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Social networks in the city, or the urban condition of coexistence

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Abstract

The present work brings an alternative approach to the possibility of *designing coexistence* in the city. It proposes that before conceiving and designing the spaces of coexistence, we need to *understand* the urban conditions to promote the recognition of differences of groups and classes in concrete spaces. It develops an approach able to identify different patterns of spatial appropriation deeply related to social networks formation: the spatialisation of practices and bodily movement. In turn, they constitute patterns of encounter and controlled possibilities of communication at the heart of the emergence of social networks. The paper aims to address processes of real-time segregation in our cities, unveiling roles of space in generating convergences and divergences of different socialities in urban experience.

Key words: real-time segregation, coexistence, otherness.

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1. Introduction: *understanding* before *designing* coexistence

One of our major concerns is to assert the possibility of the "contemporary city as a locus of the plurality, of communication among the socially different, of of acknowledging the Other. This paper investigates the conditions through which plurality, social diversity and actual communication among socially different people may emerge. It addresses directly the complexity of potentially connected actions and interactions that compose everyday lives in the formation of social networks. It argues that, before trying to conceive and design the spaces of coexistence, we need to understand the urban conditions to promote coexistence and the possibility of recognition and interaction of different social groups and classes – or how the city may relate to coexistence through its very concrete spatiality. This paper aims to describe processes of real-time segregation in the city, trying to unveil the role of actual space to approximate *segregated worlds in order to relate different socialities within the city*.

The problem of social exclusion is indeed generally related to segregation, defined as restrictions which place limits upon contact, communication and social relations, or limits on social interaction (Freeman, 1978). As far as urban approaches are concerned, segregation is usually seen as the process of formation of socially and spatially differentiated areas. We see spatial segregation as a means to engender social distance. Space separates.

However, people do not remain static in these areas. People move through spaces within the city, appropriate different places in different situations – from commuting to work or going to places for having fun or socialising. We may think that mobility could well render space an obsolete means of producing, setting or embedding segregation. Yet, as we shall see below, mobility varies according to social inequalities and context, and in many different regions and cities, segregation still appears as a strong feature – even in current, 21st century urban life and its high mobility and connectivity (Thrift, 2008). So why do we still observe segregation as an active part of social life in our cities? Our cities still seem like efficient machines of distance between the socially different. The core of our argument is that, since our societies are interaction systems of such complexity and we are so mobile, we have to see space beyond usual views of spatial segregation. This paper proposes *a look into spaces deeply intertwined in social actions, daily movements and interactions.* Indeed, that would imply penetrating a highly complex and elusive substance of the social, a virtually traceless maze of actions and interactions. In order to do so, we shall first (i) shift the substantive focus from segregated spaces to *the centrality of the body in mediating potential interaction* between the socially different, i.e. from identifying where different people live to identifying how they move, act and interact in the city as attributes of their own social condition; (ii) identify how people get to know each other and their social networks are formed, so that similarities in their actions and lifestyles may be seen with a role in putting them together or apart as segregated networks, in order to see (iii) how social differences turn into structural distance, and the Other a form of *unknown Otherness*. Those would be descriptions of the emergence and relation of different

social worlds within a same city. We shall see how differences in the forms people appropriate space to live, move, work and so on are put into action, shaping how they perform and meet and how their personal networks are constituted beyond the appearance of random encounters. Then, we shall see how sequences of encounters in time-space structure social networks, and similarities and differences in daily urban practices turn into internally cohesive socialities – and consist of the very movements of a real-time form of segregation. In such form of social reproduction, the city ceases to be a means of generating interactions that may relate the socially different, and ensure coexistence.

The present work addresses instances that constitute social life, where the problem lies *de facto*: the acts we perform in the city, collectively immersed in duties and activities of social reproduction – instances hold an unsuspected manifestation: the subtle penetration of social distance well within in the realm of everyday life. That is a problem we have become accustomed to exactly because it constantly cuts across our urban experience: how socially differentiated acting subjects moving through and appropriating spaces of the city do so while virtually unacknowledged to ourselves.

2. The condition of coexistence: how we experience urban space socially

I would like to advance a microstructural approach to social coexistence and its opposite, social segregation, using a well-known notion, "social network", here meaning open sets of relationships among social beings.[2] That is a concept able to deal with different scales of social relations based on ethnic, class or group interactions, which may be materially extended in order to deal with the spatial conditions of social integration in different contexts. This approach is also based on a second concept – one able to identify different forms of appropriation of urban space that may be related to different groups. Appropriation patterns have to do with forms of enacting space socially. They are intimately related to mobility and the capabilities of carrying on activities in the city. In uneven societies, certain social groups and classes have limited budgets to absorb costs of transportation, or cannot afford to have private cars. Income also matters in the number of consumption activities one is able to engage.

Let me advance a form of analysing the city beyond segregated areas: if we draw upon configurational studies,[3] we may consider the city as a spatial network of streets and activity locations. Encounters are either dispersed in streets or polarised in places like bus stops,

[2] Our discursive and visual use of the notion is different from uses in Social Network Analysis and other graph theoretical approaches (e.g. Gravonetter, 1973; Scott, 1991; Wasserman and Faust, 1994; Freeman, 2006). This approach was first developed in Netto and Krafta (1999).

[3] Kruger (1979), Hillier and Hanson (1984), Krafta (1994) and Holanda (2002).

underground stations, work, leisure and consumption places, or complex buildings like shopping centers or universities. These activities are "attractors" to social agents: it is within buildings that a substantial part of social life comes into being, like communication and the possibility of relating individual acts into complexes of actions that make up societies.[4] Urban activities are highly related to the roles they play in social life [spanning from functional and economic to symbolic and non-instrumental] and to socially differentiated communities or groups. We may join a particular activity if it interests us, if we have a role to play there, if we may afford it, and if we may get there – and before that, if we are able to know where it is or that it exists in the first place. Now all these things mean that the plethora of activities that make up cities are either not interesting or accessible [socially and/or spatially] to everyone. Nevertheless, they are still attractive to groups willing and able to access them and participate in those ongoing social situations. They have impacts over our actions, being the spark to the maze of movement emanating from residential locations. Movement, in turn, frequently involves large distances, covered by pedestrian movement, public or private forms of transport [from the underground and buses to private cars]. These forms affect it as much as the street network that connects all these places. The appropriation of space relates to the number of places and activities one may reach, and public spaces one passes through. If movement and action left visible traces in space, we would see such spatial networks of appropriation. Relating these paths to specific groups' appropriation patterns and how they are active in social networks formation, is, in essence, the aim and method this paper undertakes.

Now, if we were able to relate different appropriation patterns embedding these spatio-temporal paths to different social groups, we could start to see networks also as *differentiated* networks – as channels and "nodalities" of social convergence. Certain groups would move through somewhat different streets [even though many of them may be in common] and appropriate certain locations more than others.[5] These spatialised networks of appropriation are traces of our effective presence in space. If we could map at least part of these paths, we could have a good idea of how socially differentiated groups spatialise their actions. Importantly, patterns of appropriation of space shape the material action of agents. When they do so, they tend to have effects over the potential to social interaction, and over the very formation of actual relations between people, the passage from the spatiality of interaction to the emergence of social networks. The theoretical path we wish to explore goes as follows:

Patterns of appropriation of space ➔ Patterns of encounter in space

➔ Patterns of social network formation

➔ Generation of coexistence / different social worlds in the city

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[4] We draw this observation upon Habermas (1984)

[5] Gonzales et al's (2008) extensive data base of mobility recorded through mobile phone calls in American cities showed a remarkable tendency to recursivity in movement and appropriation of spaces and places

3. Social network formation in space

What is the chance of meeting people from other social groups? If we could understand how space is part of possibilities of encounters, we would take a key step in understanding the dynamics of coexistence / segregation manifested upon the body. The way we enact the city is the key here. It is active in the generation of the main 'substance' out of which social networks are formed: encounters. Giddens (1984) notion of *seriality of encounters* as a means to the coordination of, social organization and integration interactions in time and space is certainly helpful. We would like to add to this a second notion: that of societies as *systems of encounters* (Hillier and Hanson, 1984). These two notions will help us understand the role of encounter in the reproduction of socialities, and to define a notion of patterns of encounters as sequences active in the definition of circumstances of co-presence and effective interaction in heterogeneous societies.

Being in a same place as other acting subjects is of course the condition of actual interaction [as opposed to dematerialized interactions through the internet, which have a completely different nature and role; virtual encounters hardly could hold a society together]. The formation of social networks depends on circumstances of co-presence, in turn a matter of access to ongoing activities in a city. Social situations are spatially arranged in a way that renders them subject to different features of social and spatial access: they may be outside one's field of social interests, budget or spatial capabilities. Action paths are shaped by urban structures, potentials of mobility and social interests: sequences of encounters in specific places will depend upon them. Urban structures and spatial patterns of location and accessibility in a city matter: they imply streets and areas and places where we are most likely to converge to in our daily lives and routines. Spaces that compose "daily paths" (Hägerstrand, 1970) constitute the dots of convergence of the maze of life lines – vortexes of co-presence and potential interaction (figure 1).

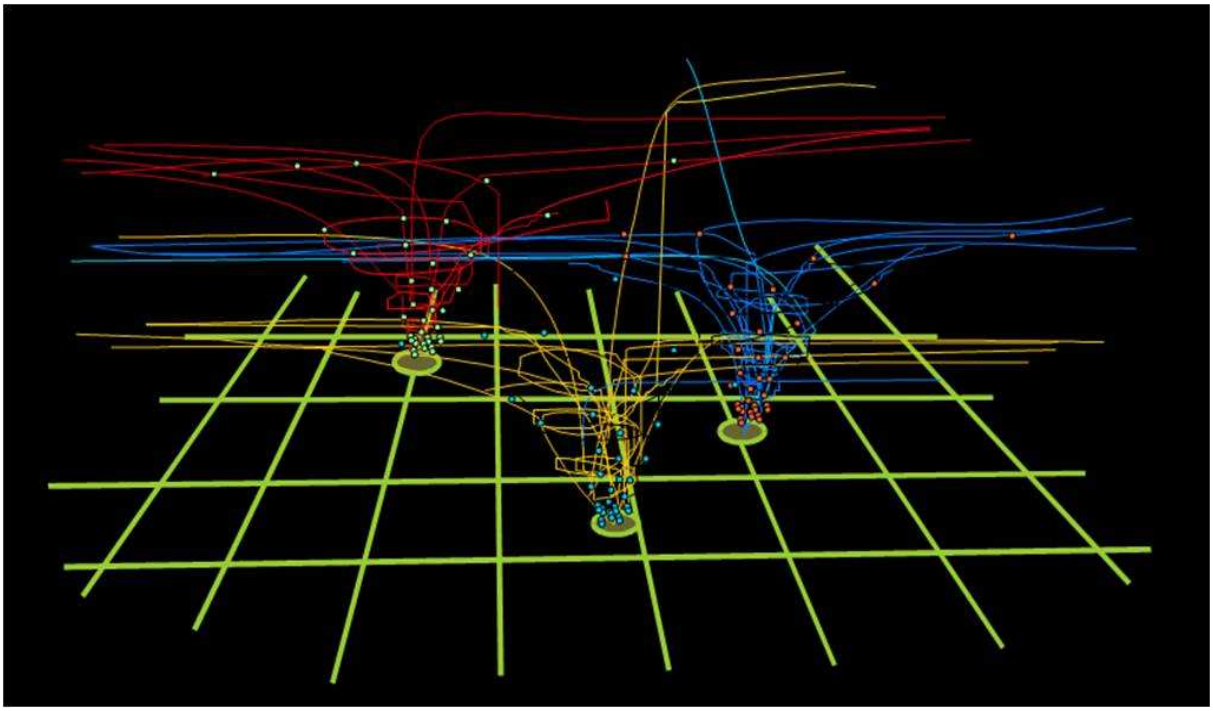

Figure 1: Urban nodalities converge actors and their "lifelines" in time-space.

The city is enacted like a structure of polarised places accessed in different moments. These nodalities increase the potential to converge actors sharing similar powers to move and enact the city; they are the spatial dots in the formation of a particular social network. The broader and more complex the pattern of appropriation of space [and the social and spatial mobility embedded in it], the broader one's potential to form personal social networks spread over this geography. That tends to be the case of groups of higher income, able to afford costs with transportation and consumption. Activity places produced by and for those social groups may also be less reliant on a specific location pattern – they may be spatially distant from each other. In this case, the major factor to build social relationships and personal networks shifts from "proximity" to "mobility" itself. This *power of spatial mobility and social access* allows agents to join a higher number of activities, and these places mediate new encounters and potentially new relationships.

Social groups and classes with less power to move and enact the city have patterns of appropriation of space that demand more theoretical attention, since there are regional differences in the balance of inequalities. In strongly unequal cities, these groups have very limited budgets to invest in activities of consumption, so leisure activities are constrained by those factors – which in turn generate other forms of appropriating space for organising social life. Observations and empirical studies [see below] show that these groups are more closely related to the areas and public spaces around home to interact and develop relationships. Of course, these groups also produce social nodalities, which also articulate sequences of social situations and recursive interaction in space-time frames more adequate for communication

and social network formation. It is also very important to consider that there is indeed a range of non-dependency on proximity in the pattern of spatial appropriation of these social groups. Activities placed around work increase the range of appropriation of city space, even if tied to the temporal frame of work. Public transport and increasing ownership of private cars certainly allow broader and more complex paths and geometries of movement over the city structure. However, as mobility is refrained by limited budgets and spatial friction, there is still an overall tendency to a local level of appropriation, with spatial ranges frequently limited or shaped by the pedestrian range of movement.

Based on these observations, we propose two typical spatial patterns of personal networks: (i) networks based on more complex patterns of appropriation and more power to move and enact in the city; and (ii) localized networks, based on proximity-dependent appropriation patterns and social encounter systems. The differentiation between these two is clearer in strongly uneven societies.

4. Exclusion and segregated networks

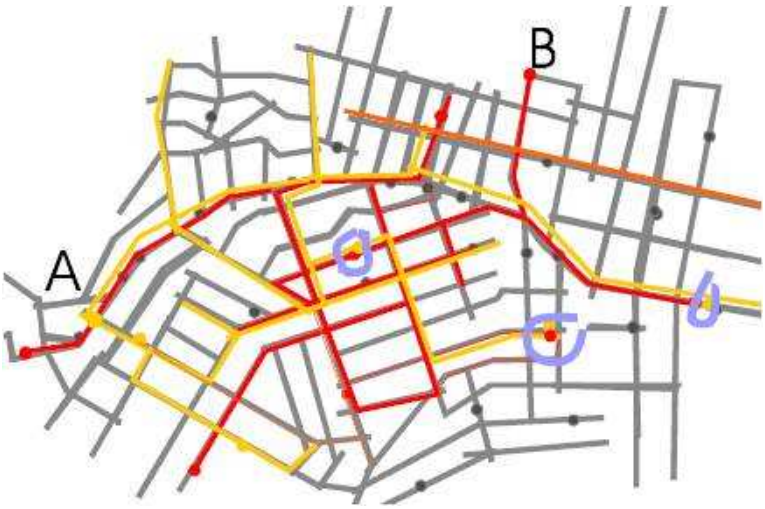

Figure 2: Mapping paths of agents moving through city spaces allows a deeper assessment of segregation as a real-time phenomenon. Social networks, even strongly segregated, may overlap in certain streets and places.

We may infer from these observations that spatially complex personal networks are able to mix with more intensity (figure 2). Potential to mobility and access to different social situations distributed in space according to accessibility patterns shape geographically the social reach of networks. Different nodalities will articulate differently the sequences of encounter and the formation of differentiated networks. Groups and classes of higher income, more mobile, tend to have a stronger potential to have a broader knowledge of their own group or class. Encounter may succeed more intensively, as agents may overlap recursively over distinct

places and get to know other personal networks. In less mobile social groups, recursivity of encounters is strongly dependent on spatial proximity.

Group and class networks are structured through more likely connections of personal networks, in turn affected by appropriation patterns. A step further, spatial differences in patterns of appropriation which anchor social networks imply incompatibilities in the sequencing and location of social situations that could overlap them: a disarticulation of encounters that becomes intertwined in relationships. Differences in lifestyles and income, spatial mobility and social access to events bring mismatches in the very spatio-temporal structure of actions of socially different agents. It consists of a displacement of the material possibilities of co-presence, communication, and the probability of new encounters. In other words, there is a higher probability of social networks absorb agents sharing similar appropriation patterns, however complex or spread over the city those coexistent patterns may be. In addition, daily paths affect the course of one's life – her activities, circle of friends, the time available, opportunities of work. They compose the material structure of social life, constantly changing the future scenario of social actions and interactions.

Synchronicity and complementarity of actions

These descriptions evoke the complexity of social life and its material conditions. But if one's action path already seems something so difficult to apprehend, how can we see personal paths intertwining or diverging in urban space? How can we have a broader picture – a picture of the whole of these spatially tangled life lines? We connected the constraints and possibilities of joining social situations to the role of urban nodalities and spatial patterns in structuring the very formation of [differentiated] social networks. We would like to deepen the descriptions of these highly elusive processes of social aggregation / disaggregation through a set of notions. First, we shall propose the extension of a concept originally found in spatial economics: the idea of urban *complementarity*, and break it down in three: (a) the usual complementarity of urban activities located in space; and its unfolding into (b) the complementarity of actions among agents, and (c) the complementarity of actions within one's own routine or action plan. These three articulated complementarities lie at the heart of the urban reproduction of social life – what keeps us together as localised social systems. Second, we shall also break down Giddens' (1984) notion of routinisation in two: *synchronicity* [the simultaneous occurrence of social events and actions with no discernible causal connection] and *recursivity* of agents' actions [the drive to repetition, a notion also explored by Giddens]. The unfolding of these two original notions should serve us to penetrate into the relation of individual actions and the urban activity system in the generation of the circumstances of co-presence and interaction, and how social networks are spatially produced and reproduced. Our intention is to demonstrate the city as a material system of possibilities of action, encounter and communication:

Urban structure ➔ Synchronised / diachronous action paths in space

➔ Convergence / divergence of differentiated networks

The concepts of recursivity, synchronicity and complementarities of actions paths as manifestations of urban activities and routines encompass, accordingly (a) the *temporally vertical condition of action* [connection[6] through repetition: actions are frequently recursive in time]; (b) the *social and functional condition of action* [connection through systemic interdependencies: actions are embedded in interrelated, complementary social situations]; and (c) the systemic bridge between these two conditions [connection through proper periods to carry on particular activities: during their actualization or through exchanges of their outputs, social actions are partially synchronized or aligned in time and in space]. This analytical framework is intended to grasp the *elusiveness of cooperation of action*, and unveil both the fragility engendered by the volatile condition of interaction to come into being, and the strength of a massive and recursive system of actions geared to functional organization. In turn, social organization is collectively produced and reproduced through synchrony and a material structure: the city itself. Aiming to describe the possibility of superimposition of agents' daily paths, it ends up reaching the relation between emerging socialities within a localized social world and its urbanized structure: aspects of the material organization of social action.

The urban scenario of multiple social nodalities attracting and converging life lines intermittently and simultaneously, randomly yet structurally, contains a complex form of internal synchronies – to be sure, immersed in syncopation - due to the mutual dependency of chains of actions and activities, their complementarity and the relative coordination of actions. Even when free from temporal frameworks, actions are always already bound to spatial structure and spaces that elude structure [perhaps the very interstitial spaces of Otherness]. Such analytical reduction of the complexities of daily actions in a city seems potentially meaningful: they are observed in the material structuration and routinization of life, and refer to the social and material actualization of daily individual efforts and the association of practices – temporal and functional challenges of social reproduction that we take for granted. Here, space finds a role of difficult theoretical grasp: we must imagine agents immersed in activities arranged in frames of time, some simultaneously converging in points of urban space, which in turn might be empty in the next moment. Seeing the spatiality of the tremendously complex maze of social convergences and divergences is virtually impossible – but reductions of such scenario would probably help us understand the dynamics of social life and the conditions of integration and segregation. Excerpts from this spatio-temporal form of the social organization may be mapped in a four-dimensional diagram (figure 3). Activities

[6] A notion developed by Parsons (1971) and Luhmann (1995) related to functional relations of actions in a social system.

performed in T1, T2 and T3 happen in different moments or concentrations of time; in those moments, we have the convergence/divergence of the routines of different agents or lifelines.

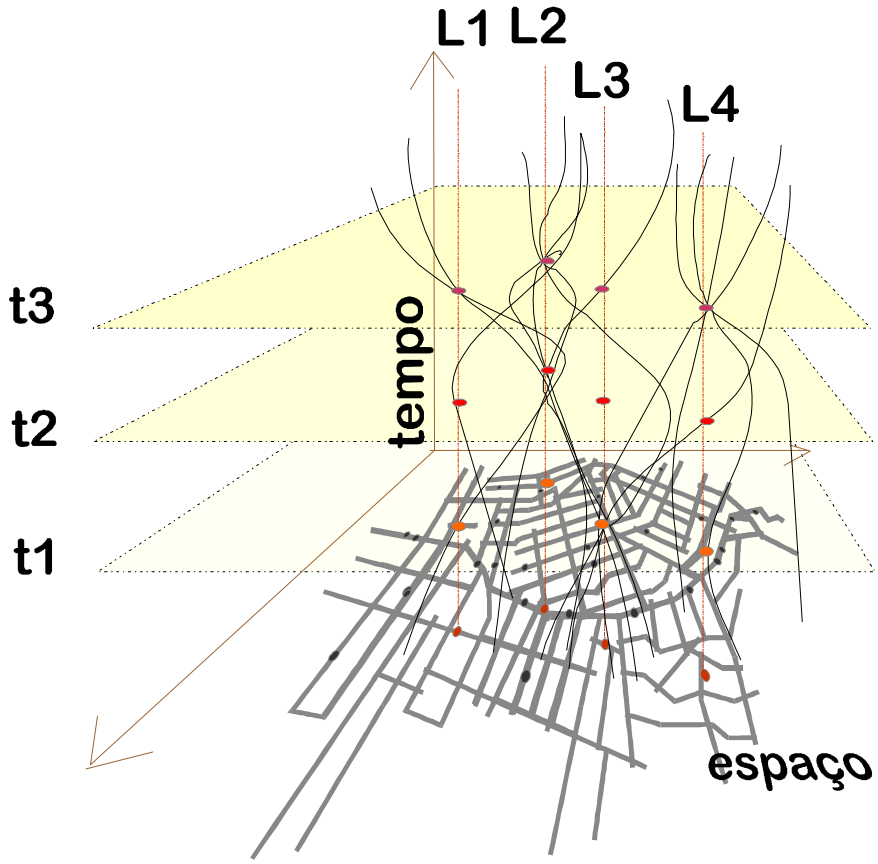

Figure 3: Social networks enacting the city: recursivity, synchronicity and complementarity of actions in time, and patterns of appropriation, accessibility and complementarity of activities in location patterns in space shape both randomness and pattern in the possibilities of encountering the socially different.

5. Randomness and contingency of encounters

> *All organizations involve the co-ordination of interaction in flows of time-space relations 'channeled' through contexts and locales* (Giddens, 1984, p.77).

In order to see how the city as the locus of coexistence operates through differentiations within the everyday flows of interaction in time-space mentioned by Giddens, we would like to tie this set of concepts a little tighter as to penetrate the chains of actions based on co-presence that constitute the formation of social groups and networks. A substantive key into that structure is the possibility of convergence of actions into specific places. We may understand the generation of differentiated flows of action emerging from the sequencing of social situations in specific sets of activity places – say,

within the "work place → lunch place → work place → leisure activity → residence" structure – with a relatively synchronised and recursive convergence, having as a result the amplification of possibilities of encounter of socially similar agents [and by extension, groups and classes]. These places consist of the material backbone of the crisscrossing of individual paths and the production of relationships. Due to such temporal structure [especially in weekdays] and distribution in activity places [especially largely attractive and functionally structural activity-places, such as universities, hospitals, underground stations, shopping centers] in internally heterogeneous structures, we may find different densities of encounter, as well as the reproductive forces of segregation. A step further, social reproduction itself is constituted through [and constitute in return] convergences of life lines in spaces and times both in contingent and non-contingent ways. Contingency is of course hard to grasp theoretically, but we could tame it if we understood that actions, if they are to be social, operate in a relational fashion, and that *even contingency and randomness may be materially distributed and concentrated* – especially if we produce space in order to relate our actions and interactions.

In fact, we suggest that cities are devices exactly for compressing the absolute randomness and contingency of interaction into a form of "reduction of complexity", i.e. the reduction of possibilities and unpredictability of interaction choices [in Luhmann's sense]. Societies would structure space in the form of cities not only as a way to ensure socioeconomic exchange [as correctly asserted in spatial economics]. Farther and more subtly than that, they seem to do so as a way of dealing with the elusiveness of encounter, the fragile material condition of interaction, and the risks of a functionally unbearable level of syncopation in the association of action courses. Associations engendered by unstructured spaces or by complete, non-urban spatial dispersion would be socially and economically too costly for becoming the material backbone of interactions. If urban space is collectively and historically structured, then this very structure may well have the effect of converging bodies and acts into increasing possibilities of interaction, and the actualization of these possibilities into actual flows of interaction and communication heterogeneously distributed in a heterogeneous structure. Interactions are systemically related and anchored in nodalities distributed in urban space, which connect action paths and articulate what we experience collectively as social life. Such reduction is potentially useful to show the relative synchrony of actions performed in activity places distributed according to their complementarity, which in turn shape location and accessibility patterns – and beyond, into interstitial spatialities which may articulate particular social networks. In such a complex spatio-temporal frame lies a possibility of understanding the overlapping of action paths of differentiated groups within a city. Even if frequencies change, recursivity is likely to bring agents to certain spaces in their attempt to carry on their daily activities. Despite temporal differences, bodily presence may happen over and over and increase chances of encounters, having as variables the size of the urban system, diversity of activities and positions of groups and classes in their social space [in Bourdieu's terms].

So space still matters in social segregation – but in a way far more complex than segregated areas and with far more potential for integrating and segregating actors. Together, this set of concepts aims at uncovering the dynamics of localized social systems and their conditions of integration or segregation. Spaces of high centrality and accessibility are likely to overlap social networks in their paths to nodalities in search of interaction, increasing the potential to co-presence and recursivity of encounters. Additionally, appropriation happens in chains: from one place to the next, according to their complementarity within our routines, spatially stimulated by complementarity in location. A major feature of accessible spaces is precisely to allow complementarity within our routines, supported within shorter ranges easily covered. Of course, that increases the probability of encounter. Such probabilities are distributed according to spatial and temporal frames of action. Accessible spaces are potentially strong for converging different social groups and articulating private lives into collective life.

Indeed social contents of architectural morphologies distributed along accessibility structures have an important role in the reproduction of social relations and the configuration of social networks. However, the variety of action flows in a city – taking into account the complexity of selection among activities available in a city – generates a highly changeable panorama of encounters. We have seen that this complexity may be broken down through the idea that a same place articulates many action paths. Temporally, agents' paths converge apparently randomly, but in fact do so according to specific patterns of complementarity, recursivity and synchronicity. Spatially, paths are shaped by forms of appropriating space [the power of spatial mobility and social access] and social differentiation. Together, these material properties of action ensure the passage from individual action to social action, and consist of the very material condition of social organisation and reproduction (cf. Netto 2007; 2008). They do so, but in no mechanistic way: social organisation and reproduction involve high flexibility and variability in the material arrangement of action paths described. There is a direct relation between encounter patterns and spatial patterns, but one deeply embedded in probabilities and surrounded by randomness – a non-determinant relation where contingencies take the form of diachronism and distinct spatial choices. Randomness is never out of the process, but it is somewhat structured and filtered into partially identifiable probabilities – it is both around and within the fragile, elusive structures of social action. Action paths will converge or diverge as places and times of encounters according to the social differentiation of space itself. Life lines will meet synchronously within the organization of action flows in the time-space of the city, channeled through urban structures and molded by appropriation patterns and functional complementarity. These will be the spaces and times of constitution of encounters. From the recursivity of encounters, social ties of personal networks are formed, and by sheer affinities in the spatio-temporality of action paths group and class networks progressively emerge. That includes the actualization of a potential to social interaction latent in those very material affinities. The very spatio-temporal structure of differentiated paths will allow more compatibility among certain actors. Incompatibilities take the form of syncopation

in the choice, access and sequencing of those dots of space and time that compose our action paths. In other words, within our action paths lie distinct probabilities of encountering the Other.

A specific form of spatial appropriation relates to what Sartre (Giddens, 1984) defined as the "enclosure of relationships." Interaction, as the articulation of action paths, emerges in public spaces or within architectural borders. However, different appropriation and network formation patterns affect the possibility of interaction. The active material factor for the internal cohesion of social networks is the higher probability of encounter. At the same time, that is what separates them progressively, in the very flux of everyday life. If we could map network formations as spatio-temporal convergences of bodies in the city, perhaps we could understand the consequences of the segregation upon the body.

Empirical descriptions

These patterns can be identified through methods including mapping of individual daily paths and the analysis of accessibility patterns and transport systems in a city. The collection of maps of action of differentiated groups[7] generated either way are partial spatial descriptions of social networks. Techniques to superimpose these maps [analogical, algorithmic, or through geographical information systems] may be employed in order to assess how social networks potentially interrelate through space. We carried on a study of the second type in order to illustrate the application of the concept of segregated networks in a real context, the city of Niteroi in the Rio de Janeiro metropolitan region. We geared the study to a group of twenty people of different social classes picked randomly who attend activities in three units in Universidade Federal Fluminense located in the city centre [black dots in figures 4 and 5], in order to analyze their role in articulating distinct action paths. The study was based on income levels [up to R$ 1114 or U$ 637, from R$1114 to R$ 4806 or U$ 2747, and above R$ 4806 or U$ 2747 monthly][8] represented as blue, purple and red paths. We interviewed and mapped their paths from the time agents leave home to work and other activities during a typical routine day. We also mapped medical service, education, leisure and consumption places, as a way to enrich spatial information. Activity places are not differentiated out in the diagram, although this information is recorded. The level of superimposition of agents in space is shown by the intensity of colors of a same group. Maps show agents living in different areas in Niteroi and region.

[7] Other studies point out substantial differentes in the ways socially actors different [according to class] appropriate urban space: see Santos et al (1985), Holanda (2000) and Aguiar (2003). We would like to thank the valuable contribution of Lessa in this empirical study.

[8] Exchange rate in August 25th 2010.

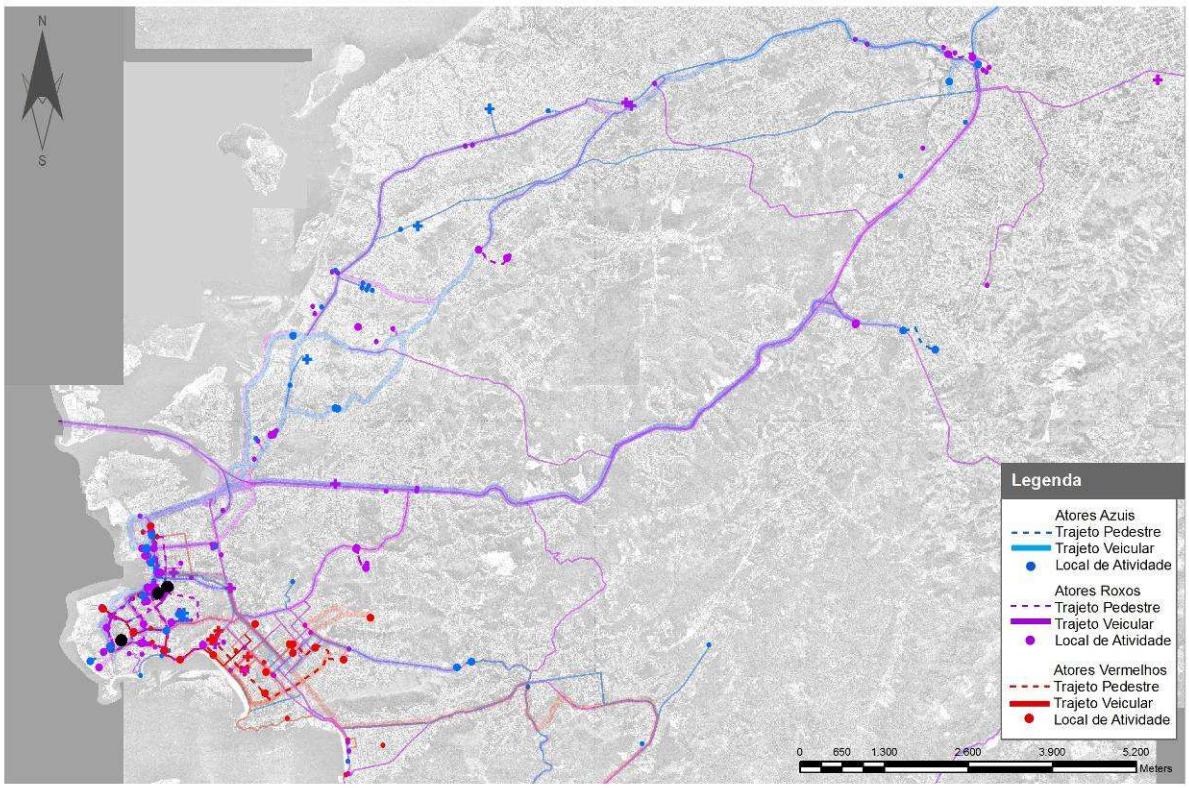

Figure 4: Spatial networks: action paths in a single day; blue [up to U$ 637], purple [U$ 2747] and red [above U$ 2747]. Blue and purple agents' paths substantially overlap, but purple agents have more mobility and reach.

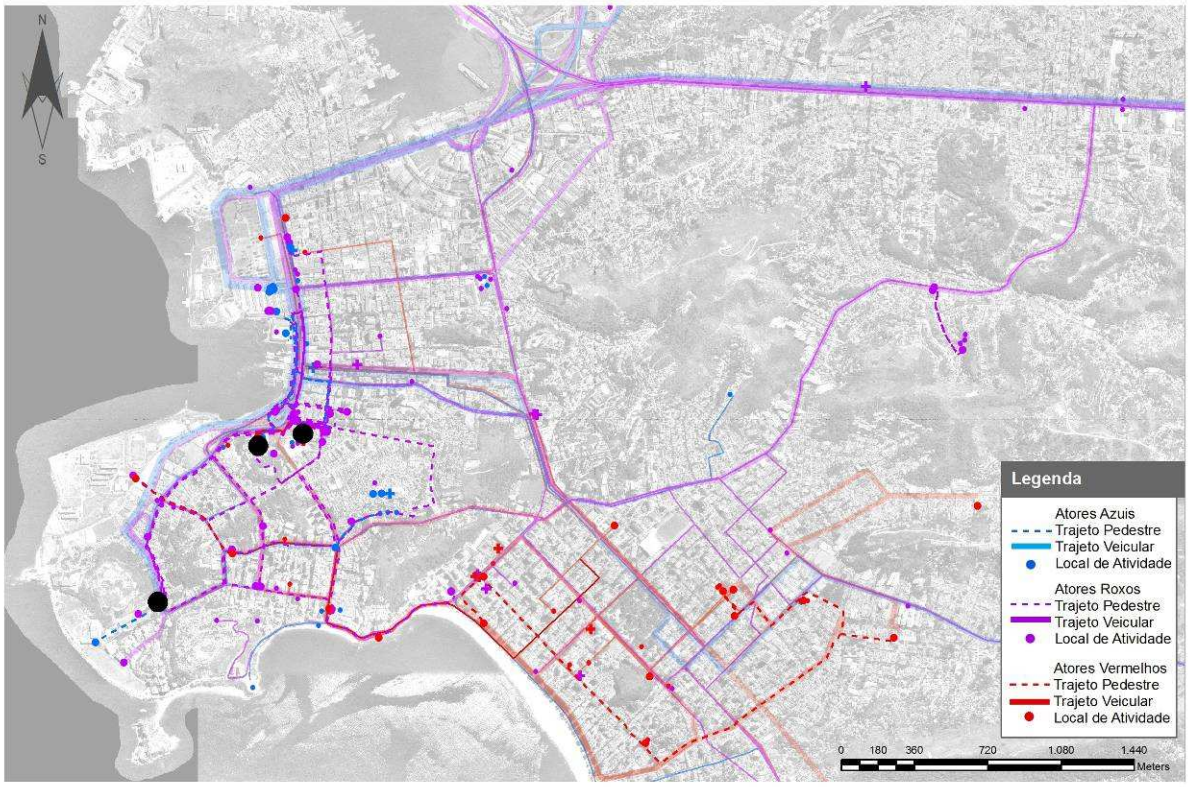

Figure 5: Zooming in: pedestrian movement is represented by dashed lines; public and private vehicular movement by continuous lines.

The study shows, first, the effect of residential segregation as initial asynchronies in agents' paths, with most blue and purple residences located in the north area. Complexities in location patterns are captured, as lower income agents may also live in accessible intra-urban locations [namely, *favelas*]. Second, we may observe how the position of places like a central bus station, consumption and service generate spaces of potential convergence around the work place. A graphic method (figures 6 to 8) adds the temporal dimension to the spatial action paths. It allows a different view into how appropriation and spatial patterns affect the potential to co-presence among the socially different. The diagram shows potential spatial synchronies as well as temporal disjunctions in these paths. When commuting to work, even distinct mobility levels may bring them to the same streets, as well as to variations in the spatio-temporal structure of their routines.

Figure 6: Coexistence and divergence: lines represent agents moving from the centre [vertical variation] and in time [horizontal variation]. A selection of three patterns: a highly pedestrian purple agent located in central area [a favela]; the spatio-temporal diagram shows properties of spaces based on distance from the centre. A red agent works part time from home, electronically networking with colleagues. The blue line shows a very typical action path for lower income agents.

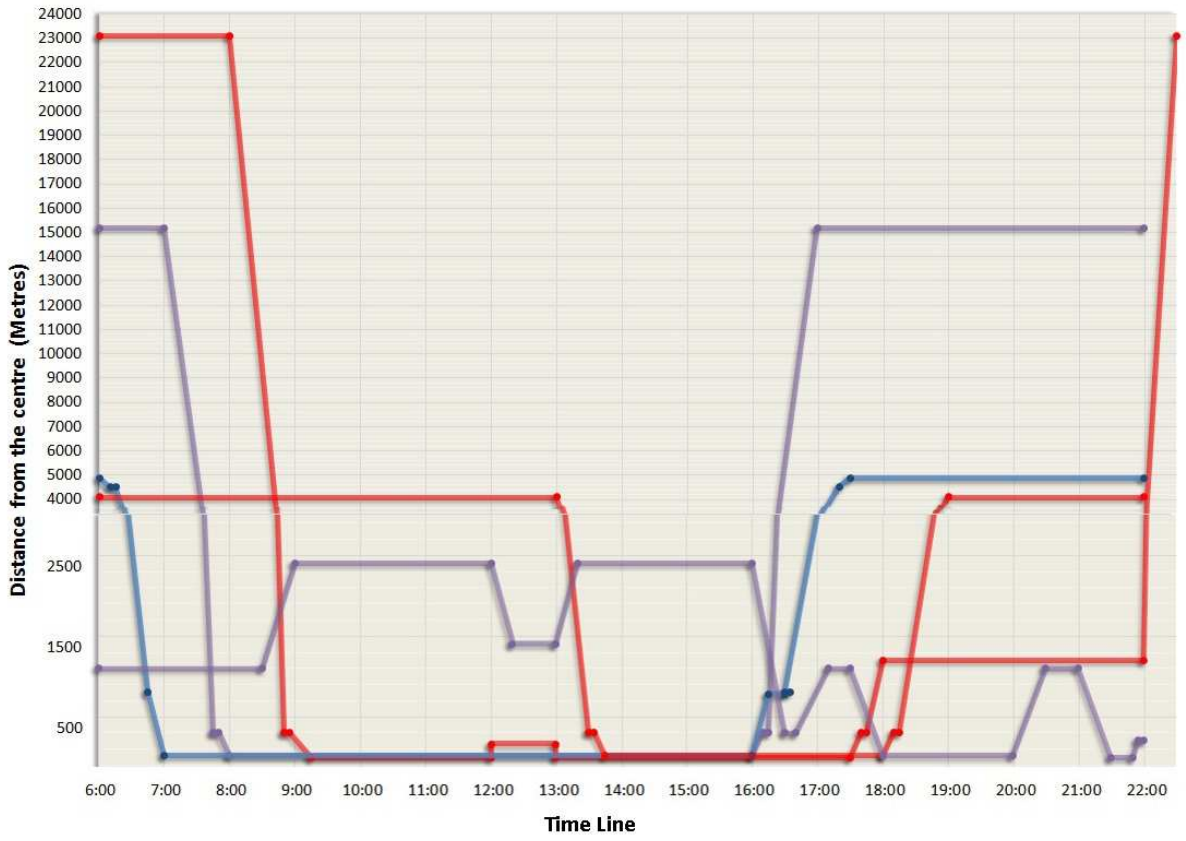

Figure 7: The spatio-temporal diagram shows typical cases in a micro-scale empirical study. The convergence of lines indicates potential overlapping of networks and times and spaces for acknowledging the Other.

Figure 8: Spatio-temporal diagrams may grasp the complexity of daily action paths in the city.

6. The [urban] possibility of coexistence

The present work attempted to bring an alternative approach to segregation as a spatially static phenomenon. This approach captures instead the paths of the body in space, and the spaces and places where the body is segregated [even outside segregated areas] and places where the body may be recognized as a sign of social difference, alterity and identity. The paper approached daily life in cities as agencies immersed in *controlled possibilities of interaction* naturalized in lifestyles and appropriation patterns shared among those with similar social positions. The notion of encounter patterns concentrated or dispersed in time and space may be general enough to be recognized even in societies that are more homogeneous.

These concepts allow us to understand the structural distance among agents as intrinsic to the very formation of networks. Controlled interaction is based on different social and spatial capacities to generate temporal and spatial situations to reproduce encounters and to diverge possibilities of encounter among the socially different – potentially desynchronizing their practices in the time-space of the city. Such emergences take the form of highly dynamic spatialised social networks with little superimposition. In other words, differences in appropriation imply specificities in the formation of social networks that lead into structural distance. Differentiated social networks, even moving along one another at times, lack convergences in number and nature appropriate to effectively intertwine through recursive interaction which would allow the contact with the other.

What about *designing* coexistence? Perhaps the best question is "how can we design spaces and plan cities in order to stimulate coexistence?" Any answer to such question must feed from knowledge of what spatialities actually generate coexistence. Urban diversity in activities, socialities; complexity in location patterns; accessibility and mobility are clearly key properties to be included in such actions. The concept of spatialised social networks was intended to focus on the conditions of coexistence as convergences of actions that do not leave visible traces easily: elusive movements, encounters and interactions that disappear virtually as soon as come into being, and bodies and spaces as real-time conditions for the formation of interacting social worlds within a same city.

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