THE ETHNOMATHEMATICS POSTURE AS A POLITICAL BLOW: UNVEILING THE MYSTICISM OF FIVE RHYTHMS PRESENT IN COMMUNITARIAN MATHEMATICS EDUCATION

A POSTURA ETNOMATEMÁTICA COMO UM SOPRO POLÍTICO: REVELANDO O MISTICISMO DOS CINCO RITMOS PRESENTES NA EDUCAÇÃO MATEMÁTICA COMUNITÁRIA

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ABSTRACT

In a dialectical movement, the very mysticism that operates the existing educational processes has been treated with deep mysticism in the academy. The paths that unravel this mysticism have been avoided, or even denied, both as an alibi that questions the scientific credibility of the study and as a discourse that rescues knowledge unworthy to human progress and success. To demystify, this essay presents an analysis on some research processes developed with *multi-marginalized* communities. The analysis begins with an overview of the bottom-up processes of human development in Europe, and opens up to research experiences both in Portugal and in Brazil, by supporting the establishment of a methodological theoretical structure that is transversal to these research experiences. An ethnomathematics posture rooted in critical ethnographic movements, and developed with a bottom-up research, promotes not only the possibility of breaking with the mysticism surrounding inter and intra-communitarian processes but also of witnessing the dance of communitarian bodies to the beat of five rhythms: cultural identity, self-governing, corporification, identification, and multicultural racism. These rhythms have revealed themselves as pivotal concepts in the development of communitarian mathematics education, and are here discussed in terms of transformation, emancipation, and civility that are objectified and conquered by means of this research, going beyond the hyper-valuation of the identity of micro-communitarism.

Keywords: Ethnomathematics Posture; Communitarian Mathematics Education; Local Knowledge; Urban Boundaries, Human Topology.

RESUMO

Em um movimento dialético, o próprio misticismo que opera os processos educacionais vigentes tem sido um assunto tratado com profundo misticismo na academia. Caminhos que desvendam este misticismo têm sido evitados, ou até mesmo negados, tanto com o álibi de colocarem em causa a credibilidade científica do estudo quanto com o discurso de resgatarem conhecimentos que de nada valem para o progresso e sucesso do ser humano. Neste sentido de desmistificação, este ensaio apresenta uma análise sobre alguns processos de investigação realizados com comunidades *multimarginalizadas*. Esta análise inicia-se por uma rápida visão dos processos *bottom-up* do desenvolvimento humano na Europa e abre-se às experiências investigativas, tanto em

território lusitano quanto em território brasileiro, aflorando a constituição de uma estrutura teórico-metodológica transversal a todas estas investigações. A postura etnomatemática alicerçada no movimento etnográfico crítico, e desenvolvida nestas investigações bottom-up, promoveu tanto a possibilidade de romper com o misticismo em torno dos processos inter e intracomunitários quanto de presenciar uma dança dos corpos comunitários seguindo cinco ritmos: a identidade cultural, a auto-governação, a corporificação, a identificação e o racismo multicultural. Estes ritmos revelaram-se como conceitos primordiais no desenvolvimento da educação matemática comunitária, e são aqui discutidos em termos da transformação, emancipação e civilidade (Balibar, 2011) objetivada e conquistada por meio destas investigações, indo para além da sobrevalorização da identidade do micro-comunitarismo.

Palavras-chave: Postura Etnomatemática; Educação Matemática Comunitária; Conhecimento Local; Fronteiras Urbanas; Topologia Humana.

1. Introduction

Nowadays, the dichotomy between democracy and citizenship at the European level has been supported by its own diversity. Challenging all Marxist logic, the *Treaty of Maastricht* (European Union, 1992) proposed the establishment of a political unification via a common economic system. However, the contradictions among economic issues and nations, social groups, political classes, and popular classes have spoken louder. According to Balibar (2011), "the current debates are haunted by the search for a paradigm in which cultural pluralism will no longer be residual or subordinate, but constitutive" (p. 107). In this sense, emergent movements to think about political outputs centred on the diversity, on the autonomy, as well as on the rescue of the dignity of the survival, have been developed in Europe.

Nowadays, emerging movements can be recognized by a common structure: small scale, originated from a critical participatory action, intercultural, fomented by independent thinkers, aiming for autonomy and empowerment of the local community and of its members, and working without collaboration with the local political apparatus. These local communities are the *part of non-part* (Rancière, 1995) of the European social body. The term *local* is a way to let and explain how these communities have been geographically confined, by living in intellectual, cultural, economic, environmental, and political exclusion – multi-marginalized communities. From macro to micro movements, all of these emerging movements have their roots in different forms of oppression lived in its local space, and the related works around issues of the concepts of their own space.

Syriza – Coalition of the Radical Left in Greece can be pointed out as one important example in the macro movement. In a proportional relation, its political space is Europe and, in this case, this movement in Greece has become a small part of the whole. The Urban Boundaries movement – a critical ethnographical (Thomas, 1993) movement focused on developing an emancipatory education policy through participant observation of knowledge present in multicultural communities, can be pointed out as an example in a micro movement. This movement, which is the starting point of the argument presented here, has its own emerging political space in the small city of Costa de Caparica, on the edge of Lisbon.

From these macro or micro emerging movements, different actions were born. In the case of the Urban Boundaries movement (Urban Boundaries Project, 2010), an academic project was born – which was supported by the *Fundação para a Ciência e a Tecnologia* (National Science Foundation of Portugal). As mentioned before these actions have, as a common characteristic, a bottom-up process, and this academic project, differently from others, was partly constituted by the members of Urban Boundaries movement: academic researchers, local fishermen, and members of the *bairro*, which is a local multicultural settlement. The central point of this project was to collectively create tools that eliminate the invisibility of local people's life, and promote the empowerment of local people. In the case of the fishing community, they have a restrictive condition on access to water for fish to survive (Mesquita, 2014). In the case of *bairro*, an urban settlement, they have no access to water in their homes and not a water point near them, having to walk more than one kilometre to, in the city centre, fill a bucket of water to survive. Both communities have no participation in local political decision-making.

The Urban Boundaries Project emerged, dialogically, from the local problems of oppression through collective analysis of local issues around intellectual, cultural, economic, environmental, and political exclusions experienced by the local populations. Its central goal was to develop a critical emancipation of the local communities. Based on Paulo Freire's Popular Education (1987) and on Ubiratan D'Ambrosio's Ethnomathematics Program (1999), this project promoted the development of local communitarian education including the development of local communitarian mathematics education (Mesquita et al., 2014).

Critical Alphabetization, Multiple Cartography, and Histories of Life were the three tasks of this project (Mesquita et al., 2014), in which different competences were developed through the implementation of the Trivium Curriculum (D'Ambrosio, 1999) as a critical tool to understand the local communitarian education. These tasks were constructed as the whole project: by three hands, representing, in an academic way, the local needs, possibilities, and desires (Mesquita, 2014). The central point here, in this chapter, is to share the possibility of developing educational research that meets the local needs (considering the local desires and possibilities). This project was possible because it was rooted in a micro movement based in different forms of oppression found along the Costa de Caparica region in both communities, especially concerning conditional access to water.

As argued in Mesquita (2016), other emerging micro movements promoted research of local communitarian (mathematics) education through an ethnomathematics posture (Mesquita, 2008). All of these emerging movements are connected not only by an ethnomathematics posture, but also by a common methodological-theoretical root. However, they were disconnected from their cultural contexts, presenting in their societal backgrounds different cultural groups such as (1) street children, (2) inner city and (3) urban indigenous people, (4) multicultural urban slum - *bairro*, and (5) a fishing community. It is relevant here for us to clarify that such postures aim at the empowerment of local people, searching the emancipation of local communities through the commitment of such communities in the collective construction of their own concepts of space and, consequently, in their participation in local decision-making.

This posture also urges for new interpretations of mathematical language by the *disalienation* of the space (Santos, 1975; Harvey, 1996).

D'Ambrosio (1999) proposes, through the ethnomathematics program, a change of paradigm in mathematical western views, when he invited us to rethink our own spaces; that is spaces, where we are acting as social and natural beings, and reminding us of our kinship with the Earth. This sense of interdependency is the core of ethnomathematics discourse and it promotes not only the creation of possibilities of multiple solutions for one problem but also the development of the intellectual conditions under which such creations can take place. Therefore, D'Ambrosio unsettles traditional structures of mathematics and mathematics education when he proposes the re-embodying of mathematical discourse, not only for problem solving, but as a process that makes us conscious of issues of interdependency as inexorable in our educational system.

In a sociological analysis of mathematics, as Restivo (1993) proposes, all actions from these emergent movements reveal the existence of structural concepts to think about such political outputs centred on (1) Autonomy – considering our interdependency, (2) The diversity of current encounters – considering clashes, as well as (3) The rescue of the dignity of survival - reviving our kinship with the Earth. In the case of mathematics education, these concepts emerge from complex interconnectedness of their own communitarian (educational) actions and local mathematics concepts of social actors involved, as well as their re-contextualization of concepts of space.

Currently, human relations related to globalized educational processes dance to the same rhythms, which are supported by standardized and set assumptions according to the necessary political and economical hegemony of a globalized world. The lulling of this dance comes from our own needs, desires, and possibilities as a community, which human beings confront daily. The rhythms that compound this lulling need to be heard and understood to be questioned and, for it, they need a bar. In musical theory, the bar is a segment of time corresponding to a specific number of beats, which allows the performer or listener to organize the rhythm of a song by grouping the music notes (Randel, 2003). The bar communicates the composer's ideas for the human body to enable it to create a harmonic dance, critically felt by the human body. Following an analogous movement, the road built by an academic project supported by an ethnomathematics posture has been experienced as a way to open systems that encompass educational processes in musical measures - a critical view over a complex system involves these processes, allowing these five rhythms to be manifested and worked on by all social actors involved in the research.

Therefore, after the research experience in the Urban Boundaries Project, and, also in regard to researches with children in street situation, indigenous from forest, and indigenous from urban cities, a human topological central structure was developed through communitarian educational processes. It is important to highlight here that human topology is used under different knowledge areas, i.e. biology, technology, sociology, neurosciences, and so on. Here, human topology is understood from an ethnomathematics perspective, which takes on interdependence among all human beings and among all knowledge areas. It allows the study of these relations through the primary logic of human survival in communitarian spaces - the use of communicative, analytical, and material instruments. Each space, composed of human and knowledge interactions – which I identify as community, reveals a place with specific socially

constructed characteristics. The study of this place is a topology of the human relations – a human topology.

As such, some human topology properties (abstractions that characterize an object) were being revealed after some research experiences that studied the local communitarian education, as previously described. In these properties five rhythms were identified, regardless both the community where the research processes happened and the cultural group inserted in the research processes. Hitherto, the study of human topology has only been possible because an ethnomathematics posture was assumed in all research processes. This study, born from ontological images and actions that were experienced in different research fields, searches constantly for transdisciplinary/transcultural points of these images and actions.

Cultural Identity, Self-Governing, Corporification, Identification, and Multicultural Racism are the five rhythms that are discussed here in terms of (1) how they are experienced in contexts of the encounter with the other and the self. A special concern is the way they are promoted by the development of local communitarian mathematics education, (2) why they are in the root of the communitarian educational processes - in the current neoliberal system, (3) when and where they are identified, (4) for whom they were designed, and finally, (5) for where they are kept.

The basic characteristics of these five concepts were emphasized in two collective processes in the experienced research: while observing our own social mathematics practices, under the power of political issues – which were directly connected to the survival of the observers; and while collectively analysing and disseminating data from observed moments. In all of these research studies, the *study object* - the local people - those who were participating on the project, were researchers of their own practices. However, though occupying a naive position as researchers of their own practices, the high complexity of these concepts was felt in the invisible networks that exist within the local social practices of different local communities, as well as the global political and economic practices that circumscribe them.

2. Cultural Identity and Self-governing

D'Ambrosio (2001) argues that the human impulse to survive, which exists through the inevitable interactions of human beings with nature and other beings, creates an exchange of knowledge; and that human behaviour is a main interlocutor inside societies. Like music, different urban societies around the world have different rhythms and, at the same time, different ways of being, which are constructed according to many facts, such as: the prevailing model of urbanization and production, systems of communication, and the power structures that circulate within them. Sharing is a necessary action that must be taken in any society where knowledge (as languages, systems of explanation, myths, cooking, customs, music, etc.) are socially created, according the survival needs of that society.

Knowledge is in constant movement, being recreated by human beings to give support to the balance in that society. Knowledge is both a collective representation and serves as a category for selection inside of society. Compatibility and subordination are actions that are recognized in every society in order to understand the behaviours that are socially developed, according to its own often-unique rules and regulations – with their

own margins of flexibility. These behaviours are in constant movement, being recreated by intelligent lives to structure the movement of a given society. They serve as a collective representation and a model within each society. According to D'Ambrosio (2001), the actions *to share knowledge* and *to make behaviours compatible* are synthesized as characteristics of a culture. Cultures are in constant transformation, being influenced by the dynamics of the encounters through social incidents such as trade, politics, economics, and their own ongoing *knowledge processes* within each society.

The concept of culture appears intrinsic to society because the balance of society is the central object of this concept. To understand better how knowledge is shared and how behaviours are made compatible and subordinated, all experiences lived in the research field with different local communities sketched a complex view for these movements by looking at socioeconomic and historical contexts of cultural identities and at self-governing of these local communities. Cultural identity and self-governing are deeply connected by the complexity of their interrelations and intra-evolutions. Therefore, to talk about culture is to talk about the self; taking the self as a social structure. We can, as well, look to the self as an economic design, considering that the political and intellectual structures are founded in the current neoliberal system.

The history of human beings often focuses upon cultural aspects and have been dealt with in many academic, literary, and communitarian works. Restivo (1991) presents a critical historical view of the image of the self and discusses the self as a creator, an agent, and a product of society, of culture, and of sociocultural transformation. The author makes explicit that "some notion of 'self' is necessary to account for the individual's experience of unity and continuity in him or herself and others" (p. 99). The author also pointed to conceptions of the self that came before the emergence of social sciences and that range from metaphysical and theological ideas about the soul, to views of the human being as a collection of summative sensations. The social perspective about self could only arise at the moment when the enlightenment brought down dominant views of human nature.

In The Interpretation of Cultures and in The Question of Cultural Identity, Geertz (1989) and Hall (2001), respectively, demonstrate, also by a critical historical construction, that Enlightenment thinking had a uniform perspective on societies, where the essential centre of the self forms the identity of a human being. This identity originated with human beings and has remained essentially the same - continuous or identical - during his/her existence. Essentially, wide varieties in differences among human beings, in their beliefs and values, in their habits and institutions, both in time and from place to place, is without significance for the conception of human beings during this period – an individual, is totally centred, unified, gifted with capacities of reason, conscience, and action.

Between the humanistic renaissance of the 16th Century and the enlightenment of the eighteenth Century, the birth of this *individual sovereignty* represented an important rupture with the past. The emergence of this conception can be related to the decline of the medieval cultural order. Indeed, this movement can be considered as the main lever that pushed all aspects of the cultural system of modernity into movement and, as argued in the next point of this essay, has been claimed to rebirth in the current system.

The increasing complexity of the modern world and the consciousness that the essential centre of the self is neither autonomous nor auto-sufficient but in continuous dialogue with the outside the cultural world has brought forward a new conception of the human being. The identity of the human being was conceived as being formed through interaction between the self and other human beings that mediate values, senses, and the symbols found in the world that she/he inhabits. The interactionist school that began to explore the self from a cultural perspective founded these thoughts on introspective analysis of human beings and their mental processes in the late 19th Century.

Symbolic interactionists, who approach keystones of the new conception of the human being, have stressed this interactive conception of the identity and of the self. However, at the same time, they have retained the essential centre of the self - an interactive self - in the human being. Here, cultural factors are recognized as necessary for understanding the self and the self receives the status of a social structure. There is a unification and prediction so that the self and cultural worlds co-exist through identity, where identity becomes the basis of the human axis.

Restivo (1991) claims that the unity and structure of the self reflect the unity and structure of the world. The cultural world is never perfectly unified or structurally static, but varies with time and across geographical and sociocultural boundaries. Within this variation, what has happened to identity? In Hall's view (2001), identity becomes identities and these identities of human beings are sometimes contradictory and thus remain unresolved. The process of identification through which human beings project his or her cultural identity, starts to be provisional, variable, and problematic. At this point, the dependence of the self upon its social and cultural conditions begins to give out its first signals. According to Restivo (1991), Marx's observations on the alienation of workers and Weber's general concern with the alienating effects of rationality and bureaucracy were among the first signs.

The contribution of Durkheim's works to this discussion brings forward another strong perspective about human beings. According to Durkheim (1995), the social being is constructed by two beings that can only be separated in the abstract, and can never be truly distinct. One is constituted from all mental states that link only to ourselves, and the events of our life: what can be described as the *individual being*. The other is a system of ideas, of feelings, and of habits that are expressed in ourselves, not through our individual personality, but through the group or the different groups that we are made up from the inside: religious beliefs, beliefs and their moral practices, professional or national traditions, the collective opinions of one gender.

In the second half of the twentieth century, in which the theoretical movement of the decentralization of self culminates, part of the social scientific theorization[1] attempts to distinguish and to specify the social and the cultural concepts. The links between self, social, cultural, and sociocultural changes were in vogue, and the clarity of such concepts enables, according to Geertz (1989), understanding as much about the organization of social activities, their institutional forms, and the system of the ideas as the nature of the existence of relations among social activities. During this same period, the self assumes different identities in different moments and places, or more broadly, in

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[1]Parsons, Shils, Nadel, Leach, Rediefild, Lévi-Strauss, Firth, Singer are some of the social scientists that deal with this subject in different ways.

different spaces. It was considered that human beings had no fixed, essential, or permanent identity. According to Hall (2001), the identity is formed and transformed continuously in relation to forms in which he or she is represented or interpreted in the social and cultural surroundings. Identity is *historically* rather than *biologically* defined. Many factors could be considered relevant to the development of the human intelligibility. One of the most important factors related to this was shared by Althusser (1985), who pointed out that the works by Marx and Freud have modified the cultural worldview. Althusser's study was based on the rereading of Marx's work and in the rereading of Freud's work by Lacan. For him, the renewal that is present in their work is not about the discovery of a new study object, the class struggle and the unconscious, but in the discovery of the definition of an object, of its limits, and of its extension, of the characterization of its conditions, of its existential forms, and of its effects, of the formulation of requirements that it must carry in itself in order to understand it and act over it (the object). In other words, they conceive the process of knowledge as a modality of extraction of the praxis. Towards the end of the 20th Century, the social and the cultural values were shaken. The self appeared as a social and cultural construct in constant movement.

According to Restivo (1991), the self, in these terms, is fragile. He argues about this fragility using the concept of open systems. "Open systems are ideal systems, which do exchange energies across their boundaries. The social and cultural environments in which human beings are socialized - or programmed - determines the extent to which he or she will behave in ways that appear robot-like or in a ways that reflect independence and uniqueness" (Restivo, 1991, p. 104). In terms of open systems in the present, the main claim is to consider social and cultural spaces as a way to offer alternatives and encourage individual choices, which are bounded, in our neoliberal system, by (1) constrained cooperations, (2) labels of decency, and (3) in name of dignity.

The choices open systems promote are focused on the abolition of oppressive situations in urban environments, in which the urban human being is used as an instrument in violation of their own interests. In an open system, the self-governing is conceived of as the main way to make places that can be occupied by cultural identities, by the diversity of the urban cultural identities. However, self-governing at current times is limited by economically closed systems - by strategies of power and neoliberal ethics, and where the self is subservient to it.

An ethnomathematics posture claims, by a revolution in current processes of self-governing, the sharing of knowledge and the compatibility of behaviours. This posture, inside the research processes on communitarian mathematics education, works in favour of listening, seeing, feeling, participating, recognizing, and acting, and promotes the possibility of choosing a way to survive with dignity, instead of following the way that is imposed by the current political and economical hegemony globalized world. The self-governing passes thus to self-governing developed by communitarian collective agreements, by local and global understandings of invisible nets that circumscribe the local communities, and by disturbing communitarian choices.

As argued by Mesquita (2016), and insisting on the unveiling of one more naive package in the neoliberal system where the individual freedom of choice is a bold assumption in the face of the global hegemony of neoliberal systems that, cynically, provide us with the possibility to change our posture and to make choices. When the

ethnomathematics ethnographer is submerged in communitarian education research, she/he can realize, with the members of this community, how the possibility of choice is framed within preconditions that such choices do not deeply disturb the balance established by the dominant ideology. Hereby, the acts of different postures are *in the same bag* and form a form of bondage. The concept of choice is linked to the concept of freedom and it can be assumed as a *rationalized* blind position (Mesquita, 2015). According to Žižek (2001), we are living in the era of the *escape from freedom*, as we choose to refrain from selecting under the banner of an alleged rationality. To be free is then to be able to reason about the human being's closure and, accordingly, to create collective strategies to live in dignity. Disturbance is one strategy to re-gain such freedoms breaking from this blindness and courageously searching for empowerment.

Empowerment is one tool of freedom. The subject that does not have access to her/his validated knowledge, or have it validated by and with a minorities' group, is kept on the margins of society, with no conditions to live a self-governing life in dignity within the political and economic apparatus. A *local* community that does not celebrate this kind of collective knowledge will be confined to mere survival within the neoliberal system. As an exercise of the present economic apparatus, society assumes that local communities are to be centred in and defined at the local level. However, quite the contrary, these communities are often situated within society as a whole and they are disappearing, in the experienced research processes from the victimization position to the self-governing posture. Cultural identity has been maintained not as a position of ghetto, as the charm of social exclusion argued by Demo (1998), but in a language where the process of reconstruction of the local (mathematics) knowledge has been itself the mediator towards a transcultural community.

The research processes identified dialogues and cultural clashes that were created by the dominant systems of governance (Mesquita et al. 2011; Mesquita, 2014), making these clashes visible and unveiling the oppressions that were executed by externally imposed voices in local communities. Making visible these clashes has also enabled the communities to express their voice and thus, collectively, develop critical reasoning among all members involved in the research through an exercise of rethinking their own praxis. The extermination of a community begins with the act of silencing their voice and, consequently, their collective thought. The struggle for voice and for collective thought thus must produce disturbances. Disturbances provoke mechanisms of defence.

In the mechanisms of defence it is necessary to know; to know which ethics and which power are inserted into of the all agreements (top-down or bottom-up) that focus on the community, looking for their external faces and observing their effects, not by interrogating the internal motivations of social agents – what the supposition of the existence of a centre of power and of ethics would be and that both could be withheld by someone. Ethics and power appear as crucial articulators in the capacity of the human beings to decide by themselves.

3. *Corporification* and Identification

Power and ethics coexist within dynamic processes in the human development that are recognized as social practices; they permeate self-governing and the identities of human beings in encounter processes. These concepts have been thought about in different areas of knowledge and in different cultural places, and their multiple discussions have

taken many different directions. In this work, based on the earlier mentioned research emerging in micro movements, these concepts emerged as such research focused on interpretations of the relationships among mathematical knowledge, power, ethics, and body. The body, here, appears as another cultural character (a cultural actor) that is in constant socioeconomic movements and never exists as a complete and independent structure in and of itself. At the same time, both concepts, power and ethics, emerge from strategies of domination when they are experienced and where they produce effects through the body. These effects were evident when social actors in the project counted, measured, localized someone/thing or themselves, drew, played, and explained (categories worked by Bishop (1999) to explore mathematics activities in cultural different groups).

Disciplined bodies were observed in the research developed from emerging micro movements as obeying a dual social logic, totally interconnected, particularly (1) *corporification* - the place of the body, as advanced by Michel Foucault (1994), and (2) *identification* - the social formations and attitudes of the body, as advanced by Slavoj Žižek (1998). Foucault (1994) proposes an understanding of the development of the forces of production through an exposition of the types of power that are able to work in the forces of production. The *human body* is a force of production, which exists inside and through the political systems; the productive forces that give a certain space to the human being and at the same time invest it. In this regard, Foucault (1994) states that it is "a space that behaves itself, that adopts a particular posture, that fits in a certain way, and that continuously works" [2] (Foucault, 1994, p. 470).

An important element of power is to clean the city in those urban environments previously highlighted, and to put each one in its place (*every jack to his trade*) – hence people from marginalized communities, i.e. children in street situation, (urban and inner) indigenous, local fishermen, or members of multicultural urban slum, can survive but not live in these urban environments and are maintained in urban non-spaces (Mesquita, 2008). The urban non-space can be categorized as a space in which there is no action (following Žižek 2011b definition of act), even though people know about, transit, and construct it – a boundary urban space. The word "urban" appears to reinforce the transcultural movements as part of the political and economical hegemony due to the predominant logic from the large urban centres. The urban non-space is a central strategy of globalized hegemonic power.

Power occupies and delimits spaces, creates and discloses rules and patterns, looking to standardize the urban environments, using strategies to control the bodies, to watch them and, mainly, to exclude them by creating urban boundaries, such as places of segregation and exclusion. According to Foucault (2002), those boundaries, the visible spatial demarcations, classifications, and invisible organizations are strategies of power, they are reality experienced, and they are spaces of life. The space, or spaces, claim/s a decisive character within the relations of the human being, as affirmed by Santos (2006):

> (...) the role of the place is decisive. It is not only a living environment, but also a living space, that is, from experience renewed constantly, by allowing at the same time, the re-evaluation of the

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[2]"*un espace où se comporte, où adapter une posture particulière, où s'asseoir d'une certaine manière, où travailler continûment*" (Foucault, 1994, p. 470).

heritage and the quest about the present and the future. The existence on that space plays a revealing role on the world[3] (Santos, 2006, p. 114).

In that sense, the concept of corporification was developed to categorize the action that determines the place of the physical body (collective or individual), mind body (knowledge), or institutional body (juridical or political). The visible spatial demarcations of these bodies, the transformations of the new social relations in the spaces within which these bodies act and are classified, as well as the hierarchical order of the knowledge existent in these bodies were highlighted both in research on communitarian mathematics education with children in street situations and indigenous (inner and urban) people, as with the fishermen and members of the *bairro* community. These three bodies constitute the core that drives the performance of the rhythm of corporification, promoting and claiming its development.

The relation between power, mathematical knowledge, and body is linked to the process of *pleasant submission* where duty becomes pleasure – the dance of corporification. In the process of research, the ethnomathematics posture developed itself as an object act against the ingenuity of pleasure. The bottom-up exercise, which the ethnomathematics posture foments, unveils the ingenuity that is behind pleasure questioning the local strategies of power imposed in the own local communitarian mathematics education. This process of questioning, where the exercises focus on local communitarian mathematics education contexts, aims towards active, critical, and participatory societal progress, not necessarily technological or economic progress. Such societal progress is emergent and can create exercises of collective co-constructions, namely: (1) economic local analysis, (2) critical systematization of the national politics, (3) leaning about their own knowledge (as individual and as a local collective - community), and (4) critical process regarding their own political constitution inside the local community (and its ability to contribute to maintain or break with global strategies of power).

Perverse strategies of power developed under the neo-liberal system are mainly based on the rules and regulations behind the labels of welfare, following the social exclusion approach (Demo, 1998). According to Žižek (2011), these strategies are *food* for the postmodern identity of the rescue of major enlightenment causes, i.e. the continuous or the identical. In that sense, a global ethics is based on the welfare and identification exercises as constructed, securing actions in perverse strategies of power.

Slavoj Žižek has discussed, analysing the postmodern identity, welfare actions and the concept of identification. One focus of his analytical position is to explain the relationships that exist between the strategies of power in the top-down structures of current governance (the global market logic and the local non-politic) and, what I call, a global ethics. According to Žižek (1998), in a socially structured body where each part occupies its space, the existence of non-parts checkmates the natural functional order of the relations inside this social body. On one hand, the identification of a non-part within the whole, within the universal, as a part of society, displaces the social agency of the body as a place with a voice. This is an elementary gesture of politicization. On the

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[3](...) *o papel do lugar é determinante. Ele não apenas é um quadro de vida, mas um espaço vivido, isto é, de experiência sempre renovada, o que permite, ao mesmo tempo, a reavaliação das heranças e a indagação sobre o presente e o futuro. A existência naquele espaço exerce um papel revelador sobre o mundo* (Santos, 2006, p. 114).

other hand, the identification of non-parts within the particular, that is characteristic of the depoliticization process, cooperates to maintain the condition of being excluded.

Global ethics has at its core basic human rights as positioned within particular interests. In *Did somebody say totalitarianism? Five interpretations in the (mis)use of a notion?*, Žižek (2011) develops an apology for a *return to politics* by questioning the emergent normative of human rights as being the form in which it appears in its exact opposite. Žižek reminds us, in the construction of his analytical process and position of human rights: (1) the known and worn reiteration of the lack of universal rights, to the extent that these are historical creations, originating from a particular culture, (2) the usual systematic (systemic) violation of these fundamental rights, which undoubtedly exists, and, (3) his insistence on going against the (multi) cultural fashion of major Western centres, especially those that are the incubators of postmodern thought, that have come to defend with zeal and critical consciousness universal values of our own current enlightenment, and (4) the reasons for what human rights remains the object to such disbelief and ignorance for many of those who should be protecting them the most. Conditioned under a global ethic, this is controlled as a power strategy that occupies and delimits the spaces and, at the same time, is manipulated by strategies of global ethics that are often used to secure elitist spaces. In this sense, the relation between ethics, mathematical knowledge and the body is linked with politics. In the research process, using an ethnomathematics posture, it becomes an object act. In bottom-up exercises, where ethnomathematics really begins, the ingenuity that is part of the process of questioning global ethics is unveiled.

It is emergent to refine the local exercises of collective co-construction, previously proposed, permeating any imposition over the local communitarian mathematics education context. The work of the local communitarian mathematics educators aims, more than ever, at the transformation, emancipation, and civility (Balibar, 2011) of the local communities where they are working. In that sense, this work cross a cyclic process between questioning and collective co-construction of (1) a learning process in relation to local civil laws, (2) a critical analysis and bestowal of the right to interfere in humanitarian causes, (3) a local communitarian body that has a critical view of the positional and relational space of the societies, which makes the locus of human rights violations – collective situationality, (4) a relation between a lack of tolerance and the spatial limits of excluded or marginalized people, and (5) the comparison between local minorities and the global reality.

The interrelations between ethics, power, and the body are linked with the process of controlling and manipulating; it is intrinsic to logical thought, which is a collective representation. Power and ethics combine to take a dangerous hold upon the body, which simultaneously relies upon and produces knowledge (including mathematical knowledge). Both that concepts are manifested in mathematical knowledge relations that are conditioning in the emergence of human beings by focusing on the body. The body passes through this process with the intention of becoming itself, and is able to participate in economic activity where the terms are of uninterrupted subjection and to the detriment of its potential for plea and revolt:

> What was then being formed was a policy of coercions that act upon the body, a calculated manipulation of its elements, its gestures, and its behavior. The human body was entering a machinery of power that explores it, breaks it down and rearranges it. (…) Thus discipline

produces subjected and practiced bodies, 'docile' bodies (Foucault, 1979, p. 138).

The body, in this case, is fragile. It is targeted and produced by a neoliberal system and can become unknowable outside of its cultural significations; social and historical forces directly construct the corporeal reality of the body. However, it is important to stress here that the mechanisms of power, including a sense of global ethics, are not reducible to repression. Power and ethics are not only linked negatively in this vision, if the mechanisms of power and a global ethic were exerted only in a negative way. If it is strong, it is because this power and sense of ethics produces positive effects at the levels of wishing, of obligation, and of knowing.

If it is possible to constitute wishes, obligations, and body knowledge, it so happens by means of related disciplinary links, which are promoted by institutions such as churches, schools, and the army. The teaching of mathematics, in a school context, is an important support for maintaining a neo-liberal system, and targets production that naively obligates themselves to wishes predetermined by the system. The non-recognition of mathematical language from others, beyond the mathematical language of the traditional, scholarly and academic cultures, as well as the lack maintained between this language and the interdependences of human survival are some examples of the totalitarian forces, which uses strategies of power and global ethics to resist and exist.

The corporification and the identification processes, revealed and worked in the research processes, shows the extreme and emergent importance of dislocating the focus of the researcher/educator to the boundaries - since the boundary is the centre, at this moment), to the extremities of physical, mind, and institution bodies. This research has claimed such dislocation above all for having experienced that the societal bodies, those circumscribing (policy and economically) the local communities, accept, without seeking alternatives, to leave market and the non-political logic to social regulation. The material and immaterial effects that are produced show how much anti-universalists the societal bodies are and how they hyper-value the identity of micro-communitarism. This movement of appreciation makes the societal body a multiculturalist body.

4. Multicultural Racism

Multiculturalism is present in the technological progress brought to humanity with the possibility of being in different places for short times and, sometimes, with the possibility of being in many places at the same time. In the research developed from the emerging micro movements revealed here, one focus has been to observe where and when the human being has such possibilities. What has been found is that these possibilities are linked with the elitist spaces (social, cultural, and intellectual), usually presented in urban centres, and involve financial support from them as well. In fact, the technological progresses have brought the necessity of the human beings to survive into elitist spaces and in urban environments - it does not mean that they are in urban environment. As argued previously, the word "urban" appears to reinforce transcultural movements as part of the political and economical hegemony due to the predominant logic from the large urban centres. One trans-social thought is present in the current necessity of survival: the economics, in which such thought is the core of the human dialogue inside the current neoliberal system. Therefore, in one case this thought

appears as product, and in another it appears as production, showing how it is interconnected with the social life and neo-liberal system.

According to Žižek (1997), multiculturalism is the ideal form for an ideology of neo-liberal system. Ethnic property and communitarian identities are re-territorialized to the force and subjected to social bows, in which multicultural tolerance has been one key behavior. An attitude that treats each local culture to a version of colonialism – as a colonizer with the native people of the colony, for example, or as a colonized group where the customs must be delicately studied and *respected* - is a globally empty position. The word *respected* is in quotation marks to denote the non-respect that is produced through the totalitarian meetings that exist between who is colonized and who colonizes.

> Multiculturalism is evidently an inverted and un-confessed form of 'distant' racism: 'respecting' the identity of the other, conceiving the other as an 'authentic' closed community against which he, the multiculturalist, maintains a distance made possible by his privileged universal position. In other words, multiculturalism is a form of racism which empties the position of all positive content, the multiculturalist is not an open racist, he does not oppose the other's particular values of his own culture. However, preserves this position as an empty and privileged essence of universality, from which the other specific cultures can be adequately appreciated: multiculturalism's respect for the specificity of the other is the most efficient means of reaffirming his own superiority (Žižek, 2002, online).

Žižek has alerted us to the danger of reactionary and conservative multiculturalism, of racist multiculturalism (1997; 2002; 2011b). The respect and the tolerance towards the other are present in our daily routine; the respect and the tolerance exist while the other does not show his or her truths. The mystical knowing of the other cultures is tolerated but when the confrontations come through cultural practices as in cannibalism, the death penalty, tribal tortures, robbery (characteristic inside some social groups as a ritual to be recognized by the group), the clothed or unclothed styles, that is, with their own form of how the other practices are in his or her culture, multicultural tolerance lingers and the imposition of occidental values is promoted through *democratic* values, as in freedom and equality. This kind of racism was evident in every research experienced – revealed here, under different cultural practices as, for example, the strategies of robbery or location. Democracy (camouflaged by technological knowledge, ruled by power, and in name of ethics) is present as a totalitarian system in cultural encounters, is well structured in name, especially, of freedom and equality.

However, at the same time, the society of technology recognizes that multiculturalism (or cultural pluralism) is a term to describe the existence of many cultures in a place, city, or country, without any of them predominating. The process of the *word without word* is linked with global market logic and with the local non-politics, which is pointed out by top-down structures of governance. As such, this process is far from promoting either collective subject freedom or socioeconomic equality. In the experienced research with children in street situation, indigenous (inner and urban), fishermen and members of the *bairro* community, it became evident that the market logic and the non-political

are based in local social elitist agreements, founded in the prevailing global economic logic, and supported by the imposition of democratic values into other cultures.

Social agreements are open systems, where the word is recuperated to give voice to the social voices inside a given society, to allow voices from different groups that are not in the *winning culture* – the dominant market group. The inconsistency of the word, as demonstrated through intrinsic meanings of the term democratic, cannot survive in open systems where the cultural is a tool that promotes the exchange of energies across boundaries, and the processes of local knowledge is the main way to promote the movement and exchange.

According to D'Ambrosio (1998), "the denial of access to knowledge is a strategy for the exclusion of the different" (p. 70). It is exactly in this sense that the ethnomathematics posture operates, opening the systems through working at the boundaries, not allowing that the educational process inside a local community be colonized. When the researcher or the educator assumes this posture, the educational process (and research is one of than) is developed with the other and not to the other. The synchronicity of this posture covers the limits imposed by mysticism that, according to Restivo (1985), involves the performance of space itself of the cultural encounters into this process. To act in an ethnomathematics posture is to act in the *interculturality* – the dialogue of the multiple cultures aims at the *transculturality* – to be with other on the rescue of the dignity of the survival - reviving our kinship with the Earth.

Normally, when the act of sharing knowledge happens inside boundaries, it is blocked by its own practices in relation to the planetary hegemonic system and by the dominant socioeconomic culture. The institutions of knowing (i.e., the school, for example) and the learning and teaching of formal processes that are inserted into these institutions (such as the process of knowledge reproduction that is actually practiced in schools) are supporters for this system. The coherent goals and well-structured nature of these institutions do not permit the exchange of energies into the boundaries, they are not prepared to listen to the voices from diverse cultures; working only in pre-definitions, made up of ready models, and only using the daily examples that go with the current forms of multicultural speeches. The freedom of the exercise of encounter is nothing more than a current political tool to imbricate the mass behind labels of freedom: *yes, we can*; of equality: *from the mass, to the mass*; of unity: *we are all equals*; of fraternity: *we must develop laws and systems of education to recognize and tolerate the other*. According to Han (2014), "the positivity of power is much more effective as the negativity of duty" (p. 20).

Nowadays, as the children in street situations ensure the financial support of the local government to assist them, the indigenous ensure the charm of the cultural exclusion to the country that they are, the fisherman ensures the fish, and the slum ensures non-urban spaces oriented to welfare, the researchers, teachers, and educators ensure standardized thinking. In fact, the researchers and educators are nothing more than the complementary part, with different performances; the neo-liberal system creates illusory dichotomous positions. It is time to shake the current educational structure and assume that, according to D'Ambrosio (1986), the knowledge makes sense if it is understood as cultural, and that the production of knowledge are the cultural places, embedded by traditional rules by power relations in the name of the particular ethics. In the cultural

encounters the exchanges of knowledge, of power relations are involved – intra and inter-communitarian, and the global ethics in order to search the transcultural knowledge ways through new empowerment relations in the name of an ethic of diversity in the unity; respecting the incessant movement of life across time and spaces.

5. A Critical Search for our Kinship... Reminding that in these Researches Key Issue is for Whom?

The construction of this essay was made through an exercise of analogy between ethnomathematics posture and the theory of 5Rhythms to discuss, from a topological ontology view, a few images and actions constructed in critical ethnographic paths. This analogy is revealed only at the last point in order to give the reader the opportunity to travel into her/his own imagination, through her/his images and actions.

The 5Rhythms is a *movement work* developed by Gabrielle Roth - a theatre director, a recording artist, and an internationally distinguished author. This social body theory comprises movement practices designed to release the dancer that lives inside every body, regardless of its shape, size, age, limitations and experience – it is a libertarian theory. According to Roth (1997), to find the dancer that lives in each human being is an exercise to find themselves, at their own creative level. While the very practice recognizes itself as the essence of simplicity, it has a deep level on the complex bases in human design.

Roth (1997) defends what "doing the rhythms is about waking up your most essential nature, stretching your intuition and imagination as surely as your body; it awakens intuitive intelligence and artistic sensibilities" (p. 12). The social body theory was a way constructed in these experienced research to feed the study of human topology. With this theory it was possible to comprehend how an ethnomathematician is able to know the roots of her/his educational body, in a systemic sense, and how this knowledge is fundamental to search a libertarian educational/research process – in Paulo Freire's sense. In fact, the 5Rhythms is understood, here, as a learning tool that can be developed in a triple systemic movement of (1) recognizing the very self, a constructing knowledge on the very multiples identities, of each human being, (2) recognizing the very social body, where each human being operates, and (3) contacting with human interdependences.

In that sense, the educational body, i.e., the educational view over the spaces where the human beings encounter themselves, can be categorized through the five rhythms discussed here, which were identified as the bases of these spaces. The ethnomathematicians can all be social actors involved in the research processes and not only the academic researcher, as usual. This openness reveals the complex interconnectedness of the very local educational actions of all social actors involved in the research, as well as their recontextualization of the concept of space where they are operating. Here, we can identify with ontological eyes, according to the conjecture of Balibar (2011), cultural pluralism as a constitutive agent of the societal topological space.

The most difficult to accept is that some current philosophical praxis has invited us to shake our comfortable position as educational researcher and educators, reversing "our concept of what is possible and what isn't; maybe we should accept the impossibility of

omnipotent immortality and consider the possibility of radical social change" (Žižek, 2010, online).

As I have said, let us be intolerant with ourselves and "pass on to another stage" (Balibar, 2011, p. 21).

Acknowledgements

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