply the perspectives on what is or is not a good, right, moral, enhancing our
moral identity. These are the privileged cultural spaces where the desirable
changes in the moral identity can take place. They stand as flexible reasona-
ble milestones for the inevitable multiplying transgressive acts of the refusal
to obey any given conditions, since the very existence of the bounda-
ry/boundaries of what is moral presupposes their violation and since reality
itself became more a possibility than an actuality. A better understanding of
these processes will allow universities, schools, and educational policies
makers to adapt their curricula and practices, in order to fit the challenges
of the digital age. "ICTs have made possible unprecedented phenomena in
the construction of the self. Self-poiesis today means tinkering with the self,
with still unknown and largely unassessed risks and rewards" (Floridi, 2011,
p. 565). And, taking into account the rapid pace and extended technological
progress, this is only the beginning. "Unfortunately, as if this were not al-
ready a gigantic task, it needs to be paralleled by the development of an
equally robust ethics of self-poiesis, a new ecology of the self fully adequate
to meet the demands of a healthy life spent in the infosphere" (ibidem). In
the beast case, the educational polices are focusing now on the methods and
forms of how to deliver the knowledge to digital natives, when the chief
question is "what kind of knowledge will be required and expected when
living onlife" (Floridi, 2015, p. 22).

In order to foresee and provide the suitable education, firstly the cultural
base for understanding this brave new technological world must be
enhanced. Science itself must be transformed from the handmaiden of tech-
nological progress into an enlightened system of understanding. The
foolishly hiding behind the principle of objective knowledge doesn't work in
this domain of technological progress where science makes reality, not dis-
covers it.

"FUTUROLOGICAL" RESEARCH DIRECTIONS

Being a social and informational autopoietic system, the 4th Space is also
a meta-communicational system that can communicate about its own com-
munications and to choose its new communications. As Geyer (2001) ob-
served, the autopoiesis way of action has major consequences on the epis-
temology of these social, communicational or informational systems. While
the autopoiesis and observation are distinct, the observing systems, episte-
mological framework for study, is also autopoietic, and thus subject to the
same condition. They are reconstruct and self-modifies in the very act of
observing the autopoietic system. This is an impossible conundrum for the
classical logic of current epistemology, which cannot consistently accommo-

date both fundamental distinctions between autopoiesis and observation, and between external and internal (self-)observation. In any autopoietic system (social, communicational, informational) "all observations are by definition self-observations" (Geyer, 2001).

The current mainstream of scientific and philosophical enquiry on reality, i.e. cognitive sciences and analytic philosophy, is of little use, also because it misses the phenomenological aspect of the identity formation that is based on the dialectics between reality and actuality. The epistemological and academic success of these approaches is deceptive as long as they are tailored on and by the structure of cyber-reality: technological advancement, computer science, and neurophysiology. The current mainstream of psychology (cognitivism) and philosophy (analytical philosophy) are mostly tools for developing more ameliorated cyberspace for onlife living and to pave the way for a general rational (and algorithmic) cyborg intelligence. Without a humanistic perspective, psychology and philosophy become the *ancilla* of AI. Their answers and perspectives are limited to and molded after the technological and AI Weltanschauung. The human phenomenology and conscious experience are beyond their reach, together with deeper questions left unanswered by them, simply because these are beyond their legitimate horizon of interrogation. Human consciousness is a self-regulated, autopoietic informational system with characteristic semantics and states irreducible to physical substratum. The techno-naturalization of contemporary scientific paradigm can miss the essence of humanness. But this is still a small peril. The big peril is that, as the main paradigm for understanding the human being, they can have detrimental effect on its humanity. Humans can cease to see themselves "humanly" and to conceive themselves as "human" anymore. The use of cerebral implants has big chances to lead to erasing any border between what is human and what is artificial (Fukuyama, 2003). At this point the debate about naturalistic fallacy and fallacy of naturalistic fallacy become extremely relevant.

It is important to include in the mainstream psychological paradigm new methods and new theoretical models able to incorporate rhizome-like structure of the personal identity. It is a difficult task as a long as the modern cognitive science is relaying and feels relaxed on the linear algorithmic and statistical procedures. But the "rhizomality" and transgression must be incorporated in the theoretical model not as statistical noise, but as systemic factors contributing to the transformation of moral identity/moral identities of nowadays person(s) in increasingly digitized contemporary societies. It also aims to find and promote the best ways and tools for design and control those moral identities using educational strategies and tools.

In addition, the humanistic education among the scientists and engineers of the 4th Space is desperately required. The common core and ultimate outcome of the humanities are intrinsically the advancement and deepening

the self-knowledge of the felt experience of the world. Scientific and techno-logical endeavors are positivistic in their nature and construct an alien, de-tached, and impersonal world. A humanistic thread is essential to entrench the technical and scientific edifice for the making the 4th Space psychologi-cally inhabitable. The ultimate value of the humanities is the promotion of in-depth and multidimensional self-knowledge. While, as Socrates said, an unexamined life is not worth living, it is also important *how* it is examined. The scientific paradigm is unable to provide this, as long as it excludes the phenomenological approach, humanistic perspective and rhizomatous con-cept. There are some paths for prospective studies required for circumscrib-ing the complex subject of moral identity development in the 4th Space and for adapting the current epistemology to this peculiar topic:

— study of rhizomality and transgressiveness of the moral identi-ty/identities in our increasingly artifactualized/digitalised societies and their impact on the resilience and transformations of our worldviews and (moral) values: responsibility, trust, transparency, freedom, creativity;

— analysis of the possibility (opportunities and limitations) to create and secure spaces for free, critical, lucid and creative thoughts in (over)digitized societies;

— evaluation and assessment of breakthrough and major (digital) tech-nologies and their (global and/or existential) risks in the core of societies and individual lives as risks for the future(s);

— critique of the researches, tendencies and approaches diminishing the necessity, importance and role of the humanities aggregate as well as intelli-gent education in critically reflecting on and actively participating in collab-orative—networks and communities building;

— study of how digitalization is altering both (moral) identity and social life through the rhizomality and transgressiveness of social relations/networks in the virtual societies;

— analysis of the effects the digitalization on the very understanding of time and space/place, as affecting our moral identity/identities;

— evaluation/assessing of digitalization affecting not just the production of data, but also its accessibility and use: the very nature of the production of knowledge and its use and sharing;

— critique of the unreflective and abusive use of AI and data mining and their effects both in research and in the education for science, moral-democratic competence, critical thinking and for creativity and innovation.

OPEN CONCLUSIONS

The conception of this very article illustrates the pervasiveness, subtlety and utility of rhizomality as an epistemological concept for understanding the nature of the 4th Space and its semantical structure.

The moral and ethical challenges raised by technological development and the 4th Space onlife living are bigger and more complex than ever. Moral identity and morality are artifacts, products, results of our activity and cannot be anymore considered simply natural and unchangeable field(s). Such a perspective bolds asymptotically the responsibility of every human being and every society when accepting, using and promoting some of the technological changes and challenges specific for a digitized society. It also urges for the search and implementation of the best ways and methods for increasing the quality of non-formal and formal education for science, moral-democratic competence, critical thinking and for creativity at all the ages of an individual's life.

The awareness of the development of information technologies and understanding the impact they have on society will lead to a change in the concepts of the world and life in communities. Younger generations need tools for training for a constantly changing the world, with leaps in various spheres of life (economics, health, political management, education) and to train correct information skills on news in the fields of science, in order to find ways to implement them in community life. As the 4th Space and future society is continuously on the making and the human powers to foster its destiny and living environment are tremendous the risks are as high as the advantages, and will depend solely on us if we have a utopic or dystopic 4th Space for our place in the world.

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