

Sociospatial Reading of Favela

A Comparative Analysis from Organic Portuguese Cities

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Abstract: This research decodifies the favelas spatial system through its configuration in comparison to historical organic structures aiming at searching similar self-organized processes. It is intended to observe in which way the configuration of such areas, read through their spatial patterns, affects their sociospatial dynamics and how it gets closer to common strategies for organizing the urban space: in which way favela reproduces historically consolidated spatial patterns inherent to organic cities? The Theory of The Social Logic of Space (Hillier & Hanson, 1984) is the theoretical, methodological and technical approach for this study, allowing to investigate such phenomena by means of its spatial complexity. The sample consists of 120 settlements around the world, explored according to a set of 26 configurational variables (among qualitative and quantitative, both geometric and topological), compared to a group of 45 Portuguese medieval towns (representative of organic cities). Findings show that the favelas recognized spatial patterns are mostly common to those associated with organic structures. Despite being much denser and apparently labyrinthine shapes, the internal dynamics of the favelas reveal positive global relationships. These settlements behave similarly to consolidated urban systems and share common spatial logics throughout world regions and distinct cultures, feature which allows recognizing the self-organization strategy as essential to their structural and survival process.

1. Introduction

As a complex phenomenon, inside a systemic perspective, favela must be read in its whole system and its relationships among parts in order to capture its organizing structure. The systemic perspective assumes urban space as a spatially continuous whole (Hillier and Hanson, 1984) wherein the meaning of space lies with emphasis on its syntax, that is, the way its elements aggregate and correlate.

The intricate sequence of void spaces in favela often seems disorganized by the existence of spatial rules not based upon simple forms, but in the complex geometry of self-construction and self-organization processes. Favelas present peculiar organizing rules, unclear to the observer, such as fractality which apparently structures its irregular and fragmented form (Sobreira, 2002).

The emergent quality of organic spaces is explored in Christopher Alexander (1977) in his study of patterns (configurations) as in the spatial properties of built environment he presents to be found in nature. Frederico de Holanda (2010) also values informality in contemporary space by recognizing that volumetric and spatial configuration must be varied to achieve exceptional levels of urbanity. The author discusses the interaction between formality and informality in the living spaces, highlighting the relevance of spontaneous human activities in strongly formal areas, associating such presence – of activities and uses – to clear benefits for urban living (Holanda, 2010). In the same way, the author presents configurational peculiarities of favela spaces as promoters of urbanity, structural quality of good urban spaces that catalyse people and diversity, usually guaranteed by spatial characteristics such as clear notions of space, continuity, density and tenuous relations between the public and the private sector (Holanda, 2002, 2010, 2012). Such information reinforces the need to explore spatial reading strategies that allows inferring on spaces performance materialized by spontaneous practices as in favela, specially from the point of view of structuring spatial relations, that is, its configuration.

The research follows Space Syntax theoretical and methodological approach (Hillier and Hanson, 1984) which aims to analyse spatial configuration in terms of sociospatial relations. Therefore, the systemic observation over spatial complexity results in the interpretation of spatial structures into social dynamics.

The paper states favela as something apparently in permanent development, despite the common interpretation of its spontaneity as an undesired transitory process. As the city around it, it might not be a physical and static entity (frequently recognized as a problem) but a dynamical spatial process in constant adaptation. This process allows the existence of adaptative local rules and emerging processes. It is also emphasized the urgency of the re-reading of the city beyond the logic instituted by planning, where the concept of order tends to distance itself from spatial solutions focused on organic complexity (Batty and Longley, 1994). The urban configuration of the favela will be studied from the point of view of its complexity and its spatial patterns, in order to comprehend the emergent processes of city self-organization and its implicit order. For this, the study will follow strategies to evaluate the existing relations in the built space and its social performance.

The aim is the reading of spontaneous production of the city, regarding that official structures have no efficient answers for all demand. The study contemplates an approximation, from the point of view of the configuration, to a world reality whose socioeconomic categorization does not appear to be weighted in the different space-society relations that are identified. Such purpose relies on the hypothesis that the spontaneous or organic city as concept and form includes favelas, and that the spontaneous process of making city are transverse to the urban structures. It presents itself in global urban areas and in the history of settlements. This common process, which one seeks to read in favela, seems to guarantee characteristics of organization that attribute the type of diversity desired to a good development.

The lack of understanding of space in favela is recognized as the major obstacle to its consolidation, since definitions and positions on this object assume that its geometry and configuration are inadequate to today's city and this leads to intervention processes that interrupt their self-healing processes (Salingaros, 2006). It is believed that by ignoring configuration an essential part urban space knowledge is denied, and the scrutiny of the favela spatial configuration is relevant to better clarify this type of urban dynamics and its spatial patterns.

2. Defining favela by understanding organicity in urban structures

Informal settlements do not appear to have a homogeneous behaviour. Leeds and Leeds (1978), Sobreira (2002), Valladares (2005), Davis (2006), Jacques (2006), Pasternak (2008), Cardoso (2016), and so on, make clear the differentiation between favela, often located closer to central areas and the illegal settlement or allotment in periphery (Figure 1).

Valladares (1981) refers to irregular settlements or informal settlements as common processes in Latin America. But despite the frequent categorisation of informality as one thing, the simple fact that there is an associated initial cost, that of buying the lot (Davis, 2006), and the prior and global organization of spaces, makes the process seem quite different from that of favela.

Jacques (2006) argues about the adaptability of housing space to income production in the favela, a dynamic often incompatible with legality within the formal zoning and clearly more advantageous than the tendency towards homogenization of the periphery housing. It is not intended to deny the existence of a similar sense of community, after all both cases are spaces of urban segregation, but it is questioned if the ways of interaction prevail as dynamic as in favela. Jacques also discusses that spaces can formalize in different ways, and one might find the favela placed on the hill (*favela de morro*) and the “favela like” community (*comunidade favelada*) of the periphery (Jacques, 2006). In both cases self-construction is present, but it seems that the processes can be quite different: in one side the continuous process of building private and public space at the same time in favela, in the other the labour exchange for building houses and space improvements present in settlements such as informal allotments (Chinelli, 1981). The first seems to represent self-organization processes, the latter self-construction dynamics in specific – already defined – areas. It is questioned whether favela’s community constitutes such differentiated spatial models that its dynamics of solidarity may also become distinct. Here the discussion seems to approach how spatial configuration correlates to the underlying structures that originate spontaneous urban life in favela, and, in opposition, formally imposed and monofunctional areas without fulgurous public life (Figure 2).

The dynamic life in the favela seem to be close to that of the so-called “traditional” city (both in European and Brazilian colonial terms), whose commerce often occurs on the ground floor and the upper areas are designated to residence. Here only the less busy streets are intended exclusively for housing, as opposed to the modern city, where zoning distances human activities and formalizes them. Medeiros (2013) recalls that throughout the city’s history we have always



Figure 1. Difference between favela and informal allotment: Rocinha, Rio de Janeiro (left) and Sol Nascente, Brasília (right).



Figure 2. *Spatial contrast between favela (Left: Dona Marta, Rio de Janeiro, Brazil) and social projects in Rio de Janeiro (Right: PAC Social Project, Manguinhos, Rio de Janeiro, Brazil).*

dealt with the two processes in parallel, that of organicity (which permeates the whole history of the “traditional city” and seems to reach the favela today), and that of formalization of space, imposed by prior and regulatory planning.

In this context, it can be said that favela is an informal settlement once it does not follow the urban rules prefigured by the current legislation in terms of land subdivision and street geometry, in the same way that an illegal or irregular allotment follows them, but still recognized as informal for not complying with legal formalities in terms of territory occupation and property. Urban informality implicates, therefore, to assume a relation of absence or inaccuracy, something not happening as would be expected. It is, in any case, a term applied in several contexts – often derogatory, favouring its opposite. Informal settlement, therefore, characterizes the production of space on the margins of urban legality, and despite its strictly spatial focus, this definition seems useful in framing the favela in a larger whole. Since both the favela and the informal community (Jacques, 2006) of a clandestine or irregular allotment (Figure 3) have easily characterized as informal (for example, the spatial arrangement in the slums or informal economy in allotment) the term is assumed to be inclusive. In this, the study object differentiates in its spontaneous and self-organized logic.

The research focuses on space and its ability to organize itself in the most diverse forms, assuming, therefore, that the space of the favela will not be characterized by itself as something good or bad, but something to be observed and understood and which presupposes the existence of a logic, even implicit (Salingaros, 2006).

It starts from the understanding of favela as something in permanent development, breaking with the tradition of perceiving in its informality something undesired, because like the city that embraces it, this is not a fixed state but a space in constant adaptation. This process that materializes over time allows it to adjust according to its own rules and emerging processes that Salingaros (2005) calls self-healing. The author considers that spaces such as favelas should be deeply studied and their spatial logics understood before any intervention, since it already contains useful properties to a proper development as an urban space (2005). Usually understood as spatially segregated fractions of strong organicity, they tend to remain interpreted in their problems and needs, so the inherent potential tends to be neglected or ignored.



Figure 3. *Sol Nascente, Brasília, Brazil.*

3. Theoretical methodological and Technical approach

The theoretical, methodological and technical approach of Space Syntax that structures this research, seeks to re-signify the relationship between space and society, joining both layers in a single system of analysis. By understanding the intricate level of spatial patterns in the city one might find the consequences and antecedents of form and capture the social city in the physical one (Hillier and Vaughan, 2007). In the spatial layout, the theory recognizes two types of determining properties, the intrinsic ones that are related to the elements we see, constructed elements and their appearance (easy to memorize and most striking in our spatial experiences) and the extrinsic ones, whose apprehension is only possible when we move, infer and memorize spatial relations (Hillier, 1999). These extrinsic properties result from the reading of the patterns of organization or configuration and are those that most explain the social dynamics of the place because they allow the understanding of the complex system of potential relations that space represents.

It is intended to identify performance patterns in the interpretation of permeabilities (spaces that can be socially coexisting: public spaces) and barriers (private spaces of restricted use) to the movement, as an element of representation for urban dynamics. According to Medeiros (2013), the analysis regards organization and interparty relationships, as well as reading hierarchies. In a system, such information would be the motor for recognizing most structural and global relations, as well as those more local, presupposing the ability to capture information from the reading of the whole and its parts (Medeiros, 2013). For Batty and Longley (1994), as mentioned above, the understanding of urban patterns involves reading of self-similarities and hierarchies, which are only possible to perceive according to the observation of recurrences or regularities. Space Syntax, throughout its sociospatial information, allows access to recurrences and regularities in urban form, from the perspective of the dynamic information that is potential movement patterns. In terms of procedures, the research developed in three essential moments: 1) literature review and theoretical conceptualization, 2) data collection for the analytical base and production of the cartographic bases, and finally 3) the interpretation of the results and their confrontation with the purposes of the research.

Following the definition of the research object – favela as a spontaneous and self-organized settlement –, a framework of urban informality was defined and in it the type of settlements desired. A list of cities was obtained from the intersection of more populous and most unequal cities (Gini index), and this would be the framework for the desired context for settlements. In

the sequence, for the identification of study cases some visual parameters were important, such as free access satellite images with enough quality to observe the network of pathways.

Once the sample was defined, the analyses were developed based on axial and segmental maps, from which 26 variables were verified between qualitative and quantitative categories for 120 case studies. The analysis of spatial configuration of favela was complemented in two phases of comparison; first with the consolidated data for a) Brazilian cities (Medeiros, 2013) and second, with b) Portuguese organic cities, from a sample of 45 cities (Medeiros, 2016). Once the axial and segment maps were explored, the databases were scrutinized according to the same set of variables, and cut into three distinct categories: complete system, old core (for Portuguese cities) and integration core (main central lines of the system). Regarding the configuration analysis itself, according to Space Syntax, it is necessary to fulfil a set of methodological steps that were structured in the research tools: (1) elaboration of an adequate and consistent cartographic base that allows (2) the modelling of representations, (3) their analytical processing, and (4) the establishment of the correlations and interpretations necessary to reach the research results.

The axial map results from the linear representation of pathways drawn from the fewest and largest straight lines (Hillier and Hanson, 1984) considering all access network through urban system (Medeiros, 2013) – once read in terms of integration it illustrates the potential flows and most central areas. The segment map is obtained from the axial map. However, in this case, the axes are fractioned whenever there is an intersection, becoming an independent unit. This is a refinement of the axial map pondering minimal angular variations in order to interpret them as a continuation of the same path (not a change of direction as in the axial map). The resulted measurements can be illustrated chromatically, resulting in the classic view of an axial map in which the warmest colours correspond to the most accessible spaces and the colder colours the least accessible. For the analysis, 26 variables were analysed, divided into geometrical and topological (figure 4). The research is based on a sample that is structured in two moments of comparison: one contemporary and the other diachronic. The first consists of reading the contemporary favela, based on a set of exploratory clipping for the interpretation of the favela's spatial patterns. The favela was framed in the organic production of the city with the intention of developing the exploration of its current dynamics in a diachronic perspective, deconstructing the idea of phenomenon simply product of contemporary reality. To this end, Portuguese cities were used in the comparative process, whose organic traces of their old nuclei allow the relation between the layout of the favela and that which is a clear example of the organic pattern for cities throughout history.

4. The organic pattern of informality as part of the organic structuring of spaces

Jacques (2006) argues about the space of favela as a benefiting space for the city as a whole, both for its resilience associated with urbanism and for the recognition of its importance in Brazilian urban identity. The capacity and possibility of adapting the housing space to the production of income is incompatible with the legality of the formal city (Jacques, 2006) and clearly more advantageous than the tendency to homogenization of the housing periphery.

The dynamics above are very reminiscent of the so-called traditional city (in European or even colonial terms), whose trade often takes place on the ground floor and housing on the upper, and only the less busy streets are intended for housing only. Medeiros (2013) recalls that throughout history we have always dealt with the two processes in parallel, the one we recognize here as organicity and spontaneous self-organization (which permeates the whole history of the

Table 1. Measures used in research (Loureiro, 2017; Loureiro, Medeiros and Guerreiro, 2017).

	NAME	DEFINITION	SIGNIFICANCE FOR ANALYSIS
IDENTIFICATION	Name	-	-
	Country	-	Location
	Geographic Region (UNESCO)	-	Location
QUALITATIVE	Topography	Flat slope, moderate slope or steep slope	Context
	Size	Large, medium or small (according to kohlsdorf's procedure, 1996)	Dimension
	Position in urban context	Inserted in continuous fabric, Peripheral, or Peripheral on hill	Context
	Position of Integration Core	Most integrated or topologically most accessible ones tend to be internal, Peripheral or Mixed	Centrality
	Form of Integration Core	Linear, Deformed Wheel (Hillier & Hanson, 1984) or Mixed	Centrality
QUANTITATIVE-PHYSICAL	N° of Lines	Total of axial lines in each favela	Dimension
	Area	Favela's area in km ²	Dimension
	Total Line Length	Sum of all lines length in km	Dimension
	Compactness A	Reason between number of lines and area, in lines/km ²	Density
	Compactness B	Reason between number of lines and area, in km/km ²	Density
	Line Length	Mean length of axes in linear representation	Mean length in the street system
	N° of Segments	Total amount of segments in each favela	Dimension
	Total Segment Length (km)	Sum of all segments in the favela, in km	Dimension
	Segment Compactness A	Reason between number of segments and the area of the settlement, in segments/km ²	Density
	Segment Compactness B	Reason between total segment length and the area, in km/km ²	Density
	Segment Length (m)	Mean length of segments in the segment map	Mean block's size
N° of Segment/N° of Axial Lines	Reason between the number of segments and number of axial lines in each favela	Level of orthogonality: an higher number reveals orthogonal tendency (much more segments than axes) a smaller number reveals a non orthogonal, or more organic structure	
QUANTITATIVE-CONFIGURATIONAL	Connectivity	Average of connections per line	Related to an higher or lower quantity of routes and paths
	Integration HH Rn	Mean value of global integration (calculated according to Hillier & Hanson, 1984) representing mean global topological accessibility	It addresses the ability to move easily through space according to configuration, also influencing on land use and main centrality formation
	Integration HH Rn Base 100	Mean value of global integration (Hillier & Hanson, 1984) weighted according to Medeiros, 2013, representing the degree of mean global topological accessibility of studied settlements in a scale from 0 to 100	Addresses movement, land use and main centrality for settlement comparison
	Local Integration HH R3	Mean value of local integration calculated according to Hillier & Hanson, 1984 representing the degree of mean local topological accessibility	Observation of local movement, activities and centralities in favelas
	Synergy	Correlation coefficient between global integration and local integration	Synchrony among local and global parts of the system, affecting on spatial perception
	Intelligibility	Correlation coefficient between global integration and connectivity	Expectation of highly connected lines to be also the highly integrated, affecting spatial perception of place
	NAIN	Normalized angular integration, normalization for the measure of integration in segment maps	Mean values for topological accessibility, enabling settlement comparison without scale distortions
	NACH	Normalized angular choice, normalization for the measure of choice in segment maps	Analyses the through movement of hierarchy of path in the settlement, enabling comparative analysis without scale or size distortions

traditional city and seems to reach the favela today), and that of the formalization of space, imposed by a prior and regulatory planning. The forms of urban illegality here referred to as diverse are the parallel contemporaneity of this reality and seem to be related to the paradigm of formality / urbanity, discussed by Holanda (2002). The work will not focus specifically on the paradigm, but it is hoped to mark the urbanity potential of the favela from the identification of spatial patterns recognized as catalysers of urban life and recognized in the organic city.

With this analysis for the sample of 45 Portuguese cities, observing their old core and integration core, and having confronted all the information with those referring to what Space Syntax has pointed out as structural patterns for favela, it was possible to expose a set of ideas that argue these urban phenomena as similar or distant.

4.1. *Physical structure*

Old centres showed similar areas to favelas on average (0.21 and 0.14 km², respectively, as opposed to the whole city of 5.34 km²), as well as similar maximum and minimum. Favela seems to have approximate dimensions to what would be the oldest core of the Portuguese organic city. However, favelas are substantially denser than these cores (6539.5 to 776.4 lines / km²). The compactness values for favelas are much higher, revealing denser spaces despite the same occupation areas, which may be related to the absence – in the most compact cases – of the block's conformation or with its extreme diversity of sizes. The degree of compactness of the favela, compared to that of the organic city is also related to the type of location most common for the settlements: plan sites inside continuous fabric. Unlike the other analysed systems, favela materializes a space of opportunity in the large contemporary city, a place of access to opportunities that do not exist in the surrounding official peripheries, so the density tends to be very much associated with that intensity of occupation. Favela seems to be able to optimize its spatial relations intensively, transforming what would be the average space for block into only enough distance for one or two buildings. This organicity is expressed in the internal occupancy patterns by means of average segment and axial lines length, revealing reduced dimensions (14.6 m for axes and 9.3 m for segments) and extreme internal variation.

Favela, despite having a fewer proportion of segments per axial lines in comparison to Brazilian city (with 3.21 and favela 2.98), reinforcing the lack of a structure with connections that cross the system frequently, reveals higher ratio than the Portuguese city or its old cores (2.22 and 2.45 segments per axis, respectively), indicating a greater continuity of the traces, than would be expected. Despite the irregularity, the favela studied here is not characterized by the presence of alleys or dead ends. Two items stand out from this finding: on the one hand the topography as an essential role in Portuguese city and its tradition of adaptation to the territory, on the other the density of the streets network stands from the rest, guaranteeing a set of connections inexistent in more consolidated and historical structures. Although exploratory in the selection of cases and in the mode of representation, the sample shows that the favela is characterized much more by the organicity and sinuosity of its structures than by the existence of alleys or dead ends, a situation that contradicts the common imaginary. The favela intensifies the organic pattern in its spatial relationships (as being denser), but it seems to be unrelated to the sinuosity of the structure, once that, in the analysed sample, most favelas are in flat areas. Other important fact is that by searching for optimization of space, the formation of alleys or large blocks are not as favourable as a network of paths that, although precarious, extends to the whole system.

4.2. The topology of favelas and Portuguese historical cities

For connectivity and angular connectivity, favela reveals higher mean values (3.68 and 2.67) than the values for Portuguese cities (2.95 and 2.33), but very similar to old cores (3.64 and 2.58), revealing proximity in the kind of regularity patterns for both structures. Observing the data according to the area of the system, larger Portuguese cores tend to present higher mean connectivity (4.26 for the set of cores categorized as larger), as larger favelas tend to slightly decrease the mean values (3.84 for the set of small slums and 3.10 for the very large slums). This situation might indicate that consolidation processes over time tend to improve connections relation in a way that connectivity naturally develops. Otherwise in the favelas one can point out two particular situations that might correlate to presented values. First, very small systems whose spatiality seems to be distinct from that of larger systems (for instance, in the absence of blocks as discussed). Second, the process of consolidation in emergency situations, frequently in short periods of time, results in less connected systems due to their endogenous character and their diversity of internal scenarios – some highly connected spaces and many less connected, resulting in polarized systems, characteristic of its complexity.

Regarding measures of potential centrality (HH Rn), Portuguese cities (0.71) and their cores (0.79) reveal smaller values, as well as Brazilian cities (0.76), than favelas (1.06). The measure points out that favelas effectively tend to have stronger structuring axes linking the system as a whole, despite the apparent density and profusion of its system. The aspect seems to be related to the size of the systems on one hand and the polarization of values, on the other. Observing normalized values for the same measure (HH Rn Base 100 and NAIN), different nuances are observed that are worthy of attention: (1) the global integration for base 100 (Medeiros, 2013) reveals that favela has the most polarized structure, followed by historical cores (41.19 to favela, 46.25 to Portuguese cities and 44.46 historical cores), so with greater distance between its ends, revealing higher internal levels of segregation possibly by concentrating the integration on a smaller set of rows. (2) When looking at the normalized values by angular weighting and scale, NAIN, a measure that presupposes comparison with less distortions of scale, there is a prevalence of higher values in the favelas systems (0.94), followed by old cores in relation to Portuguese cities (0.90 and 0.83 respectively). This shows that somehow the structuring relations of centrality are stronger in the favela and historical cores, and one might assume that perhaps it retains in its emergent character a clear global organization, possibly due to the development processes, where few axes may be responsible for capturing the full integration of the system. Ultimately, the present stage of favelas seems to give signals that space is structured and follows clear organization patterns, producing stronger polarized centralities.

Observing angular normalized measures for Choice (NACH), which allows observing potential patterns of hierarchy, there is a main or global organizational structure (Hillier, 2016; Hillier et al, 2012) that permeates favela, such as the city. The measure represents the continuity of paths in order to identify the potentially easier movement path, the most chosen pathways by being the smaller topological routes. The result reveals that although apparently profuse, favela seems well organized and distributed in terms choice, there is a balance between local and more structural routes in favela street network. It is of high importance to demonstrate how a rule applied to well consolidated urban spaces (good through and to movement relations) is clearly expressed and structured in favela (figure 4). This reveals how self-organization informality can generate similar patterns to urban spaces, and how organic structures, even informal ones, can retain better organizing rules than other systems.

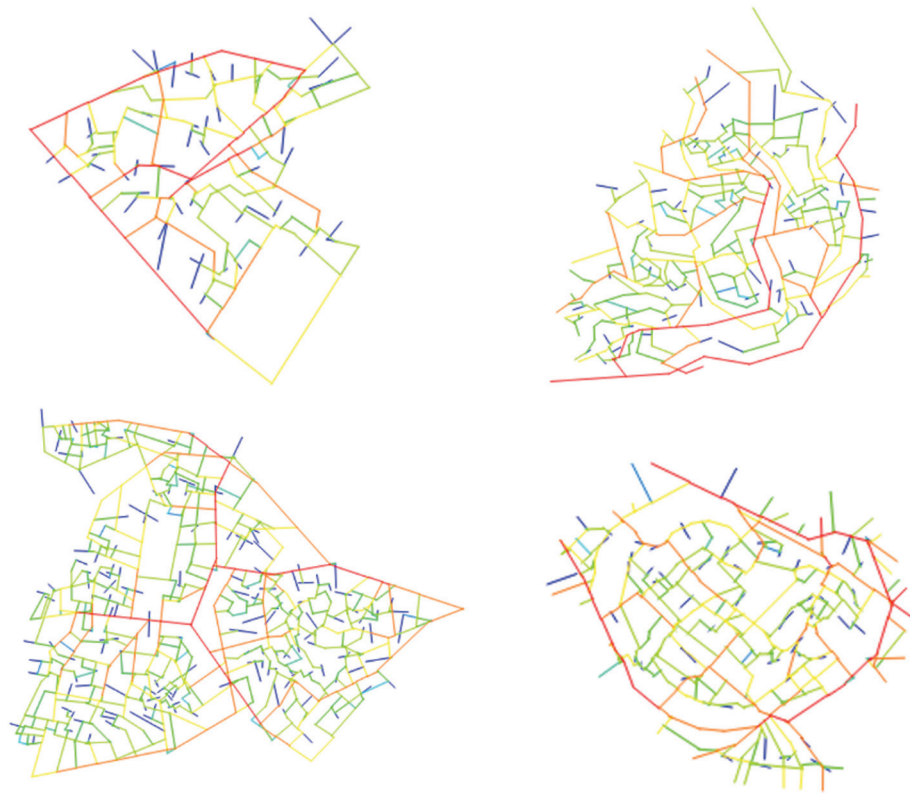


Figure 4. Normalized choice patterns in two favelas (up left: Tiradentes, Belo Horizonte, Brazil; down left: Douala El Koudia, Marraquesh, Marroco) and two historical cores (up right: Covilhã, Portugal; down left: Beja, Portugal)

4.3. Reading topography and centralities in the Portuguese city

Throughout the research, ponderations over topography are crucial and revealing of its importance in the dynamics of self-organized cities and how it implies different performances. Integration cores of Portuguese cities are mainly structured in the shape of a deformed wheel and reproduce categories of centrality associated with the good urban structure (Hillier, 1984, Holanda, 2002, Medeiros, 2013), much different from the inward-facing structures in favelas central lines, which tend to be composed of fewer and less structural/global lines. Topography seems to play a preponderant role in issues such as the size of the old core, however in all topographic categories different integration core models are possible, confirming that organic city does not declines with topography, instead seems to use it in its self-organizing and consolidation processes. At the same time, in favela it was possible to perceive slight declines in the topological performance of the system as the topography is accentuated, associating the higher fragmentation of the system to its impossibility of shaping the network of paths freely in the territory. Nevertheless, it is essential to state that topography accentuation slightly decreases mean values of accessibility in favelas but do not dramatically change the pattern recognition – organicity stills present and similar in all stated measures. Self-organization seems to structure space independently of its topography.

The absence of a peripheral integration core in the Portuguese city is symptomatic of the developing stage of the favela and, mainly, of its natural condition as part of the city and not an independent system. This indicates that in spite of the ghetto feeling and the ghettoization of



Figure 5. – Example of different integration cores of favelas – Segment maps, Variable NAIN. Up left: Tingo, Arequipa, Peru; Up right: PNR Nagar, Bangalore, India; Down left: Musseque 1, Luanda, Angola; Down right: Thideer Nagar, Chennai, India

which it tends to be targeted, its structure seeks in its processes of self-organization some form of connection with the city (figure 5), establishing interdependencies at the same time as it is organized internally by the frequent generation of mixed cores.

Finally, favela presents characteristics of spatial perception similar to those of the old cores. For synergy levels, favela presents similar values to historical cores (55% for favelas, 53% for historical cores, and 49% for whole Portuguese cities), which indicates the similarity in organizing processes and approximate hierarchy levels from the point of view of user. Levels of intelligibility are, however, somewhat smaller, reinforcing the intense organicity of the systems (25% for favelas, 28% for historical cores and 23% for Portuguese cities as whole). This reinforces once again the interpretation of favela as constituted of similar patterns of self-organization in organic systems, seen here according to the Portuguese city. It seems important to reinforce that such comparison has resulted in common patterns between favela and historical cores and not with whole Portuguese city. One finds that such similarity is not present in Portuguese complete urban systems due to the contemporary planning processes that had originated different urban patterns and scales.

5. Conclusion

The presented discussion allowed us to verify what apparently constitutes a morphological explanation for the favela phenomenon in itself, by bringing it closer to the historically constituted

organic cities. Similar processes of self-organization are identified in both types of settlements, which allows us to demonstrate how space organizes itself and its effects on spatial patterns.

Findings lead to two main reflections: favela (1) is a segregated urban space, which spatiality reveals a pattern of occupation less connected and less immediately apprehensible, despite its developing phase (more or less consolidated), and (2) at the same time reproduces almost all the urban attributes necessary for the conformation of good urban spaces and found in cities of organic genesis: strong centrality, good hierarchy potential, structured spatial relations both internal and locally (generation of community) or externally (strong relations to its surroundings), and above all, it assumes a structure that allows a continuous flow within its parts, despite the depth and profusion of its local geometry. Favela structures itself as cities do too, making it possible to infer general lessons about how self-organizing processes are consolidated over time and develop clearer patterns of organization than might be expected.

It is believed that in such type of informality – self-organized one – on can assume to recognize potential levels of urbanity, related to an implicit order that allows space to be configured in order to respond well to the needs of its users. It was necessary, however, to break down built-up assumptions and symbolic values recognized in informality in order to analytically comprehend the properties of these spaces, that increasingly constitute contemporary cities all over global south. Interpreting city dynamics analytically lead to observe spatial forms without prejudice, resulting in important lessons such as self-organizing informality as not an exclusive contemporary phenomenon, but seemingly part of organic cities intrinsic processes. This might surely be important in terms of urgent spatial interventions for sanitary and humanitarian matters, once some structural properties can be recognized and kept due to its proven spatial qualities.

References

- Alexander C. *et al.* (1977), *A Pattern Language Towns Buildings Construction*, Oxford University Press, New York.
- Batty M., Longley P. (1994), *Fractal Cities A Geometry of Form and Function*, Academic Press, London.
- Chinelli F. (1981), *Os loteamentos da periferia*, in Valladares L. do P. (org.), *Habitação em questão*, Rio de Janeiro, Zahar, pp. 49-68.
- Davis M. (2006), *Planeta Favela*, Boitempo, São Paulo.
- Guerreiro R. (2010), *Urbanismo Orgânico e a Ordem Implícita: Uma Leitura Através das Geometrias da Natureza*, Tese de Doutorado apresentada em 2010, ISCTE-IUL Escola de Tecnologias e Arquitectura.
- Hillier B. (2016), *What are cities for? And how does this relate to their spatial form?*, in *The Journal of Space Syntax*, Volume 6, n.2, p. 199-212.
- Hillier B., Hanson J. (1984), *The Social Logic of Space*, Cambridge University Press, Londres.
- Hillier B., Yang T., Turner A. (2012), *Normalising least angle choice in Depthmap – and how it opens up new perspectives on the global and local analysis of city space*, in *Journal of Space Syntax (JOSS)*, Vol. 3, n. 2, p. 155-193.
- Hillier B., Vaughan L. (2007), *The city as one thing*, in *Progress in Planning*, vol. 67, n. 3, pp. 205-230.
- Holanda F. (org.) (2012), *Ordem & desordem: arquitetura & vida social*, FRBH, Brasília.
- Holanda F. (2002), *O Espaço de Exceção*, EdUnB, Brasília.
- Holanda F. (2010), *Urbanidade: Arquitetônica e Social. Anais do I ENANPARQ (CD-ROM)*, PROURB, Rio de Janeiro.
- Jacques P. (2002), *Estética da Ginga*, Casa da Palavra, Rio de Janeiro.
- Jacques P. (2006), *Learning from Favelas*. In Nunes, Brasilmar Ferreira (ORG.), in *Sociologia de Capitais Brasileiras: Participação e Planejamento Urbano*, Liber Livro Editora, Brasília, pp. 179-202.
- Leeds A., Leeds E. (1978), *A Sociologia no Brasil Urbano*, Zahar Editores, Rio de Janeiro.
- Loureiro V.R.T. (2017), *“Quando a gente não tá no mapa”: a configuração como estratégia para a leitura socioespacial da favela*. Brasília. Tese – Programa de Pesquisa e Pós-Graduação da Faculdade de Arquitetura e Urbanismo da Universidade de Brasília.

- Loureiro V.R.T., Medeiros V.A.S. (2014), *Is there a transversal organic pattern? Favela and its diachronic relations*, International Seminar on Urban Form, Porto: FEUP.
- Loureiro V., Medeiros V., Guerreiro M.R. (2017), *Configuration of self-organizing informality: socio-spatial dynamic in favelas*, in Teresa Heitor, Miguel Serra, João Pinelo Silva, Maria Bacharel, Luisa Cannas da Silva (Ed.), *11th International Space Syntax Symposium*, (pp. 1-17), Lisboa: Instituto Superior Técnico, Departamento de Engenharia Civil, Arquitetura e Georrecursos, Portugal.
- Medeiros V.A.S. (2016), *Uma herança do ultramar 05: análise da configuração urbana em cidades lusófonas*, Research project, Brasília.
- Medeiros V.A.S. (2013), *Urbis Brasiliae: o Labirinto das Cidades Brasileiras*, EdUnB, Brasília.
- Pasternak S. (2008), *A favela que virou cidade*, in Cidade (i)legal. Valença, Marcos Morais (edit), Rio de Janeiro, Mauad X.
- Salingaros N.A. (trad. Livre Salomão, L.) (1998), *A Teoria da Teia Urbana*, *Journal of Urban Design*, vol. 3, pp. 53-71, Taylor & Francis Limited.
- Salingaros N.A. (2005), *Principles of Urban Structure, Design Science Planning*, Techne, Amsterdam.
- Sobreira F. (2002), *A Lógica da Diversidade: Complexidade e Dinâmica em Assentamentos Espontâneos*. Recife, 2002. Tese (Doutorado em Desenvolvimento Urbano) – Programa de Pós-Graduação em Desenvolvimento Urbano, Universidade Federal de Pernambuco, Recife.
- Valladares L.P. (ORG.) (1981), *Habitação em Questão*, 2ª Edição, Zahar Editores, Rio de Janeiro.
- Valladares L.P. (2005), *A invenção da favela: do mito de origem a favela.com*, Editora FGV, Rio de Janeiro.

