

Asphalt Children and City Streets

A Life, a City, and a Case Study
of History, Culture, and
Ethnomathematics in São Paulo

Mônica Mesquita, Sal Restivo and
Ubiratan D'Ambrosio



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DEDICATION

This book is dedicated to the memory of Susan Leigh Star (1954-2010) who did so much in her research to reveal and champion invisible work and workers; to Wenda K. Bauchspies, friend and mentor, whose voice and spirit have guided us; to Paul Ernest, friend, colleague, and inspired philosopher, for his help in placing this book; and to Lia Laporta, for supporting and encouraging each of us in her own ways, for her contributions to this book, and for becoming a person of integrity and independence before our very eyes.

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My dissertation and this book are for the children, children of the world, and especially the fourteen of you: 14, my “lucky number” my luck and the number that taught me how life is social and how the collective struggles in local communities could be the key to the open systems.

Priscila, Antonio, Capoeirinha,* Camila, Geni, Pinguinha, Pablo, Amarelinho, Núbia, David, Laulau,** Waldemir, Elizete,*** Toninho.

*2005. The year we suppose that Capoeirinha died. We assume he was killed on the streets of São Paulo after a confrontation with the police; he disappeared from his street brothers and sisters and me.

**2006. Laulau died three years after he was exposed to a clandestine (illegal) kidney surgery; this is an infamous and silent theft of organs and asphalt children all over the world are frequent victims.

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***2007. Elizete died after being turned away from a private hospital in the city of São Paulo. She was suffering from serious complications after giving birth to a premature baby.

by Mônica Mesquita

PROLOGUE

THE ETHNOGRAPHIC IMAGINATION

We present here a collaborative effort in ethnography, one in which the “I” of the narrator is at once a subjective sign of authorship but also an illusion that masks the social nature of the “I”. The “I” is, indeed, a grammatical illusion to recall Nietzsche, and sociologists like Erving Goffman have reinforced this counterintuitive insight. The “I” of Restivo – the illusion that hides a sociological community and language game – has been present throughout, especially in constructing this document as one that respects the English language. That “I” has also been present in constructing the Durkheimian presence that is pervasive throughout this work, and in co-constructing and applying the idea of social constructionism. The “I” of Restivo has provided anchors for language and theory, notably in terms of the sociology of mathematics. The “I” of D’Ambrosio – the illusion hiding an embodied renaissance – has been present as the Portuguese and world voice of ethnomathematics, and of issues in ethics and social justice. The “I” of Mesquita is the I of the ethnographer on site, the researcher in the midst of her culture, telling her story and letting the voices of the children of the street – the asphalt children – tell their story at the same time, something that requires extraordinary field skills and skills of writing and translation. Mônica’s voice is a Portuguese voice struggling to speak in the voice of the “dominant, colonial, imperialist culture of the capitalist West”. This is the West that Mônica experienced growing up in Brazil. This struggle is always and throughout accompanied by resistance, a resistance to the subjection of the Portuguese voice by the colonial English voice. Mônica’s working out the ways to represent her Portuguese thoughts in English and Restivo editing as the arbiter of the English language have been designed to transmit the struggle of Portuguese versus English – language versus language, culture versus culture. In this process, we have together tried to capture the struggles and conflicts of a researcher straddling two worlds, two cultures, two languages, two sets of academic expectations. There will be moments of difficulty navigating the inter-temporal, inter-cultural, inter-historico-spatial language for readers in spite of the editing process. This is a deliberate consequence of the self-imposed limits of that process, carried out with the intention of sustaining the voice of the oppressed travelling through the world of the oppressor.

The intricate and intimate ways in which the authors’ lives and works weaved their way through this project necessarily complicates the voice of “the” narrator. The “I’s” and “we’s” appear like ghosts as we make our individual and collective presences known to the reader. Consistency and

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continuity will sometimes seem compromised as we seek to play across our social individualities. Our trinity is constantly dancing in and out of itself, its selves, the narrative, and our unities and differences. Moreover, we know of no other ethnography that relates the portrait of the ethnographer growing into his/her research site almost from birth. We see in the first part of the book the awakening of the sociological imagination maturing as Mônica comes to embrace the sociology of Emile Durkheim. Durkheim's life, work, and background is followed in great detail because it is the key to a relatively unknown way of organizing our views of and ways of knowing about social life (a way ignored, misunderstood, and misapplied even in some centers of the West's sociological community). In the second part, Durkheim's spirit moves into and through the unfolding of Mônica's life and of the ethnography of the asphalt children. This is as it was.

Mônica Mesquita, Sal Restivo, and Ubiratan D'Ambrosio, February 2011
(Lisbon, Troy, and São Paulo).

**PART I: INTRODUCTION, BACKGROUND,
METHODS AND CONCEPTS**

CHAPTER 1

MÔNICA’S VOICE: SOME ETHNOGRAPHIC “IMAGES & ACTIONS”

To begin with ethnography is to begin in synchronism with the actions and images of this research.

You learn ethnography through practices, and perhaps a little bit of apprenticeship. There are guidelines but few rules. More or less anything goes (Buraway, 2000: 25).

I, Mônica, grew up in an urban area, in the city centre of São Paulo – a megalopolis of Brazil, exchanging energy with certain modes of life – urban modes. The people that live in the street have their own mode of life and this mode impacted my own mode of life in many powerful ways. In the life of the street, a newspaper becomes a blanket, a button is changed into a weapon, or a piece of cardboard becomes a wall. These are some of the actions and images that showed me the connection between the production of knowledge and the rupture of the amorphous veil that covered the city of São Paulo at the end of the 1960s. The exercise of ethnography comes as a tool to know and describe knowledges existent in this mode of life, intrinsic to the urban space.

The urban space increasingly becomes a space managed by policies of beautification and controlled socialization; enclosed and watched spaces. Neoliberalism is an example of the policy of beautification and controlled socialization, an example of the policy of “unique thought” and the new world order after the 70s. In a country like Brazil, tormented by a history of colonization and military dictatorship, the new world order has created gaps separating cultural groups within the urban population and making some of them invisible.

In that sense, this ethnography (ἔθνος ethnos = people and γράφειν graphein = writing), as a tool to know and describe processes of urban social human phenomena, has as its central focus some invisible human beings –children of the street. The ethnography was not a choice; it was the real movement around this research, which allowed the voices of all participants to appear constructing this research. This research began as part of a project of life and was “walking” as part of projects of lives. The social phenomena described in this research will always be linked with the mathematical knowledge of these children, more specifically, their concept of space. However, these knowledges, embedded in ethnographical images and actions, will be approached through

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the systems in which they are intrinsically linked, focusing on some of the contexts permeated by them.

The voices present here are in constant interaction with my voice, in a dialogical process, constructing a work in which I understand that every voice has the same energy, has the same rights, has the same values. These voices draw attention to the myth of the visibility that the larger society has given to every “thing” that is in a marginal position. The myth is part of the neoliberal movement and it keeps even progressive governments from acting to unveil the myth and acting on behalf of the marginal groups and classes.

The larger society, arrogant in its material and intellectual predominance, fails to act legally or otherwise on behalf of marginal peoples. The welfare state is designed to maintain the new world order, watering the hegemonic system in which we are living, and keeping the marginal peoples invisible – unreal, inactive, docile, and as poor human beings. The tools of the new ethnography and the older tradition of action anthropology reveal that the urban population is also marginalized, acting and reacting in the process of urban social construction.

The first images and actions of Chapter 1 come to present problems and perspectives realized after and during this research; they come from my experiences in the urban space. At first, I invite the reader to dive into the urban space, through two terms that provoke and inspire me to be in the urban space: the urban non-space and the invisible beings. I developed the term urban non-space faced with the necessity of identifying the space of urban social relations marked by the visual intersection among marginalized and non-marginalized groups and strongly denied by both groups. The term invisible beings is present in many academic works from different areas but here, it is present and developed through the voices of the children of the street.

Still in this first part, my “I” begins to become the “we” of this project as the research question as well as the process of the question before and during the research comes into focus. The big question is a question of the act of the human being as a social fact. This is followed by the question of non-dialogue in intersectional urban spaces. This encompasses the silence of certain mathematical knowledges possessed by marginalized urban groups, the mathematical knowledges of the asphalt children. These questions and problems converge on the space concept of these children. The importance of this question as well as the social relations of Mônica’s track will be made clear as this work unfolds.

In a second moment of Chapter 1, Mônica shares scenarios and narratives that she proposed during this journey, discussing “the why’s” and “the how’s” of her track.

“Só eu vejo o mundo com meus olhos.” (Baleiro, 2005)

DIVING INTO URBAN SPACE: THE URBAN NON-SPACE
AND THE INVISIBLE BEINGS

Before presenting the primary steps of this research, we must dive into the urban space through a discussion around the urban non-space and of the invisible being as well. It is necessary too to share Mônica's experience in this diving process with the reader in order to convey the strength of the background present in her ethnographical eyes. While working with asphalt children, and not only with children, in the city centre of São Paulo, she could realize the existence of a space where the urban population transits but denies its transition – using but not acting.

Normally, urban populations do not recognize the social relations between marginalized and nonmarginalized groups revealed in this space. To the non-marginalized group, the other – marginalized group – became invisible, even though they have rights or urgent needs as citizens. In the case of this research, the urban population is constituted by people that are asphalt children and people that are not asphalt children. To be invisible is to be in the marginal space of the major society, is to survive without being directly included in the ethical and power relations of the major society, developing “invisible” ethical and power relations.

This way of life demonstrates that life is more than capital and more than the specific knowledges that ground and sustain this capital. Žižek (1994; 2005) works with the idea of human beings that are IN (human beings included in the legally regulated society of well-being and human rights), and that are OUT (from the homeless of our urban cities to hungry Asians, Americans, and Africans). It is necessary to add that being IN is having material and intellectual visibility in the neoliberal forms of life and in the hegemony of the urban spaces. Being OUT is not having material and intellectual visibility; to be OUT is to be invisible in the most profound human senses. Observing the social relations between the invisible and visible revealed that the denied space where these relations happen could be categorized. What gradually appeared in awareness was that the ethnographer, the person of Mônica, was someone who was engaged in these social relationships. This is the urban non-space and its main characteristic is the presence of the cultural groups which are materially and intellectually marginalized in the urban central areas.

During the Industrial Age, the urban marginal groups were usually located on the outskirts or the periphery of the city or controlled by putting them metaphorically and literally in chains (in prisons, mental hospitals, and reformatories). The continuous and increasing presence of these cultural groups in urban central areas affects directly the social relations of the major society, generating not a mutual symbiosis but a capitalistic natural selection; the marginal cultural groups went through an elimination process founded in

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their inability to adapt to life in the urban central areas. In the next step, they became invisible.

The movement of the marginal cultural groups into the urban central area appeared as a topological answer to the conurbation movement during the Industrial Age. This movement has developed the non-space (i.e., unidentified and unidentifiable physical space) organized around entropy and anomie. It is here that we find a space for a certain kind of invisible set of social relations. In the urban non-space, the social relations happen in a process of natural capital osmosis. However, the fear of the invisible other becomes the consequence of a wall itself in the eyes of the visible one. A wall of anguish, constituted, among other things, by the clogging of bodies in the urban spaces, by the manipulation of the appearance of a constant threat posed by the invisible other. The legal and ethical control over bodies is broken by the creativity and different values coming from the invisible other. The phenomena of non-space is not centered in cities. It can be observed in a zoom-out movement focusing on states, countries, and the whole world, as well as the conurbation phenomena at issue in this project.

It is relevant to remember that many urbanologists in different academic areas develop their works around urban spaces. Some of them, such as William Whyte (1980), Henri Lefebvre (1991), Marc Augé (1992; 2005), Boaventura de Souza Santos (2000), Michel de Certeau (2001), Sheepers (2004), and Rhomberg (2004) characterized some urban spaces as small urban space, place, nonplace, shared urban communities, space-times, urban art space, and urban discontinuity. These ideas helped to give structure to my thoughts. However, in none of those works did I recognize what I felt living in deep contact with the marginalized urban groups. This gave rise to the necessity of claiming for myself the idea of the urban non-space.

Marc Augé (1992; 2005), an anthropologist who explores the non-places, alludes to the undefined, inexistent, or anonymous spaces where the past is confused with the future, approaching the solitude of the individual in what he designates as supermodernity. Some examples of non-places are the Internet, a hotel, or a street. This work was very significant in my effort to identify what I experienced in my urban life, my urban experiments. However, this work has its central focus, through anthropological eyes, in the ethnology of solitude in the post-modern world. The focus of the urban non-space is its existence, its material invisibility and relational visibility, its intersectional and non-individual characteristics, characteristics that I present and discuss throughout my research.

WHAT IS MY QUESTION?

I do not know if I can call my question “my” question. In this research, I discuss a large question that I understand as being about coherence between to be and to be in – the question of the act. To be alive and to survive means to be

with... with the others of the same species, with others of the different species, with the inanimate others, and with the others inside us. These “others” could be seen as constitutive beings of social ecology – systemic and complex nets existent among all living organisms and fed by social acts.

The species in focus here is *Homo Sapiens Sapiens*, but looking directly to the relations existent among all the living species. In that sense, to argue about the act is to claim our social condition as human beings. The reflection started with me, as the narrator of this research and idealizer of a work where this research is inserted, and is founded in different modes of urban life and its social relations in urban non-space.

I am a human being, I am a social being, I am a product of the social and I produce the social, my mind and my actions are social and therefore a reflection of my social ecology in the systemic and complex nets existent where I am.

Where am I in this research? I can say that my social ecology was at the middle of an urban area. I was born in São Paulo, the third largest city on Earth – a megalopolis. To be born in an urban area, at the period that I was born – 1965, where the migration to this megalopolis was reaching its maximum, is to be born and raised with the question of poverty as one of the foundations of the social construction “the urban.”

In the occidental mentality, that actually left its geographical position and could be found all around the world, human beings are recognized by their properties. The properties range from material things to intellectual things. The quantity of properties has a great value; the actual values are in what we have and not in what we are, or I can say that we are what we have. The quantity of properties is supported by the recognition and the validation of certain knowledges or by capital. It is these knowledges and capital that sustain the hegemonic systems that we know as urban areas. Knowledge and capital appear intrinsically linked by the value of intellectual and material properties.

The recognition and validation of certain knowledges, defined as correct and necessary, is determined by the necessity of maintaining the hegemony of the current system in urban areas occidentally organized. However, to recognize different knowledges, not recognized as correct and necessary for the urban population, is a normal practice of the major society, fortifying the myth of “partners” as much in material as in intellectual properties. To know the knowledge of the “others” is a tool of the post-modern movement to promote corporification, letting the “others” become and be invisibles. These others are not responsible for their acts, their strategies are unusable, and they are “accepted” in a process of multicultural racism.¹ The real validation of these different recognized knowledges has not been practiced; it has only been a matter of merchandizing human knowledges.

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The central point in this research is to question why the mathematical knowledge of the asphalt children's culture is not recognized and validated by the urban population? From this question, we are led to realize that the recognition and the validation of the asphalt children's knowledge could be a step toward eliminating the idea that they are victims. We can come to see them as a real cultural group, as active human beings, and not as fragile, docile, or aggressive children.

The urban marginal space, like all marginal spaces and everything that they represent, is actually treated as "good" object and "bad" object. On the one hand, the "good" object of the marginal space represents a character of being passive, suffering, being a poor object. On the other hand, the "bad" object of the marginal space represents a character of being aggressive, being selfish in its ethics and power relations. Both sides of the urban marginal space promote the surplus value of the urban population; they are ways of manipulating capital through the appropriate knowledge of each side, as for example, assistance projects or putting people in chains, respectively.

It is normal to link the urban marginal space with the "third world"... and all my experience comes from the "third world", from South America – Brazil. However, the urban marginal space has no fixed place; it can be found at any place of the world, the single existence of a different mode of life that opposes "society" defines this space. To be active inside an invisible cultural group (that is in the margin) is a risk to the normalized, the domesticated, society. This risk is based on the obedience of pleasure. Meanwhile, to be active inside a visible cultural group is an illusion, an illusion based on the pleasure of being obedient. To be active is a condition of living in open systems, exchanging energies with all systems that the activist is part of, promoting the act of dialogical interaction, not watching as an outside audience but acting as an inside actor.

The role of this research is to share, to recognize, and to validate, making some mathematical knowledges of the children in street situation (an urban marginal cultural group) compatible with the mathematics of the Academy (an urban non-marginal cultural group). I effect this ethnographically, arguing around some notions of the space concept of asphalt children's culture.

In that sense, I considered the question previously mentioned as the main academic focus of this research in its first steps. However, during the research process itself, the cultural legacy of the children in asphalt children's generation made it impossible to restrict the research to one point, to one question. The complex and systemic approach, in which this question is involved, was analyzed, observed, and described in different voices and a resonant effect of this question can be observed throughout the research process. This allows the recognition and validation of mathematical knowledges of these children by different urban cultural groups.

WHY IS THIS IMPORTANT?

While working in two different urban cultural groups, it is necessary to consider why the primary question of “space”, and all resonant effects that exist around it, is important to both groups and in the wider society. Through the voices of the main actors of this research, we can listen to an invisible culture: “Saca só Mônica, se tu canta pros home que nós sabemo o mesmo que eles, mas de outro jeito, eles pode enxerga agente e dexá agente sê o que somos, num é?” (Priscila, 2000) “Sei não Priscila.... Eles pode sumi cu’agente pra eles sê os bom!” (Capoeirinha, 2000) “Tu acha brother, que eles vão fica preocupado cu’nóis? Tá noiado!” (Camila, 2001) “Dô a maió força pra tu, Mônica. Quem sabe nós ganhamos cor... quem sabe eles começam querer saber o que queremos invéz de fazê agente querer o que eles querem!” (Antonio, 2001)

As the asphalt children argued above, one point of this research is to work at the intersection of the urban spaces that exist between different urban cultures – the non-space. My research is about arguing, sharing, validating, and knowing well their mathematical knowledges with the objective of giving more visibility to this urban cultural group. In that sense, the concept of space question is fundamental to the work of revealing the potentiality and limitations of these children and of the urban population that they live within. It is interesting that the dialogue proposed in this work has as its basic focus the knowledge, and not the rhetorical assistance, which penetrates and feeds the urban non-space. However, the process of arguing, sharing, validating, and knowing well some mathematical knowledges, found in different dialogues, can be a “knife with two cutting edges”.

As this research was being developed in an ethnographical way, other knowledges appeared. To be in open systems – as the ethnography claims to be – is to be in a fragile position, is to be acting, is to be a script writer where the real voices of the script would have no material or intellectual hierarchies except in a dialogical process.

In that sense, it is very important to pay attention to the plurality of ways in which this kind of research could have unfolded. As Capoeirinha pointed out in the second voice of the previous page, it is necessary to be “smart” so that the wider society cannot use all this information to exterminate the asphalt children’s culture; or so that the wider society, including the voices of this researcher, does not make these knowledges even more invisible through not validating them or making them compatible. One must be alert to punishing behaviors in which they express their knowledges or continuing with the assistance eyes over them. “Tamos ai Mônica, sem medo de ser feliz. Leva isso pra eles e quem sabe! Trabalhamo muito e acho que temo que mostrar... é o ato que tu fala, não? Temo que faze esse ato de dividir.” (Antonio, 2001) “Medo... que noia!!! Num vai dá em nada... eles num vão saca nós nunquinho! Isso foi legal pra nós... somo diferente agora. ... Ah! Somo mais intendido de nois

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mesmo, do que rola aqui nas nossa cabeça, das nossa história, somo mais brother e sabemo que queremo memo fica junto.” (Camila, 2001) “Se liga Camila, de repente os home vê e as coisa melhoram pra eles. Melhoro pra gente, num melhorô? Somo mais brother... sabemo mais de nós e de tudo, igual cê falô” (Priscila, 2001) “Ainda acho que vai sobra prá nós, sempre sobra! Mas não mando sozinho não... nessa somo o conjunto todo, fomo até agora e seremo até o fim. E também é bom que eles... (eles quem Capinha?) ... os home claro! ... eles saca que somo bom mesmo no que fazemo! Será que eles sabe o que faz? ... (Acho que sim! Mas o que tá rolando na sua cabeça pra pensa isso?). Tô pensanso se eles conhece o espaço deles, se eles ficam junto conversando o que nois som pra eles igual tamo fazendo aqui. (silêncio).” (Capoeirinha, 2001) Iii... tá noiado Bro? Claro que não! Nois, se somo alguma coisa, somo mesmo é fantasma... dos mal, dos fudido!” (Camila 2001)

In the voices of the team, even being fragile beings in an open space, arguing, sharing, validating, and knowing well their different knowledges relationship to the “large society”, it is necessary to exchange energy, to give life to this research, to let the voices come and be.

The voices of the asphalt children led Mônica to the space question, and its echo: the value of their product. The social activities developed by the children during this research could be observed and discussed by the children themselves, from their historical urban position to their urban social acts.

From the academic point of view the question of the concept of space is approached in a large field of work in different areas. The relevance of this question in this research, looking through the academic lenses, is located in two needs: to bring new knowledge, to Mathematics Education, Sociology of Mathematics, and Ethnomathematics; and to explore the roots of these very same academic knowledges.

The academic works have not presented researches looking over the asphalt childrens’ space concept. In some cases, researchers have approached this question with other cultural groups. For example, Sonia Clareto (1993), from Brazil, discusses space among the “Caiçara2” community and Stathopoulou Charoula (2007), from Greece, analyzes the way a Romany (Gypsy) community perceives ideas about space. In other cases, researchers explore other questions focused on asphalt childrens. For example, Ricardo Lucchini (1988, 1993, 1994, 1996), analyzes the life styles of “street children” around the world through the eyes of a sociologist; and Lewis Aptekar (1988), has carried out an ethnography about Colombian “street children.” Renuka Vithal in 1998, at the first international conference on Mathematics Education and Society at Nottingham University, organized a Discussion Group (DG) on Working with Street Children. It was the first, and a unique, movement to integrate Mathematics Education and asphalt children cultures. The promotion of this DG was accented in her experience in a shelter of “street children,” or more specifically, female asphalt children, called Tennyson House in Durban,

South Africa. The experience in this house consisted of a tutorial programme in which student teachers take responsibility for the mathematical growth and development (schooling in mathematics) of a learner who lives at Tennyson House. Renuka acted in this programme as a mathematics teacher- educator in cooperation with an educational psychologist, Cheryl Smith who works extensively with street children.

This programme was designed to achieve multiple goals based on the principle of reciprocity and, from my point of view, had its main focus on the student teachers and not properly on the children in asphalt children's mathematical knowledges. Renuta (Vithal; 1998) describes her experience as follows:

As a teacher-educator, it gave me new insights in understanding what it means to become a teacher among a coastal people whose lives are linked to fishing. It was clear that knowledge and skills in teaching mathematics were developed but the programme offered an opportunity for student teachers to learn to be 'caring' towards learners in their mathematics teaching and to show commitment and dedication. They were learning to teach mathematics in a context in which it mattered if the learners learned because the consequences of teaching and learning or failing to teach and learn were authentic and tangible. It was a chance to make a real difference in the life of a young person whom society had almost given up on. My research, by contrast with these earlier efforts, proposes to work with the asphalt children's space concept, focusing on using the mathematical knowledge to rethink and discuss, in a dialogical process, the general question of the space concept in culture. The transposition of the knowledges will be explored, discussing our knowledges in a large context, observing where, how, and why our knowledges are intrinsically linked with our acts and with our visibility to the large society. The value of knowledge is approached. To know the knowledge is taken as a value, as an exchange value, as a positional value, and as a survival value in the current urban non-spaces.

THE SOCIAL RELATIONS OF MY TRACK

The basic approach of this research came from the social relations developed through my track; to be in the boundaries mixed with different urban cultural groups. The possibility to be with both cultural groups, the asphalt children and the Academy, allowed me to bring different points of view to the same urban images and actions. From the confrontations of these differences appears the necessity of searching for material and intellectual artefacts to develop a symbiotic movement between them, to promote a dialogical process between them. To observe that the space concept of the children in street situation's

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culture was different from the space paradigm of the urban population was the first step toward trying to find ways to understand their concept better. A paradigm controls the logic of the discourse; it is a way to control the logic and the semantics at the same time. It is a relationship that includes and excludes persons, ideas, artifacts, and values (cf. Morin, 2002). To be in the boundaries and to realize that the paradigmatic act nourishes this situation was one of the social things that the contact with the asphalt children's culture taught me. The complexity intrinsic in human relations could be observed through four main characteristics, according to Donnadieu and Karsky (2002): blurring and inaccuracy, risk and instability, ambiguity, and uncertainty and unpredictability. These seven "terms" were and are evidenced by voices in this research giving dynamism to a unity of social relations among images and actions present here. This unity is represented by this research, which can be considered a system in Morin's (1977) sense. According to Morin a system is a global unity of interrelations between elements, actions, and human beings. The script of this research contemplates all voices from both cultural groups involved, creating a dialogical space among them. In that perspective, I report the scenarios and narratives used in this research to make the social structure voices of Children in Street Situation and the Academy transparent.

SCENARIOS AND ETHNOGRAPHIC IMAGINATION

This ethnography can be understood as a play where the voices are the voices of actors that, from different approaches, were involved in constructing it dialogically with the same intensities. When a play is being prepared, it is necessary to think why and for whom it will be created. In this case, the play was created to share specifically the voices of some of its actors: the children in street situation of São Paulo. However, this is not the only reason for which this play was developed; it will be more than enough to produce a book, or to develop the continuity of this project, or still to be in locum with them to share their voices. This play comes to attend the asphalt children, bringing their mathematical knowledges to be argued in the academic environment, letting both cultures, Academic and Asphalt children, relate through knowledge and not simply through compassion.

The suggested play has a background scenery – the asphalt scenery, as you can see in that previous picture and can realize during the description of the research. The asphalt scenery was the urban street of São Paulo, more specifically the urban streets in the city centre. However, to share the voices that were in the background scenery in a dialogical process it was necessary to overlap another specific scenery – the academic scenery. It happened in accordance with the audience of the Academy, so that the content of the script would be presented in that context and argued dialogically.

The form of this election was centered in the interlocutor of both sceneries, the scenery where the things happened and the scenery where the things will be described. The interlocutor has the role of the scriptwriter of this play; I am with my collaborators, the scriptwriter. In a first moment, it could sound like a decision based only on my selfish or self-focused desires as a human being living in both scenarios – perhaps that is the case. To describe how mathematical knowledge is active in the asphalt children's culture, being a crucial tool in the construction of their culture, to the interactive target public – the academic one, sounds like a strong reason to be selfish.

This supposed selfish movement, locked in my desires, involves other desires existent in both of my scenarios. In the academic scenery, I could realize some voices having my desire as their desires – the desire of understanding the ethical and power relations in social life, the desire of claiming action. These voices are represented in this spectacle by the interaction that I invited them to in some synopses present during the first part of this play, traditionally called the "theoretical framework."

Emile Durkheim is the first academic voice to enter part one of this play. Durkheim's voice comes to discuss the fact that questions about society are linked with questions about human potentiality, about human limitations, and about the human condition of social human beings. Society, he says, is an immense cooperation that extends not only through space but also through time and can be considered as being not simply a set of institutions but a collective way of being emergent from diverse forms of human relations. Durkheim today would be in the camp of the strong social constructionists. He emphasized the necessity of taking full account of the interrelations between religion, education, politics, family, and culture, along with geographical and historical location. These factors altogether shape the complex realities of human social life. Durkheim's voice is the primary foundation that supports the academic voice in this research.

Some academic voices are invited to discuss concepts which I could realize only in locum. A vast literature was studied for the construction of this part, which discusses some new concepts as well as some concepts previously cited in different ways. These voices of the script come from academic voices existent in the background scenario, in the asphalt. They are voices born not from a contemplation movement, but from observed or, sometimes, from lived actions in the asphalt.

As the focus light of a scenario, Slavoj Žižek's voice appears recursively shaping all scripts with his central idea about the human being. According to Žižek (2000: 109), the human being cannot be reduced into symbolic codifications of "otherness" which offer opportunities for self-realization, but are real, "unavoidable neighbors whose very particularity confronts the individual with universal demands and obligations that cannot be ignored". His voice comes into the last phase of the research, in the preparation of the final

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writing, as if many times he was there, seeing with my eyes the images and actions in locum. Definitely, Žižek's voice remind us of the human focus claimed by Marx, Durkheim, Restivo, and D'Ambrosio; he locates the origins of social life in human capacities and potentialities, which are able to develop through our social construction, our interaction with the others of any species. Still in the academic scenery, but in all parts of the script as design costumes to compose a scene, the constant and deep interaction that linked Mônica Mesquita, Sal Restivo and Ubiratan D'Ambrosio and their works as co-constructors of this project.

This intimate collaboration contributed to the overlapping of this scenery through our commitment around the same desires – the desire of knowing, recognizing, validating, making compatible the knowledges of the human beings, the desire to be in the boundaries, exchanging energy. Sal Restivo and Ubiratan D'Ambrosio's voices are the academic support that bring into this script mathematical language without mysticism, as a product of human beings, socially constructed by different cultures in different times and spaces. The traditional and Platonic paradigm of mathematics is broken through their and then our collective social speech about mathematics, making visible the mathematical knowledge of the asphalt children's culture. Intensive desires can be found in the asphalt scenery through different voices. Many voices are in this scenery, including the voices of the asphalt children. However, the urban street is an open urban place where the plurality of these voices, excludes the voices of these children, sharing a "single thought" – the asphalt children are victims and they need help; distant help, as we will see come into view as our inquiry unfolds. However, it is necessary to note that in the actual political moment in Brazil, the necessity of letting the asphalt children be defined as victims is a socio-political focus.

In the middle of these voices situated in the asphalt scenery, claiming the character of victims to the asphalt children, these children resist. For a first instance, the resistance is promoted by the large society as a necessity to maintain the mode of production inserted in the urban cities. This contributes to maintaining the hegemony of the system. It is, actually, part of the urban social construction. For a second one, the children in street situation resist under their voices claiming by "color", as we heard Antonio proclaim earlier.

The second part of this play is shared among street voices. At the beginning historical, geographical, social, cultural and love contexts of asphalt children in São Paulo are brought into our light, letting our minds fly into their scenario in locum – the urban streets of this city. Their voices appear through my voice and through the voices present in my social relations in this locum. My experience arises in these contexts; some histories of life are presented, some images are shared, and some observed actions are described and, sometimes, analyzed by the academic voices.

The importance of this part is revealed in the general context, where knowing of these five contexts that we present is having a universal view over the marginalized group in question. There is no need to describe the contexts of the other group because as a non-marginalized group its knowledges are much more expansive, and much better known in the larger society.

In the middle of the second part, the script "frees the voices" of two asphalt children's subgroups from São Paulo. We see who they are, how they understand the streets, their position within their culture and within their ecological system; and we encounter some aspects of their space concept. During this process, the guests from the academy are invited to maintain a dialogue with the asphalt children's voice. However, this invitation is nothing more than my academic representation in dialogue with the data of my asphalt children's representation. This is a process that evidences the dialogue between both my identities, which is mediated by the knowledges of both these urban cultural groups that I inhabit.

To finalize the script, but not the research, it unfolded around final steps that are dedicated to the social relations of asphalt, a unique scenario where the play goes on in multicultural voices. The asphalt, the central limit where human relations are developed in our time, is approached to claim attention to our street acts. The complexity of the street system is portrayed in this script. The script links the quiet street voices of the visible cultural groups, normally categorized as quiet acts of reading, to the voices of the asphalt children. These asphalt children feel the silent street noises echoing in their actions, in the reactions to their actions, and in their minds.

Searching to live a dialogical interaction, I developed a script where all the voices from both cultural groups that I was working with, and all the voices and images that permeate their social relations, could appear and exist. The act of surviving to prepare this script like that is strongly linked with the act of surviving of the children in street situation as a cultural group; we both seek respect and visibility in the larger society. To respect the multi-linguistic and multi-perspectival aspect of this script, it is necessary to maintain the original language of each actor present in it. To have intellectual visibility in the larger society, the script needs to be in a language where the knowledge of the street children could be divulged. English translations are provided in the appendix.

The first strong movement of this script appears in the language I chose to write in. The main language is English; however, the voices of the actors were maintained in the original language they claimed for themselves. The survival of this script through the English language was hard but necessary to maintain the coherence with the developed track by the scriptwriter. Why the English language?

When Ubiratan D'Ambrosio learned about my assistance work with the asphalt children of São Paulo and about some questions around the space concept that I exposed him to, he suggested that, among other things, I make

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contact with Sal Restivo's work, which he said was in English. At that time, during my Masters Course in Mathematics Education at the Pontifícia Universidade Católica de São Paulo, I had read many texts in French and some in English. English was not comfortable for me, culturally speaking. A strong "bombing" against everything that was American, including the English language, was the landmark of the time that I was born.

The movement against the English language developed during the 60s in São Paulo had two results. By one hand, there were people that took advantage of this to learn this new language in the great centers of Brazil. By the other hand, there were people who tried to react against the learning of this language, thus reacting to the abrupt political entrance of the U.S.A. in Brazil; my family assumed the second posture.

Beyond that, before I had time to know Sal Restivo's work, Ubiratan D'Ambrosio also suggested that I participate in an international congress that would happen in less than two month after his suggestion, the Second Mathematics Education and Society conference. I was very excited to go after knowing the title of papers and plenaries proposed by the Scientific Committee of the congress and more excited to know that it would take place in Portugal – Montechoro, which made me more comfortable in terms of the question of language.

I went to Montechoro; Cristina Maranhão, my Masters course advisor and I prepared a paper, a dialogical exercise, which was accepted. It was the first paper of my life; it was a little bit far from the central point of this congress and it was sent out of date to the Scientific Committee. However, I did know that it was an important step to understand, through academic lenses, the nature of the concept of space of the asphalt children's culture. In this meeting, I found theoretical support to dive deeply into the academic culture.

The process of this academic search was developed with the asphalt children with whom I was in daily contact. On the previous days of the meeting, I was engaged in the new tasks. Ubiratan D'Ambrosio had suggested that I prepare my presentation in English. Like a robot, repeating word after word what I knew by heart from the preparation phase, I presented my paper on the first day, not about the question of space and children in street situation, but a question linked with my Master's thesis. After that, during dinnertime, I began to share my street experiences with Henrique de la Torre and his wife Lula. He listened to me and invited other colleagues of the conference to listen to my street experiences. I tried to survive with my not so improved English and, from this necessity, I could realize that learning English was important to give visibility to the knowledge of the children in street situation. English was the necessary language to let my experiences be understood around the world, mainly by its main arguer Sal Restivo and all street voices in the academy. This was the way to give visibility to the knowledge of the children, of their autonomy within

SOME ETHNOGRAPHIC “IMAGES & ACTIONS”

the division of labor, of their contexts of life, of their strategies of survival, of their life in the margins. Getting to know Sal Restivo and Wenda Bauchspies in Montechoro motivated me to improve my English. They cared, showing much patience and respect, to hear me, to go in through my street experience, and to share discussions which have been, without doubts, the greatest guides of this script. In this way, and in this time, Sal Restivo entered the trinity of voices with me and D’Ambrosio that you hear throughout this text.

The exercise of co-existing with the English language, which I had experienced in my life as an oppressive tool of the hegemonic West, has taught to me the real importance of intellectual property in the postmodern world that we are living in and the real difficulty of surviving in the middle of the asphalt jungle.

NOTES

- ¹ Slavoj Žižek identifies multicultural racism, as a post-modernist movement. This will be discussed in the next chapter.

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SOME SOCIOLOGICAL “IMAGES & ACTIONS” THINKING AND SEEING - DURKHEIM

THE THEORETICAL SEARCH FOR A SOCIOLOGICAL VISION OF THE ASPHALT CHILDREN.

Two approaches have predominated in the study of asphalt children. The first concerns the reasons that drive children to the streets and the conditions in which they endure their existence, with particular reference to the strategies they use to guarantee survival. Observation and ethnographic methods are typically used in this form of research. The second is focused on the policies designed to care for street children offered by a range of public and private organizations, and the evaluation of these policies using various types of impact assessment. In this research, I use a theoretical model of social class to study the childrens' conceptions of space according to three dimensions of their lives: their autonomy within the division of labor; the cultural context in which they develop their processes of identity construction; their strategies for solving problems every day and night. I argue that for the asphalt childrens, the conception of space is linked with other social practices. My approach is to sound out and write about social ways of talking about mathematics and space, using terms such as social class, self-governing, culture, racism, values and social power and ethics.

This approach gives a more comprehensive view of the asphalt children's life experiences. It illuminates issues about self-governing, cultural identity, and social relations. It emphasizes the role of children as social agents who are actively engaged in the construction and exploitation of social capital. I base my work on Durkheim's theories, especially some of the points that he developed about the reality of society: social things, social being, social self, division of labor, solidarity, social facts, sociological method, and logic.

DURKHEIM – A SOCIAL BEING

To explore some points from Durkheim's theoretical framework I decided to write a brief description of his life and his social environment, in sum his social construction as a social being. This description was developed during fifteen days in 2005 that I spent at Épinal, situated in the Vosges' Region of Lorraine, located in the northeast region of France. The data for this topic came from a search in the Bibliothèque Municipale d'Epinal (Bibliothèque intercommunale d'Épinal-Golbey) and in Archives Départementales d'Epinal. Why should we

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devote so much space to learning about Durkheim the human being and his social environment? The reason is that Durkheim's sociology represents a Copernican revolution in terms of how we understand what a society is and what it means to be a person. His views are crucial for organizing and interpreting this ethnography of asphalt children. Moreover, they are crucial for revising the individualistic bias that grounds and guides so much of Western culture from jurisprudence to economics. David Emile Durkheim was born on April 15th, 1858 at Épinal, in Lorraine. His mother was a merchant's daughter and his father was the Rabbi of Épinal and was also Chief Rabbi of the Vosges and Haute-Marne that are regions of Lorraine in north-east France. Durkheim spent part of his early school years in a rabbinical school; his father, grandfather and great grandfather, had been rabbis. Surrounded by an environment organized around Jewish culture he studied Hebrew, the Old Testament, and the Talmud, while at the same time following the regular courses at the Collège d'Épinal where he had a short-lived mystical experience that led to an interest in Catholicism. At the age of thirteen, he had his traditional Jewish bar mitzvah.

Durkheim lived in an imperialist situation in France until 1870, September 1st. France was not just a monarchy but, like Brazil, it was an empire. The Emperor was Napoleon III, nephew of Napoleon I. Napoleon III was automatically proclaimed emperor one year after he was elected president in 1850 and he was in power until the Germans jailed him at the Sedan Battle. Before this chaotic situation, two parallel political movements were born: The Paris Commune in 1871, concentrated in the capital and with its foundation in Marxist ideas and, in the same year, the march on the Versailles Government, concentrated in the Palais du Louis XIV and defending the monarchy and conservative ideas. During that period, the Second Prussian Republic and Third French Republic were born in France – the first proletariat revolution, according to Marx. Marx and Engels discussed it in the introduction to *The Communist Manifesto*.

Durkheim always remained the combined product of an orthodox Jewish family, his experiences in Catholic school, and of that long established Jewish community of Alsace-Lorraine that, having been occupied by Prussian troops in 1870, suffered from the consequent nationalism and anti-Semitism of the French citizens. Durkheim viewed the Paris Commune of 1871 as senseless destruction and evidence of the alienation of the working classes from bourgeois society. The resurgence of nationalism and anti-Semitism convinced Durkheim that progress was not, as most positivists of the time had assumed, the necessary consequence of the development of science and technology, but on the contrary, an outcome of the growth of technology and mechanization that undermined society's ethical structures.

At that time, he was submerged in a social environment that was made up of a chaotic political scene and in his religiosity. Soon afterwards, he turned away

from all religious involvement, though emphatically not for lack of interest in religious phenomena. Rather, he became a freethinker, a non-believer, and an agnostic (Durkheim, 1912; 109):

Mais elle est avant tout, un système de notions au moyen desquelles les individus se représentent la société dont ils sont membres, et les rapports, obscurs mais intimes, qu'ils soutiennent avec elle..

In 1874 Durkheim obtained his Baccalauréat in Letters and in 1875 he obtained his Baccalauréat in Science at Collège d'Épinal. He was a great student and was awarded with a variety of honors and prizes. Because of this achievement, he was transferred to one of the French high schools, the Lycée Louis le Grand in Paris and this movement from Épinal to Paris changed Durkheim's perceptions about religion and the family, and indeed impacted his worldview. In his first three years in Paris, Durkheim prepared himself for the examinations that would open the doors to the prestigious École Normale Supérieure, the traditional training ground for the intellectual elite of France. However, his father's illness affected his studies and, after two unsuccessful attempts to pass the rigorous entrance examinations, he was finally admitted in 1879. Durkheim's generation at the École was a particularly important one in the intellectual life of France. Here, the socialist Jean Jaure became a life-long friend, along with the philosophers Henri Bergson, Gustave Belot, Edmond Goblot, Felix Rauh, and Maurice Blondel, the psychologist Pierre Janet, the linguist Ferdinand Brunot, the historians Henri Berr and Camille Jullian, and the geographer Lucien Gallois. In this social environment, Durkheim became an active participant in the high-minded political and philosophical debates that characterized the École. Léon Gambetta and Jules Ferry, whose anti-clerical educational reforms would soon lead to the national system of free, compulsory, secular education of the Third Republic, were figures that had some influence in his constant reconstruction of his worldview.

Durkheim's life inside the École Normale was marked by dissatisfaction. Some of his characteristics (for example, he was intensely studious and dedicated) created a new identity for him among his peers: the metaphysician. In this scenario, Durkheim was excluded by colleagues and teachers. In the eyes of the other students, his earnestness and dedication made him an aloof and remote figure. In the eyes of his teachers, this aloof and remote figure deserved no more than to be almost at the bottom of the list of successful aggregation candidates when he graduated in 1882.

Far greater than his professors, who irked and annoyed him, one of the influences upon Durkheim during these three years at the École Normale, involved the use of critical and rigorous methods in historical research as advanced by the historian Fustel de Coulanges.¹ Durkheim's approach to the philosophy of science, which stressed the basic discontinuities between different levels of phenomena and emphasized the novel aspects that emerged

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as one moved from one level of analysis to another, came from philosopher Emile Boutroux.² Coulanges and Boutroux were the main writers whose ideas would later show up as influences in Durkheim's landmark sociological studies.

In 1887, Durkheim was given responsibility for the course of Social Science and Pedagogy at Bordeaux. Not everyone was pleased by his appointment because he was a social scientist and the Faculty of Letters at Bordeaux was predominately staffed by humanists. At about the time of his academic appointment to Bordeaux, Durkheim married Louise Dreyfus and they had two children, Marie and Andre. Not much is known about his family life. Louise followed the traditional Jewish family pattern of taking care of family affairs and helping him in proofreading and secretarial duties; he devoted all his activity to his intellectual pursuits.

At that period, the value of sociology and of education was emphasized by Durkheim in his academic life. Subjects like kinship, crime, law, religion, incest and socialism were his major focus as a social science teacher in Bordeaux.

In 1896, Durkheim spent less energy on the history of socialism and put more effort into journalism, establishing a massive program of journalistic collaborations in Bordeaux. During this period, Durkheim took an active role in the campaign to exonerate Alfred Dreyfus, a Jewish man who had been falsely jailed in the midst of a spate of anti-Semitic acts.³ This act brought considerable criticism down upon Durkheim and in 1898 and, in the middle of this conflict, he founded the *Année Sociologique*, the first social science journal in France.

In this journal, Durkheim published some papers offering sociological views about some mathematical concepts such as space and time. In these papers, Durkheim showed that the dimension of space is not limited in its representation. He argued that space also has a material dimension and that must be studied. In 1899, Durkheim published a paper in this journal called "Social Morphology" where he defined this subject as being the science that studies the material substratum of society, not simply to describe it but to explain the form that societies assume when establishing themselves on the ground: the volume and density of the population; the way the population distributes itself, as well as the collection of social things that exist where the collective life of a society settles itself.

In the early years of the 20th Century, Durkheim became a professor and returned to Paris as a significant force in sociology and education. His course became one of the mandatory courses for those taking a degree in philosophy, languages, history or literature. Durkheim's ideas on "the science of morality" play an important part in my work. The idea antagonized the Catholics, and angered those on the political right; they were notably upset about his appointment to the Sorbonne. The second decade of the 20th Century was a

time in which he became recognized as an academic professional, as an activist political figure, and a sociologist.

His life ended soon after his son died. Andre, a linguist, was killed in the spring of 1916 in the war between Germany and Belgium. Durkheim was 59 years old when he died on November 15th, 1917, one year after Andre's death.

DURKHEIM, ROUSSEAU, AND SOCIAL THINGS

Durkheim carried out a critical reading of *The Social Contract* (1762; 2002), written by Rousseau. During 1901 and 1902, he gave many lectures in Bordeaux on the history of sociology. All that survives of them is a critical reading of "Rousseau's Social Contract" that was published just after he died. Here, Durkheim argued that Rousseau bridges the gap between state of nature theories and sociology and demonstrates how the science of sociology developed out of philosophy.

To undertake this critical work, Durkheim used history to show that a society does not have its origin in a social pact. Durkheim does not reject all of Rousseau's theories but he offers an explanation that is a very different from Rousseau's motto: to set aside the pre-conceptions. As Rousseau moves away from social facts and turns to the right politically, imagining a society that has its roots in the pact, Durkheim appeals to another contract notion that uses psychology to explain human association. This is the point at which Durkheim addresses the idea of the general will⁴ - *volonté générale*, by way of the idea of synthetic linking: "... toutes les volontés individuelles disparaissent au sein d'une volonté commune, la volonté générale, qui est la base de la société" (Durkheim, 1918; 2002)

Two sources of the contract and its legal institution, and consequently of will, were being reformulated. One states the universal (Rousseau) and the other the particular (Durkheim). The "contractualist" theory, Durkheim claims, demands that history express itself as the unfolding of the society and its social institutions. Politically, the refutation of the Social Contract is based on the institution of the government where the question of sovereignty is examined as well as that of the general will. Durkheim (1918; 2002) deals with sovereignty, the types of institutions that are typified through government and the state, through more of a social than a political plan. The recognized paradox for Rousseau in his *Contract Social* is presented in the choice of who governs: this is what Durkheim analyses. The contract, as conceived by Durkheim, has property as one of its constituent elements. It is this constituent which allows the concept of socialism to be reflected through the idea that there can be equality in ownership.

The notion of natural inequality is admitted by both the authors; indeed, the ways of discussing equality converge in some degree. In contrast, when they talk about society, the separation between Rousseau and Durkheim is realized.

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For the latter, it is a representation, while for the former, it is decay. However, softening the difference is the fact that Durkheim found in Rousseau the idea of organism and chemical synthesis and he brings that together with the contrasting idea that the human being has in its proper nature an embryonic or innate sociability and it civilizes itself. Language, reflection, agreement, knowledge, property are social things. This notion of social things is extracted by Durkheim from Rousseau's thought.

DURKHEIM, ROUSSEAU, AND SOCIAL BEING

State of Nature theorists, such as Rousseau, tried to work out what society is about by imagining what human beings would be like stripped from their social characteristics (in a "state of nature"). They put forward a picture of individuals in this state and tried to show how the needs of those individuals could explain their need for society. It is on this exact point that Durkheim disagreed with them.

Following Rousseau, Durkheim conceived of human beings as essentially social beings whose character, values, and very "nature" are dependent on the kind of society in which they live. To argue with individuals and try to work out how, through their characteristics, society can be explained, is very close to arguing that society is the result of adding individuals together - that society is the sum of its individuals. Durkheim maintained a different position, arguing that society is *sui generis*, an entity in its own right.

Common sense says that society is not real, only individual people are real and society is just a name for the individuals working together. This is a definition of social atomism⁵: the belief that society is no more than the sum of its parts. This method of science that theorizes from the individual has been called methodological individualism. Hobbes' state of nature theory is atomistic and a classic example of methodological individualism. John Locke, by contrast, imagines the state of nature as already a society of sorts. People in the state of nature already have a law to guide them. This law includes reason, recognition of mutual responsibilities and an ability to imagine ourselves in the other person's position.

The Rousseau theory, in some ways, is a development of Locke's and an attack on Hobbes' theory. Rousseau's theory starts from individuals who do not have the developed social faculties that exist in Locke's state of nature, but he ends up with a society that is more than the individuals added together.

There is another way to say that society is more than the sum of its parts: social holism. Rousseau (1762; 2002) argues that when individuals come together to form society, something magical happens: a new will is formed. Quoting Rousseau, Durkheim (1918/2002: 15) says that society is:

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... un être moral qui a des qualités propres et distinctes de celles des êtres particuliers qui la constituent, à peu près comme les composés chimiques ont des propriétés qu'ils ne tiennent d'aucun des mixtes qui les composent. For Rousseau, Durkheim (1918/2002: 16) says: ... la société n'est rien si elle n'est pas un corps un et défini, distinct de ses parties.

Durkheim recognizes that the social order is an order of facts that are generically different from purely individual facts. He started with societies and deduced from them the social properties of individuals. He did not start with individuals. According to Durkheim society is real and not something that emerges from the interaction of individuals. For Durkheim human beings are social and the individual is given by social forces acting on and with the biological organism.

DURKHEIM AND THE SOCIAL SELF

The sociological conception of self has been variously named and conceived: Homo duplex by Durkheim, the looking glass self by Cooley, the I-Me-Generalized Other model by G. H. Mead for example. The basic idea is that society (with all its symbolisms) somehow gets inside your head whether you want it or not. It just happens as a consequence of socialization. We humans come onto the evolutionary stage already, always, and everywhere social.

The Homo duplex concept is the key to understanding the origin of the duality of human nature, as expressed in the human's image of being divided between body and soul, the constitutional split that isolates and opposes two distinct worlds (Durkheim, 1914/2002: 09):

... l'homme serait double parce que en lui se rencontrent deux mondes: celui de la matière inintelligente et amoral, d'une part, celui des Idées, de l'Esprit, du Bien, de l'autre. Parce que ces deux mondes sont naturellement contraires, ils luttent en nous, parce que nous tenons de l'un et de l'autre, nous sommes nécessairement en conflit avec nous-mêmes.

Here Durkheim points to two worlds. On the one hand, there are the emanations of the organic base, the sensations and the egoistic appetites that are strictly individual. Without denying this assumption, it is clear from more recent research that social factors can and do impact and "socialize" the biological. On the other hand, the activities of the spirit, the conceptual thoughts, and the moral actions that are necessarily universals. This formula of Homo duplex evidences a double gravity centre to the interior life (Durkheim, 1914/2002: p06):

... La vieille formule Homo duplex est donc vérifiée par les faits. Bien loin que nous soyons simples, notre vie intérieure a comme un double

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centre de gravité. Il y a, d'une part, notre individualité, et, plus spécialement notre corps qui la fonde⁶; de l'autre, tout ce qui, en nous, exprime autre chose que nous-même.

In this process, the human being is born with society in his/her head; the biological – genetic - possibility for the self is discarded as a simple uncompromised causal nexus. This separates sociology from the psychological tripartite (Id-Ego-Superego) self. In the different schools of psychology, the self assumes a certain form in the first years of life. In sociology, the personality is already formed, and consists of I (I-statements) and Me (They-statements based on reflective comparisons). The model I-Me, from George Mead (1934/1967: 178-79), expresses sociology's position:

The self is not so much a substance as a process in which the conversation of gestures has been internalized within an organic form. This process does not exist for itself, but is simply a phase of the whole social organization of which the individual is a part. The organization of the social act has been imported into the organism and becomes then the mind of the individual. It still includes the attitudes of others, but now highly organized, so that they become what we call social attitudes rather than roles of separate individuals. This process of relating one's own organism to the others in the interactions that are going on in so far as it is imported into the conduct of the individual with the conversation of the "I" and the "me", constitutes the self.

Durkheim (1914; 2002), seeking to establish sociology as an independent discipline, defined psychology as the study of individual consciousness and sociology as the study of collective consciousness.

For Durkheim, human beings are social and dual. The desires of their biology are satiable and limited but the desires engendered by society are variable and potentially unlimited. The relationship between the Homo duplex and society is not that of a social template transfixing a passive imprint. Rather, the Homo duplex stands back from the social order and assesses the justice of the existing division of labor and rewards.

DURKHEIM AND THE DIVISION OF LABOUR

Durkheim (1893/2002, V.1: 66) acknowledges that Comte was the first to have recognized, in the division of labor, something other than a purely economic phenomenon: "De tous les sociologues, à notre connaissance, il est le premier qui ait signalé dans la division du travail autre chose qu'un phénomène purement économique." According to Comte (1853/2002), the division of labor is one of the factors that links the human being to his fellows. There are three factors to promote this link: language, religion, and the division of labor. These

three factors constitute social statics, the study of the conditions and pre-conditions of social order.⁷ Social statics and social dynamics are the two dimensions of social action in society and of the sociological analysis of society.

The division of labor, according to Comte, creates social solidarity by awakening in each individual a sense of dependence on others, but it also generates new social divisions between classes and between the private and public domains. Comte sees the division of labor as a powerful impulse of social evolution and social integration. An independent, governmental organ (i.e. the state as informed by the positive philosophy) is necessary to realize and maintain social unity, or social solidarity.

Durkheim supports Comte's argument that solidarity already presupposes the spontaneous existence of society but rejects the efficacy of government regulation of the economy; for him, the problems afflicting economic institutions arise from a multiplicity of particular circumstances of which only those closest to those problems have any knowledge. He rejects Comte's premise that, as with all organisms, the unity of society was to be obtained by the "spontaneous consensus of parts".

According to Durkheim, the division of labor is another specific dimension by which we can explain the existence of kinds and types of social organization in a given society. Durkheim's vision of the division of labor is of a naturally occurring reality that becomes a force for social cohesion and solidarity, binding individuals in society more closely together and possibly interfering with individuality as a result.

Durkheim, in *De la division du travail social*, explains both the nature of society as well as the meaning of, development of and place of individuality within that structure. He tries to show that societies are real in the sense of having properties similar to material objects. The word "tissue" brings the idea of substance linking people together (Durkheim 1893/2002, V. 2: 47) :

... de même qu'une colonie animale dont tous les membres sont en continuité de tissu constitue un individu, tout agrégat d'individus, qui sont en contact continu, forme une société. La division du travail ne peut donc se produire qu'au sein d'une société préexistante.

In the same work, Durkheim argues that society is an organism before the division of labor takes place. Individual people do not come together to form a society in which they are the different parts. Instead, pre-existing society develops parts with distinct functions. The society comes first, the separate parts next and these parts are linked by solidarity.

According to Durkheim, the solidarity of society is a kind of social glue that holds the society together, as an invisible tissue linking the members, and the division of labor starts with the differentiation of organisms studied in biology.

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The biological organisms are hierarchically constituted from the most simple and common organisms at the base of the evolutionary tree to the most complex and differentiated organisms that are at the top. Durkheim's vision is of the same process continuing in the development of human societies.

In 1776 in *Recherches sur la nature et les causes de la richesse des nations*, Adam Smith (1776; 2001, V.1:17) made the following observation:

... The greatest improvements in the productive powers of labor, and the greater part of the skill, dexterity, and judgment, with which it is anywhere directed, or applied, seem to have been the effects of the division of labor.

In 1893, almost one century later, in *De la division du travail social*, Durkheim says that social science was ahead of the natural sciences in this respect, because it was only after Adam Smith analyzed the division of labor in society that biologists analyzed it in terms of biological organisms: “Quoique la division du travail ne date pas d’hier, c’est seulement à la fin du siècle dernier que les sociétés ont commencé à prendre conscience de cette loi... Adam Smith est le premier qui ait essayé d’en faire la théorie” (Durkheim 1983/2002, Vol. 1: p. 47).

According to Smith, individuals are held together by the economic advantages of the division of labor. This association appears because, by each playing different parts in the production of economic goods, individuals produce more. Smith imagines individuals having a natural propensity to exchange things with one another.

In *De la division du travail social*, Durkheim agrees with Smith that the division of labor comes about by a natural process – it is not a product of human design - but he does not agree that the natural process is the hidden hand of the market guiding the selfish desires of individuals. Underneath the self-seeking of individual ends, Durkheim sees a pre-existing unity of purpose, a bonding of the individuals together into the social organism that pre-dates the differentiation.

DURKHEIM AND SOLIDARITY

Durkheim views society as being based in two types of solidarity: mechanical and organic. Mechanical solidarity is the basic solidarity that makes society an organism rather than just a pile of parts; and organic solidarity is the social glue – an invisible tissue linking the members – that comes from the division of labor. The division of labor in society is a separation of its parts and there is a paradox in an organic solidarity. Durkheim argues it is a strengthening of the bond between the parts. It is with this paradox that *De la division du travail social* started.

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To understand how the individual, while becoming more autonomous, depends more upon society and how the individual can be at once more individual and more social is to understand the contradiction, because they develop in parallel fashion. Durkheim argues that the nature of solidarity is being changed as society becomes more divided. Individuality and the division of labor are, in fact, the result of society's need for a new form of solidarity – organic solidarity. At the same time, he continues to argue that the division of labor within modern society is much broader than a purely economic issue.

This differentiation of functions is a solidifying agent. That is to say, society is becoming more and more differentiated – people are specializing more and more – but as people become more different from one another people grow closer together – in an organic sense - rather than further apart.

According to Durkheim (1893/2002, Vol. 1: 81) common beliefs and practices – which are the characteristic of mechanical solidarity – are therefore the fundamental glue of all societies:

L'ensemble des croyances et des sentiments communs à la moyenne des membres d'une même société forme un système déterminé qui a sa vie propre; on peut l'appeler la conscience collective ou commune.... elle est indépendante des conditions particulières où les individus se trouvent placés; ils passent, et elle reste ... elle ne change pas à chaque génération, mais elle relie au contraire les unes aux autres les générations successives. Elle est donc tout autre chose que les consciences particulières, quoiqu'elle ne soit réalisée que chez les individus.

Durkheim (1893/2002, Vol. 1: 74) defines the concept of the conscience collective as "... l'ensemble des similitudes sociales, sans préjuger la catégorie par laquelle ce système de phénomènes doit être défini. " Organic solidarity develops out of mechanical solidarity. In this sense, the society makes us individuals – with the development of organic solidarity – rather than individuals making society – as state of nature theories suggest.

Durkheim argues that societies are not so much the product of individuals as individuals are the product of society. In mechanical societies, human beings were not individualistic in the way they are in organic societies. The individual has evolved in the course of history. This has not happened because society has fallen apart, but because individualism provides a new and powerful way of holding society together. The link between both solidarities is clear for Durkheim - they coexist - and the organic solidarity takes a different form from the mechanical. De la division du travail social states explicitly that the study of solidarity concerns sociology; it is a social fact which one can know only by studying its social effects.

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DURKHEIM AND THE SOCIAL FACT

Durkheim distinguishes social facts, which he sometimes described as “states of the conscience collective” from the forms these states assumed when manifested in the private, conscience individuel. This distinction is most clear in cases like those treated in *De la division du travail social* such as customs, moral and legal rules, and religious beliefs. In these cases, existences that are independent of the various actions they determine are clear. It is considerably less obvious, however, where the social fact in question is among those more elusive currents that are reflected in lower or higher birth rates, migration, suicide rates, or emergent social and cultural groups.

According to Durkheim, the cause of social facts is to be found among antecedent social facts and not individual minds. However, on the other hand, Durkheim affirms that everything that precedes applies to the determination of the function, as well as of the cause. The function of a social fact can only be social; it consists in the production of the effects that are socially useful and can serve the individual at the same time.

Durkheim does not deny that such individual manifestations are in some sense social for they are indeed manifestations of states of conscience collective; but this is precisely because they also depend, in part, on the psychological and biological constitution of the individual, as well as the particular circumstances. Durkheim reserves for them the term *socio-psychique* suggesting that they might remain of interest to the sociologist without constituting the immediate subject matter of sociology.

The external coercive power of social facts is derived from their being held in common by most of the individual members of a society; and that, in this sense, the characteristics of the whole are the product of the characteristics of the parts. The obligatory, coercive nature of social facts, Durkheim argues, is repeatedly manifested in individuals because it is imposed upon them, particularly through education; the parts are thus derived from the whole rather than the whole from the parts.

Invoking a distinction introduced in *De la division du travail social*, Durkheim insisted that social facts were not simply limited to ways of functioning (acting, thinking, feeling, etc.), but also extended to ways of being (including the number, nature, and relations of the parts of a society, the size and geographical distribution of its population, the nature and extent of its communication networks).

In brief then, social facts should be treated as things.⁸ He then proposes a sociological method to do so through a fundamental rule: “...traiter les faits sociaux comme des choses. ... Les faits sociaux doivent être traités comme des choses parce qu'ils sont les data immédiats de la science, tandis que les idées, dont ils sont censés être le développement, ne sont pas directement données” (Durkheim, 1984/2002: 2).

DURKHEIM AND SOCIOLOGICAL METHOD

In *The Rules of Sociological Method* Durkheim shows that sociology is the study of society and that society has real substance. Social reality is as real as a physical object; it is not just an idea in our head. In this work, Durkheim affirms a need for a distinct science of society – sociology. Durkheim’s main argument is that even the subject is founded in the social orientation⁹; there is “not enough” from the science of psychology and biology.

In *De la division du travail social*, Durkheim argues that “sociology” is a science, which, like biology, studies the phenomena of the natural world and, like psychology, studies human actions, thoughts, and feelings. One year later, Durkheim conceived of sociology as the scientific study of a reality *sui generis*, a clearly defined group of phenomena different from those studied by all other sciences, biology and psychology included. It is for these phenomena that Durkheim reserves the term social facts in *The Rules of Sociological Method*:

Since these facts consist of actions, thoughts, and feelings, they cannot be confused with biological phenomena; but neither are they the province of psychology, for they exist outside the individual conscience. They constitute a new species and they must be exclusively assigned the term ‘social’. This is appropriate, because it is clear that the individual is not their substratum: they are grounded in society, either political society in its entirety or one of the partial groups that it includes. Moreover, it is for these ‘facts’ alone that the term is fitting, for the word ‘social’ has the sole meaning of designating those phenomena which fall into none of the categories of facts already constituted and labeled. In Chapter V of *The Rules of Sociological Method*, Durkheim (1894/2002: 73) describes some rules for the explanation of social facts and affirms that:

... la contrainte la caractéristique de tout fait sociale. Seulement, cette contrainte ne résulte pas d'une machinerie plus ou moins savante, destinée à masquer aux hommes les pièges dans lesquels ils se sont pris eux-mêmes. Elle est simplement due à ce que l'individu se trouve en présence d'une force qui le domine et devant laquelle il s'incline ; mais cette force est naturelle. Elle ne dérive pas d'un arrangement conventionnel que la volonté humaine a surajouté de toutes pièces au réel; elle sort des entrailles mêmes de la réalité ; elle est le produit nécessaire de causes données.”

It is not necessary, therefore, to resort to deception to induce the individual to submit to it absolutely of his own free will. In this chapter, Durkheim argues that it is sufficient to make him aware of his natural state of dependence and inferiority. He also argues that through religion the individual represents this state to himself via the senses or symbolically; through science the individual arrives at an adequate and precise notion of it.

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According to Durkheim, the superiority that society has over the individual is not merely physical, but also intellectual and moral; it need fear no critical examination, provided this is fairly undertaken. He suggests that reflection – which causes humans to understand how much richer or more complex and permanent the social being is than the individual being – can reveal the reasons that make comprehensible the subordination which is required of humans and the feelings of attachment and respect which logic – the rules that the mind should follow in order to arrive at truth – has implanted within h/er.

DURKHEIM AND LOGIC

In the conclusion of *Les Formes Élémentaires de la Vie Religieuse* Durkheim showed that logical thought has social origins and concepts are the basic material used to construct it. Therefore, Durkheim made a sociological analysis of logic that gives tools for making a sociological analysis of abstract things.

He suggests that to search for how the society could have played a role in the development of logical thought is the same thing as to search for how it can have taken part in the formation of concepts. Many concepts have individual objects and Durkheim develops this argument when he affirms that these concepts are, generally, rather crudely formed. This raises questions about whether scientific concepts are perfectly adequate to describe their objects. In this regard, the author affirms that our ‘non-scientific’ concepts and scientific concepts differ only in degree. He suggests, therefore, that the concept, scientific or not, must be defined by other traits in the tangible representations of any order – sensations, perceptions, or images.

Durkheim strengthens his argument by drawing upon the systems of the concepts that we use more frequently – the vocabulary of our ‘mother tongue’ – and showing how, as it changes slowly, it changes established ways of thinking. He reminds us that we can “think” an object, whether it is present or absent, without “naming” the object; but that, particularly when the object is absent, the thought becomes more difficult, that is, the memory of the object requires an effort, and even then represents only a part of the experience of the object itself. Here, the sign performs a valuable service; although it does not relieve us of the need to think the object we express, it does relieve us of some of the operations necessary to make the complete thought. The sign immediately recalls the thing without our having to laboriously reproduce the complete object in memory. For Durkheim, these representations – social facts – such as language, signs, and symbols make sense only according to one social and historical context that is precise and denotes their position as a part of a whole set of relations.

Durkheim argues that the concept is essentially both an impersonal representation because it is common to all (as a tool to promote communication among human intelligences) and a collective representation,

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because it is the work of the community that has no imprint of any individual intellect even though it is constructed by a single intellect in which all the others meet and recognize themselves. Mead expresses this idea in his paradigm of the I, the me, and the generalized other.

The nature of concepts reveals their origins as social. To think logically – remembering that its basic material is concepts – is to think impersonally, that is, to think collectively. Because the concept is a collective representation, Durkheim concludes that concepts are the way that society conceives things, that is, conceptual thought is contemporaneous, and refuses to see the society as the product of modern culture.

Concevoir is not généraliser. It is not only in the less technologically developed societies – which have only developed generalization, and the notions they use are generally not well defined – that concepts lack clear definition. Most of our present concepts also lack clear definition; they are defined only when we are cornered to do so – when the discussion appears with this objective and when they are operated on by the scientist.

Society is not illogical or alogical, inconsistent or changeable. Here, the manifestations of the collective conscience are at their highest level in the social life of the mind. It is a conscience of consciences. Logic is always present in society and it is necessary to search out both the different and the similar characteristics that logic presents in different historical moments. Some categories are concepts – collective representations – and they have a preponderant role in knowledge. This is because they are instituted by society and because their content includes various aspects of the social being. These categories are: genus, time, space, personality, and causality.

THE REALITY OF SOCIETY

The work of Durkheim has one major theme: that society is real and that the reality of society is the subject matter of sociology. He explores different aspects of this theme in his different works. The reason for this extended review of his ideas is that they are the theoretical ground on which the research reported here rests. Moreover, Durkheim is not merely a classical voice whose importance is merely historical. He solved many problems that those who have forgotten or displaced him continue to struggle with. There is, however, always a danger when we hook our wagon to a star – to an icon of our field – for example Einstein in physics, Foucault in history, or Marx in political economy. The danger is multiple: we must confront the challenges of translation in some cases, and more often the conflicting interpretations among readers; we must be alert to the threat of the anachronistic. And we must, finally, be cautious about falling prey to hero worship. All of these dangers confront us when we tie our wagon to Emile Durkheim.

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The rationale for doing this is that we postmodern ones are still, in a very real sense, in the world of classical social theory, still the students of the era that produced Marx, Weber, and Durkheim – we are not yet their children. Sociologists in particular are still followers and leaders in Durkheim's ways. He has much to teach about what sociology is in the first place, and many resources at his disposal that can be useful to address the flaws and fallacies concerning the nature of objectivity that exist in postmodernism. So if we make ourselves Durkheimian here, we do so with sufficient self-consciousness to keep the dangers mentioned above in the forefront of our thoughts. Durkheim is invoked in the anti-essentialist spirit of this work. Indeed, the classical tradition in social theory, as it unfolds from the 1840s on, is in fact a movement to reject immanentism, and psychologism, and transcendentalism.

Durkheim discusses the source of the experience that religious feelings are "outside" of us or emanating from within us as a spiritual voice, the voice of the soul through which God speaks to and guides us. He thus identifies the origin of the sense of transcendence and immanence. This still confuses some of our most imaginative, intelligent, and creative intellectuals and scholars, for it is a consequence of not recognizing the social level of our existence, society *sui generis*.

The continuing defense of Platonic mathematics is founded on the same basis; mathematicians and logicians who cannot ground their experiences, who insist upon the certainty and indubitability of their results, locate them outside of society, history, and culture. The general problem here is the problem of the locus of abstract concepts. Durkheim deals with this by linking the sociological grounding of religion and the gods with the sociological grounding of logical concepts.

It is important to stress that Durkheim does not deny the reality or the significance of the experience of transcendence. People really do have experiences that come from "out there." The problem is that the "out there" surrounds them; it is society, and not some extra-sociocultural, -historical, or -material realm. There are no transcendental, supernatural, supranatural, or other trans-material realms.

The reality of society is an ensemble of invisible relations, those very relations that constitute a space filled with positions in relation to each other and defined by their proximity to, neighborliness with, or distance from each other, and also by their relative position, above, below or in between, in the middle. We are creatures bound to each other through belongingness and compassion on the evolutionary stage (King, 2007).

Let's establish one of the important consequences of Durkheim's analysis of logic and abstract ideas. Mathematics is present in all cultures as techniques applied to solve problems, in a dialogical movement between the two basic forms that problems take: traditionally, these forms are considered concrete and abstract. Both types embody social problems. It is an exercise to show how

mathematics is a social construction and how it is a constructor of the social. Giving a focus to the sociological materialism of mathematics offers a way of making the mathematics of everybody visible and accessible to everybody. As we are a complement of each other, our mathematics is a complement of the mathematics of the other. It is important to realize immediately that the distinction between concrete and abstract is really a distinction between two different kinds of concreteness. A materialist sociology of abstraction reveals it to be the form of concreteness found in highly professionalized intellectual work. We must escape the idea of “abstractions,” an idea that is a companion and surrogate for “purity;” and wherever we find the “abstract” and the “pure” there also we find the danger of falling into the trap of believing in supernatural and transcendental realities.

Basic Concepts: How and Where are They?

While practicing as a teacher-learner in the city of São Paulo certain concepts revealed themselves to Mônica as basic. As Mônica’s contacts with the asphalt children “in locum” increased, and she came to know more and more about their actions, her awareness of the existence of structural concepts within the sociological analysis of mathematics emerged from the complex interconnectedness of their own actions. These structural concepts will be brought to light in this chapter.

Cultural identity, self-governing, corporification, identification, and multicultural racism are concepts that need to be discussed in terms of how they are understood from our collective standpoint, and from within Mônica’s assumed research role. Increasingly, that role came to be guided by the principles and findings of the sociology of mathematics and ethnomathematics. The basic qualities of these concepts were emphasized on two occasions: while observing the social practices of the asphalt children, and while analyzing the data of those observed moments. These concepts are highly complex, interconnected by invisible nets that exist within the social practices of the children in street situation to the extent that they inform and constitute themselves, that is. coexist, within the social practices of these children.

CULTURAL IDENTITY AND SELF-GOVERNING

Different societies around the world have different rhythms and ways of being that are constructed according to many social facts; for example, the prevailing model of urbanization and production, systems of communication and the power structures that circulate. To share is a necessary action that must be taken in any society where knowledges (as in languages, systems of explanation, myths and cults, cooking and customs) are socially created, according to the survival needs of that society. These knowledges are in

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constant movement, being re-created by intelligent lives to give support to the movement of that society. Knowledge is both a collective representation and a category of selection inside of society. To make compatible and to subordinate are the actions that are necessary to recognize in any society in order to understand that the behaviors are socially developed, according to the rules and regulations – with their margins of flexibility - of that society. These behaviors are in constant movement, being recreated by intelligent lives to structure the movement of society. They are a collective representation and a model inside of society.

The actions of sharing knowledge and making behaviors compatible are synthesized as characteristics of a culture (D'Ambrosio, 2001a). Cultures are in constant transformation, being influenced by the cultural dynamics that are deeply embedded through social facts such as the politics, economics, and religions within any society.

The concept of culture is intrinsic to society because the movements of society are the central objects of this concept. We need to understand better how knowledges are shared and behaviors are made compatible and subordinated. In order to provide a context for understanding the lives of the asphalt children we must follow these movements. Looking to the social and historical context of the cultural identities and the self-governing of the human being is looking to the asphalt children as social beings.

Cultural identity and self-governing are deeply connected in this discussion because of the close connections and the complexity of their interrelations. Therefore, to talk about culture is to talk about self, and seeing the self as a social structure. The history of the human being that focuses upon its cultural world has been dealt with in many works. Restivo (1991) offers a critical historical view of the image of the self and discusses the self as a creator, agent, and product of society, culture, and sociocultural change. "Some notion of 'self' is necessary to account for the individual's experience of unity and continuity in him or herself and others" (Restivo, 1991: 99). Before the emergence of the social sciences, conceptions of the self ranged from metaphysical and theological ideas about the soul to views of the human being as a collection of somative sensations. The social perspective about self could only arise at the moment when the dominant view of human nature was brought down by the Enlightenment. Clifford Geertz (1973; 1989) and Stuart Hall (1992; 2001) rely on critical historical construction to demonstrate that Enlightenment thinking has a uniform perspective on societies, where the essential centre of the self is the identity of a human being. Classically, and in general it was thought that the identity of the self was born with the human being and remained essentially the same - continuous or identical - during his/her existence. Essentially, the massive and wide variety of differences among human beings, in beliefs and values, in habits and institutions, both in time and from place to place, is without significance for the

conception of the human being during this period: - an individual totally centered, unified, gifted with capacities of reason, conscience, and action. On the way to a more social/sociological view of the self, we arrived at the notion of the "sovereign individual" in the context of a growing criticism of the "sovereign state" and "sovereign monarch."

Between the Humanistic Renaissance of the sixteenth century and the Enlightenment of the eighteenth Century, the birth of this "sovereign individual" 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.

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 exterior – the cultural world – 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 the other human beings that mediate the values, senses, and symbols of the worlds that she/he inhabits. These thoughts were based on the introspective analysis of the human being and his/her mental process by the interactionists in the late nineteenth century, who began to explore the self from a cultural perspective.

Symbolic interactionist approaches, keystones of this new conception of the human being, stressed this interactive conception of the identity and of the self but at the same time 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 a prediction so that the self and the cultural worlds co-exist through identity, where identity becomes the basis of the human axis.

The unity and structure of the self reflect the unity and structure of the world in which the person lives. 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 (1992/2001), identity becomes identities and these identities of the human being are sometimes contradictory and thus remain unresolved. The process of identification, through which the human being projects 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. Marx's observations on the alienation of the workers, and Weber's more general concern with the alienating effects of rationality and bureaucracy, were among the first signs. According to Durkheim (1912/2002: 2), 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 "individual being". The other is a system of

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ideas, of feelings, and of habits that is expressed in ourselves, not through our individual personality, but through the group or the different groups that we are inside: religious beliefs, beliefs and their moral practices, professional or national traditions, the collective opinions of one gender. In other words, we are the groups we encounter as our lives unfold. Some of these groups are more central than others in terms of our identities, and their centrality can vary over time.

In the second half of the twentieth century, while the self is being decentered social scientists are working to distinguish and theorize “social” and “cultural.”¹⁰ The links between self, social, cultural, and sociocultural changes are in vogue, and the clarity of such concepts enables, according to Geertz (1973; 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. Embedded in this dialogical approach to the self, the social and the cultural is a way to theorize the relationship between society, culture and mathematics. We come therefore to the view that the human being has no fixed, essential, or permanent identity. According to Hall (1992/2001), the identity is formed and transformed continuously in relation to the forms in which he or she is represented or interpreted in the social and cultural surroundings. Identity is historically rather than biologically or theologically defined. Here, the self assumes different identities in different moments and places, or more precisely, in different times and spaces.

Many factors could be considered relevant to this concept of the human being. One of the most important factors is contained within “Freud e Lacan, Marx e Freud” (1964/1976; 1985) – a Brazilian edition of two texts by Louis Althusser. The author points out that Marx’s and Freud’s works modify the cultural worldview when the conditions previously recognized as normal are rediscovered anew. His studies are based in his re-reading of Marx’s work and in the re-reading of Freud’s work by Lacan - which inspired this interpretation of his work. This renewal that is present for Marx and Freud 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 true from the real.

By the end of the twentieth century, social and the cultural values in all their varieties have been shaken, challenged, and experienced stresses and tensions. The self appears as a social and cultural construct in constant movement. The self, in these terms, is fragile. This fragility can be approached by way of the concept of open systems. Open systems are systems which exchange energies across their boundaries. The social and cultural environment in which the

SOME SOCIOLOGICAL “IMAGES & ACTIONS”

human being is socialized - or programmed - determines the extent to which he or she will behave in ways that appear robot-like or in ways that reflect independence and uniqueness.

In terms of open systems, we can look within social and cultural environments as a way to offer alternatives and encourage individual choices that are bounded by constrained cooperation, decency, and dignity. In addition we want to focus on promoting the abolition of the situations in the street spaces of the city of São Paulo in which children are used as instruments in violation of their interests. Self-governing is conceived of as the main way to make places that can be occupied by cultural identities. To share knowledge and to make compatible behaviors it is necessary to self-govern, it is necessary to decide in favor of listening, seeing, feeling, participating, and acting, and it is necessary to choose not by imposition but through agreements. To achieve this it is necessary to know what is ethical and where is the power that is inserted into these agreements. We must focus on their external faces and observe their effects. We cannot meet our objectives by interrogating the internal motivations of social agents. Rather, we must know about the existence of a centre of power and of ethics and consider that both could be withheld by someone, institutionally. Ethics and power appear as crucial articulators in the capacity of the human beings to decide by themselves. Here we do not mean “decide” or “choose” in some magical unsocialized sense. Rather, we mean to decide or choose without the salient presence of constraining forces in the form of real representatives of, for example and most importantly, the state or religion. We distinguish here between the reality of freedom and the myth of free will.

CORPORIFICATION AND IDENTIFICATION

Power and ethics coexist within the dynamic process of human development as social practices; they permeate the self-governing and the identities of the human being in this dynamic process. Many theorists have discussed the concepts of power and ethics over a long period of time and their discussions have taken many directions. Here we concentrate on interpretations about the relationships between mathematical knowledge, power, ethics, and body. The body, here, appears as a social-cultural fact that is always in social movement and never exists as a complete and independent structure in and of itself. In other words, the body is treated in the same way as Mead treats the social self. The analyses of power and ethics emerge from domination strategies where they implant themselves and produce real effects through the body. To work with these ideas, we rely on the concepts of the disciplined body, focusing on corporification, and the place of the body as advanced by Michel Foucault and the social formations and attitudes of body as advanced by Slavoj Žižek. This grounds the focus on identification.

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Foucault (1978/1994: 470) proposes to understand 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.

An important objective of the powers-that-be (of power) is to clean the city and “to put each one in its place”. Power occupies and delimits space, creates and discloses rules and patterns, looking to standardize the city, using strategies to control the bodies, to watch them and mainly to exclude them by creating marginal spaces, such as places of segregation and social exclusion. Those boundaries, the spatial demarcations, classifications and organizations are strategies of power, are reality that is experienced, are lived spaces.

The space, or spaces, claim(s) a decisive character within the relations of the human being (Santos, 2006, p114):

... o papel o 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.

In that sense, the concept of corporification was developed in this research to categorize the action that locates the place of the physical (collective or individual), mind (knowledges), or institutional (juridical or political) bodies. The focus here is on the spatial demarcation of these bodies, the transformations of the social relations in the spaces within which these bodies act, and the order of the social things linked with these bodies.

In post-modern society, these strategies of power are based on many rules and regulations in the name of our well-being. An actual order of things, the world order, is Real; the Real, here, is not the means to the reality experienced by the social agents of the society, it is rather the key to maintaining the hegemonic systems via the strategies of power. Being undifferentiated within itself, it is in systems terms more closed than open.

Slavoj Žižek (1998) relies on the concept of identification throughout most of his works to explain the relationships that exist between the strategies of power and what we refer to here as “a global ethics.” In a socially structured body where each part occupies its space, the existence of non-parts puts in checkmate 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. However, on the other hand, the identification of non-parts within the particular is characteristic of the depoliticization process and helps to maintain the condition of being excluded.

A global ethics centres on human rights (actually the main voices of the non-part body – of the excluded) as positioned within particular interests. The body here, conditioned under the global ethic, is the singular universal.

The singular universal is a group that, although without any fixed place in the social edifice (or, at best, occupying a subordinated place), not only demands to be heard on equal footing with the ruling oligarchy or aristocracy (that power) but, even more, presents itself as the immediate embodiment of society as such, in its universality, against the particular power interests of aristocracy or oligarchy (Žižek, 1998, online). The body is controlled as a strategy of power to occupy and delimit spaces and the body is, at the same time, manipulated as a strategy of the global ethic to maintain the elitist spaces. The relation between power and body is linked with the process of pleasant submission where duty becomes pleasure. The relation between ethics and body is linked with political correctness where pleasure becomes duty.

The interrelations between power, ethics, and 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 treacherous hold upon the body, a hold that simultaneously relies upon and produces knowledge (including mathematical knowledge). Both concepts are manifest in the mathematical knowledge relations that are conditioning the emergence of the human being by focusing on the body. The body passes through this process with the intention of becoming, itself, able to participate in economic activity where the terms are of uninterrupted subjection and to the detriment of its potential for plea and revolt:

Se forme alors une politique des coercitions qui sont un travail sur le corps, une manipulation calculée de ses éléments, de ses gestes, de ses comportements. Le corps humain entre dans une machinerie de pouvoir qui le fouille, le désarticule et le recompose. (...) La discipline fabrique ainsi des corps soumis et exercés, des corps "dociles" (Foucault, 1975; 2001, p73).

The body here is fragile. It appears targeted and produced by the hegemonic system and then becomes unknowable outside of its cultural significations; social and historical forces directly construct the corporeal reality of the body. However, it is important to stress that the mechanisms of power and the global ethic discussed here are not reducible to repression. Power and ethics are not only negatively linked in this vision. If the mechanisms of power and the global ethic were exerted only in a negative way they would be very fragile. If it is strong it is because power and ethics produce positive effects at the level of the wish, of obligation and of knowing. From the wish, an obligation and a knowing over the body there arose physiological knowing, an organic knowing.

If it is possible to constitute a wish, an obligation and a knowing over the body they have happened by means of related disciplinary links that are

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promoted by institutions such as church, school, and army. The teaching of mathematics, as it is working in the school, is an important support to maintain the hegemonic system that is targeting and producing bodies. The non-recognition of mathematical knowledges from others as valid, apart from the scholarly or academic culture, is a very clear example of the totalitarian force that uses power and ethics to exist in these times. To understand the enrolled subjection in the relationships between mathematical knowledge, power, ethics, and body that are not centered upon the obedience paradigm but are dispersed through the social body, we – and especially Mônica as the on-site ethnographic eye - observe the constitution of the body in certain spaces, the control and the manipulating relations that occur inside of the process of constitution, the interactions of the body in the space, and the concrete effects that these interactions produce in certain spaces. To understand this observation process, it is necessary to profile the importance of dislocating the focus to the outskirts of the zone (since this outskirt is actually at the centre), to the extremities of the social body, to the local institutions, apart from the law, and to the rules, in order to observe the techniques of intervention by power and ethics in the productions, and to observe the material effects that are produced over the bodies.

MULTICULTURAL RACISM

Multiculturalism is present in the post-modern world. Technological progress brought to the human being the possibility of being in different places for a short time and, sometimes, the possibility of being in many places at the same time. We start by giving some examples in a global sense. That is, we observe where and when the human being is inserted into elitist spaces, usually in urban centres, and has financial support to use (and to be in) the technological process. In the universal sense, technological progress has brought the necessity of the human being to survive into elitist spaces. The social thought “money” is present in both cases and this thought puts the human being inside the post-modern dialogue, in the reality experienced of the human being in the occident; in one case this thought appears as product and in another it appears as production.

According to Žižek (1997), multiculturalism is the ideal form of the ideology of planetary capitalism. Ethnic property and communitarian identity are “reterritorialized” to the force and brought to their knees; thus, Capitalism (again, as the ideology and myth of an economic system that has no social-material viability), in which multicultural tolerance is a basic 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. “Respected” is placed 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 the multiculturalist maintains a distance made possible by a 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, s/he doesn't oppose the other's particular values), but nevertheless 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, 1997; 2002, online).

Žižek alerts us to the danger of reactionary and conservative multiculturalism, of racist multiculturalism. The respect and the tolerance for 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 his or her culture, multicultural tolerance lingers and the imposition of occidental values is promoted through "democratic" values, as in freedom and equality. Democracy (camouflaged by technological knowledge, ruled by power, and in the name of the ethos) is present as a totalitarian system in the meetings between cultural groups, "well" structured in name, especially by 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.¹¹

The process of the "word without word", of theory in opposition to practice, is linked with market logic, with the non-political and, as such, it is far from social freedom and social equality. They are based in social agreements and supported by the non-imposition of the Occidental and democratic values onto other cultures. Social agreements are in opens systems, where the word is recuperated to give voice to the social voices inside the society, to give voices to the different groups that are not in the "winning culture" of the market logic. The inconsistency of the word, as demonstrated through the intrinsic meaning of the term Occidental, cannot survive in open systems where the social and the cultural are tools that promote the exchange of energies across boundaries, and the process of knowledge is the main way to promote the movement of exchange.

The denial of access to knowledge is a strategy for the exclusion of the different (D'Ambrosio, 1998: 70). To share knowledge across boundaries is a

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social fact. The process of knowledge production is, however, sometimes blocked in practice by hegemonic systems. The institutions of knowing (the school, for example) and the learning and teaching formal processes that are inserted into these institutions (such as the process of learning that is actually practiced in schools) can be “food” to this hegemonic system. The correct and well structured nature of these institutions does not permit the exchange of energies across boundaries, is not prepared to listen to the voices from other cultures; working only in pre-definitions, made up of correct and ready models, and only using the daily examples that go with the current forms of multicultural speech.

According to D'Ambrosio (1986), the knowledge makes sense if it is understood as cultural. The places of the production of knowledge are the cultural places, embedded by traditional rules by power relations in the name of the particular ethos. Agreements among cultures are involved in the exchanges of cultural knowledges, of power relations, and of particular ethos in order to search the universal knowledge rules through new power relations in the name.

Sociology and the Truth of Knowledge

To talk about sociology is to talk about the study of society and the connections within and across societies. In *Thinking and Seeing* and in *Basic Concepts* sociology is discussed from a point of view, supported by some theoretical work and focused upon sociological images and actions and the connections between them and the asphalt children. It is not “the truth”; it is rather a position in the face of observations analyses, readings, and what has been learned.... It is a truth; it is a social truth. We could say in terms of the immediate ethnographic self (Mônica) that it is a self-centered truth that is possessed (“mine”) and is part of a way of being in the world, as and with others. Truth can be understood in this sense as a Wittgensteinian form of life.

No one can own “the truth” and in this sense all truths, those of the occident as well as those of the Other, are ethno-legitimate:

... a reflexão e a aceitação do outro e, sobretudo, a audácia de aceitar que as diferentes ideologias políticas devem operar como diferentes modos de ver os espaços de convivência, que permitem descobrir diferentes tipos de erros na tarefa comum de criar um mundo de convivência, no qual a pobreza e o abuso são erros que se quer corrigir. Isto é uma coisa diferente da luta pelo poder (Maturana, 1999: 76).

Maturana attributes the failure of dictatorships and totalitarian and statesman systems, whether of a socialist character or not, to the fact that any one of them deposits all the wisdom in only one human group. This is how a tyranny is generated: because the others are refused.

We want to attract attention to the process of the truth of knowledge and not to the final product (if it is truth or not), to the complexity of this process, to the complexity of social structures, to the earthbound nature of social and cultural experiences, and to social knowledge and truths. In that way, the basic claim of the truth is the objectivity. The level of the objectivity represents the level of the truth. Objectivity requires truth and the truth is produced within a context, within a regime and this regime also requires this truth to produce, reproduce and sustain itself.

Maturana brings his own understanding to this relationship between truth and objectivity, sharing the objectivity in two ways. In one way, Maturana argues that what is said is valid because it is objective and rational, not because of who is saying it. If it is said that you are wrong, it is not somebody who determines that you are wrong but the reality. Here, the clarification does not occur in the mutual acceptance, but in the exclusion that it is different from the truth. Whatever is not with the "truth" is against it. Here, the person from whom the truth is withheld is always irresponsible in the negation of the other because it is the reality that denies it. In this case, the body appears as an instrument of expression and also as a limit to its expression. If an account of the truth is not given it is because we have some deficiency that needs to be surpassed.

In another way, Maturana argues for the possibility of objectivity that promotes the capacity to make reference to a reality independently of who makes it. Thus, there is no relative truth but many different truths. When the opposition to a domain of a reality happens, it is against a truth that walks in this domain, in this referential world that is not pleased, and because of that it is not recognized. It would be a responsible negation, that is, a negation of the other and of her/his ecosystem. Here the body appears as something that constitutes and makes a reality possible. The truth is ours and is part of our way to be in the world, alongside others. In the first sense, objectivity is seen as a pure way to make an accurate description of reality. In that sense, the asphalt children's reality will have a static truth forged by their own reality; a picture focusing just upon their actions over the world and not on the relations between their actions and their ecosystems, would deny their truths.

In a second sense, objectivity is seen as a mode of inquiry, relying on no arbitrary and no subjective criteria to develop, accept, and reject the hypotheses and theories that make up the view. In that sense, the relations between the asphalt children and their ecosystems will be recognized, thus recognizing their truths. The fundamental issue here is more than arguing about objectivity and the kinds of truths that these ways promote, delegating the better or true way to promote the recognition of the different truths. Our focus - affirming objectivity as a social fact and political action - is on what these different truths do in the context of the social relations of the asphalt children.

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One way to analyze it is through showing how logic is an important tool in the relationship between objectivity and truth, since logic functions as a resource of power. It is not just that something is or is not logical in some absolute sense. It is that logic - and certainty relations in general - are cultural resources that can be used to defend or attack a social order by affirming or denying self-evident statements (Restivo, 1992: 114).

According to Restivo (1994), the individual human being cannot be logical or illogical; rather, s/he can only be in agreement or disagreement with the objectivity of the community, the thought collective to use Fleck's term. To think logically is to think impersonally, is to think collectively. The basic material of logical thought is made of collective representations. Concepts, like all knowledge, are the ways that society conceives things. They are productions that are created and experienced by the human being within social practices, enrolled in a cultural framework that is both limited by, and limiting, in its power. Most of our present concepts lack clear definition; they are defined only when we are cornered to give a definition - when the discussion appears with this objective - and when they are operated by/towards the world of science, the owner of scientific knowledge. Scientific knowledge, the knowledge accepted by the body of scientists called the academy, is the strong link between truth and knowledge in our time. During the history of human beings, truth and knowledge have coexisted and it has happened because some social body, embedded by its collective representations, solidifies or strengthens the power of its truth through its logic. This resource of power is always used by any social bodies that work with knowledge. Power is a construction of a reserved space, a monopolized space, that has mechanisms of power over the bodies that are on the outside. Essentialism, Platonism, Catholicism, and apriorism are some examples of these bodies developed to withhold knowledge, enclose and protect it, or otherwise monopolize it.

Social relations as constituted within science, truth, and logic can embody inequalities, destroy ecosystems, limit individual growth and development and undermine inquiry. Knowledge can be the secret key to promote this process. If, in the process of knowledge production, power and a truth are instituted without interaction among all bodies that are involved in the production process, it can be seen as linear. All bodies that constitute the social relations in this process need to have a voice and this voice needs to contribute by bringing to life the dynamic side of the process of knowledge production and to respect that dynamism.

The alternative to this secret key becomes critical knowledge, critical thinking. Both human thought and the human capacity to think need to be respected and free. The degrees of freedom in this capacity are restricted by the extent that one's wishes are in accordance with the wishes of others, and by the constraints of the ecosystem. Wishes are movements of knowledge production that involve all living species of the social world. The world of

science is much more than the scientists’ world; the science world is much more than the body of scientists – the academy. The science world is a social world, as convincingly argued by researchers in the new sociology of science.

If the truth of knowledge, in modern society, is the truth of scientific knowledge, it can also be argued that it is imperative that critical thinking returns the truth of knowledge to the hands of the workers, while the scientific body removes itself from the centre of this process and locates itself at the boundaries, to be questioned, and discussed.

The dynamic process of knowledge production in the social world involves economic, political, cultural, religious, biological, and all sorts of other factors. In face of that, the content and the structure of knowledge is not “given” by logic or the nature of reality – a transcendental explanation of knowledge – but is constructed by social phenomena.

Many thinkers, both academics and non-academics, have made contributions to our examination of the processes of knowledge production through more mundane explanations of it. Understanding the processes of knowledge, in the academy and through the study of the social world, has taken the form of an awakening of the sociology of science. David Bloor and Barry Barnes are leading proponents of the strong programme in the sociology of science, which aims to investigate all knowledge using sociological methods and considers sociological factors as the decisive ones. The key features of the strong programme, according to Bloor (1976, 1991), are that knowledge can be explained in causal terms, that explanations can be impartial and symmetrical with respect to the truth or falsity of the beliefs being explained, and that the theory can be applied to itself, can be reflexive.

In the 1980s, Sal Restivo and Daryl Chubin, proposed a weak program in the sociology of scientific knowledge in response to the strong programme presented by Bloor and Barnes, and to other branches of the old and new sociologies of science. The key features of the weak program are, according to Chubin and Restivo (1983), breaking down the distinction between doing and thinking in theory construction, and criticizing the ideal of the value neutrality of the strong programme. Restivo (1994) emphasizes theory as political action, criticizing the scientism of the strong programme for adopting the ‘successfully proven’ scientific methods as universally valid. In this theoretical framework, the researcher can thus be viewed as part of her/his theory, as more than a detached observer, and as critically involved as part of the process and within the role of citizen.

The sociological factors are important in science, and the pre-eminent factors in whether a theory is accepted as being true or not. This is so in a complex way based on the way bio-ecological factors are intertwined with social and cultural factors and part of the same natural order. The weak program treats science as a worldview, a value system, a mode of inquiry and a way of living and working subject to criticism and to fundamental changes coincident with fundamental

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changes in its socio-cultural surrounding (Restivo, 1994: 22). The weak program is a way to bring knowledge to the hands of the workers; it promotes the idea that the truths of knowledge should be questioned and discussed. Whether or not any form of knowledge, scientific or otherwise, deserves special treatment must become an empirico-practical question, a question of praxis; this is not to be left to philosophers as putative experts on rational minds and methods.

The methodology of the strong programme is not at all free from the critique of the political-activist perspective. In this movement the locus of reflexivity in the strong programme is the individual. Theory is a practical political action and the relativism embedded in the strong programme does not give flexibility or permit the pursuit of political implications. The strong programme does not make it easy to explore the methodological colonialism of successful Western science. Chubin and Restivo (1983: 73) argue that the role of the social study of science in the policy process should be to challenge conventional policy wisdom and jar the policy-maker into perceiving a complex, and a “multiple” reality. Social theory is not only a route to critique theory in science studies, but also a route for ‘saving’ science as an intellectual enterprise. The social, as a background of all processes of knowledge production, must be reinforced to give credibility and legitimacy to the knowledge that is, literally, created by social relations.

Not everyone is equal in their abilities to construct and evaluate scientific knowledge. Traditional ideas of the nature, limits, and contexts of scientific knowledge may be too confining. There are varieties of scientific experience, generators of science outside of the academy. This can only be interesting to the extent that the varieties are required to engage with the realities of the world and not with dreams, fantasies, delusions, and wishes. This is more difficult than it may appear at first glance, especially to traditional scientists. It is, nonetheless, the conclusion we are led to by studies in the sociology and anthropology of science. Second, our position is that everyone must be brought into the process of doing and using science taking into account their abilities and interests. Science cannot operate in its own hermetically sealed context without links to the wider society. This does not mean that they should become slaves to science-as-public-opinion. It is one thing to argue that creationism and intelligent design are culturally and ideologically driven and that we must make every effort to understand the ideas and the contexts. It is quite another thing to argue that creationism and intelligent design are sciences. In the end, we have to walk a fine line between a commitment to an encompassing engagement of different populations in the process of knowledge production and a dogmatic and exclusive commitment to the truths generated within the community of scientists per se. So far, we have been on a trip through some sociological images and actions by means of social theory to develop a theoretical sociological support system for the research at the center of this book. The idea

has been to highlight the link between the space concept of the asphalt children and their social practices. In this theoretical moment, we still need to consider how to understand some mathematical images and actions; this understanding will contribute to the credibility and legitimacy of the asphalt children's knowledge about space, constructed as all knowledges are by their social relations.

NOTES

- ¹ Durkheim's Latin thesis was dedicated to the memory of Fustel de Coulanges.
- ² Durkheim's French thesis - The Division of Labour - was dedicated to Émile Boutroux.
- ³ Alfred Dreyfus, who shared the same last name as Durkheim's wife but came from a different family, was an official of the French Army convicted of treason and imprisoned in the prison at Devil's Island in French Guinea. Liberals and intellectuals mounted a campaign to prove that Dreyfus had been wrongly convicted because he was Jewish. To be Dreyfus or anti-Dreyfus defined the French at the end of the 19th Century and early 20th Century because the case – the most famous at that time – condensed the political antagonisms of France. The "Dreyfus affair" became an important political event in Europe, especially in France, with Emile Zola and socialist parties taking up the defense of Dreyfus.
- ⁴ An expression named by Rousseau (1762; 2002, p 22) to argue what happens when the individuals come together to form society. The general will is different from the will of all. The general will considers the common interest while the will of all considers the private interest, a sum of particular wills. Rousseau's idea of the general will is describe below.
- ⁵ Atomism is the theory that all the objects in the universe are composed of very small particles that were not created and that will have no end. The word atomism derives from the ancient Greek word atomos which meant "that which cannot be cut into smaller pieces". which is completely different from anything that could exist in individuals outside society. Rousseau named it "the general will". The general will is not the sum of individual "particular wills". Rousseau (1762; 2002) defines this general will as being formed by people becoming social, becoming part of a collective. It is not just all our individual wills put together, but something distinct in its own right. The general will is formed by society and it is society. Durkheim says that this means Rousseau sees society as a reality. If society is real, it is possible to have a science of society (sociology). So Durkheim finds in Rousseau the philosophical origins of sociology.
- ⁶ Nous disons notre individualité et non notre personnalité. Bien que les deux mots soient souvent pris l'un pour l'autre, il importe de les distinguer avec le plus grand soin. La personnalité est faite essentiellement d'éléments supra-individuels.
- ⁷ The social order, according to Comte, is the correlation or interconnection among the elements of society.
- ⁸ A thing, for Durkheim, is something that is real. It can hit you. Try walking into a lamp post as if it was not there, and you will discover what a thing is.
- ⁹ This refers to the link and the movement between the psycho-bio-social individual.
- ¹⁰ Parsons, Shils, Nadel, Cluckhohn, Leach, Rediefild, Lévi-Strauss, Firth, and Singer are some of the social scientists who deal with this subject, in different ways.
- ¹¹ In Wikipédia: <http://pt.wikipedia.org/wiki/Multiculturalismo>