Understanding and Representing Urban Heterogeneity: The Case of Waste Collection in São Paulo

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Abstract

How is it possible to take into account the architectural and urban complexity, which encompasses multiple issues, from technical ones to social or sensory ones, within an integrated research process? How is it possible to combine multiple disciplinary approaches (cultural, social, environmental, urban, and design) and scales (from the body one to the district or the city ones) with a single representation means? And finally, what kind of method can address these complex problems and however remaining "thrifty"?

In this paper, we will describe a recent exploratory research work that intended to address all these issues at once. The main result consists in proposing an integrated methodology for analysis and representation. In our view, considering together these two domains is a way to take into account multiple research fields without having a more influential one, by keeping strong ties between field observation and results construction. In the end, graphic representation appears to be not only a means (for describing, understanding, planning and so on), but also a proper result to the architectural and urban research realm.

A specific research process made to deal with urban complexity

As the paper's title suggests, we intend to consider urban area as something that deals with heterogeneity and complexity. Indeed, urban space, as well as cities, brings together constructions, networks, people, environment, policies, flux and so on. For that reason, research on such space proceeds from differentiated disciplines and epistemologies. There arises a question we will to ask: how is it possible to take into account several matters – which are constitutive of cities, as well as of everyday dweller's experience – in a single process? Furthermore, how is it possible to address environmental, urban and lived-experience issues at once, knowing that such domains already drive their own sciences and practices?

Situated in the field of architectural and urban atmospheres (or ambiences), which crosses disciplinary boundaries by encompassing perceptible, social and built space, we tried to address this problem in an ongoing research work which assumes that it is doable to encompass multiple dimensions, problems and point of views through the single means of graphic representation. We can go as far as to say that graphic representation is expected to function as a common language between approaches that produce knowledge on space – despite their differentiated methods, theories or even epistemologies. Given that, we shall ask what kind of result could be obtained from a sociologist, an atmosphere scientist, an urbanist, a political scientist, an inhabitant, etc. who are asked to draw together on a unique sketch concerning a particular area of study?

In despite of having tried to make scientists drawing and designing, we implemented a method that makes use of graphic representation in order to provoke debate between inhabitants, scientists and experts, designers and political representatives on a particular area of study: the case of domestic waste in São Paulo (Brazil)[i]. Our objective consisted in finding a way to understand and represent architectural, urban, social, environmental and sensory issues linked to this case, in terms of relationships between inhabitants and garbage, considered at different scales.

Methodological & Design Hypothesis

Having in mind the will to gather, understand and represent a multiplicity of relationships between man and air (or atmosphere, or ambience, depending on the chosen focus), the design hypothesis is to draw urban sections of studied area. This graphical hypothesis is driven by the impossibility for plan view (i.e. maps) to represent air and people relationship to it, as well as situated practices. At the contrary, sections allow representing air, bodies, and built forms at any scale: from usual architectural section to landscape section. Such a proposal allows thereby representing sensory dimensions at a large scale.

Also, before representing arises the problem of data collecting. Willing to put together particularly different kinds of data and approaches we needed to choose a method that is able to put together:

-   objective and subjective data,
-   "environmental" and "sensory" analysis,
-   "overhanging" and engaged point of views.

To do that, two ways were followed:
-   concerning "objective" data (i.e. related to environment, built forms, measures etc.): taking into account of already constituted knowledge such as maps, official measures, technical and research reports,
-   concerning "subjective" data (i.e. practices, inhabitants narratives etc.): producing original enquiries (that we will develop further in the next chapter).

By doing so, we take account of the "objective" data in order to constitute a *context*, in which we dispose "subjective" data then describing *situated practices and stories*. These data are collected thanks to inductive methods in order to stay as close as possible to situated narratives.

Following the ways opened by American anthropologists from the 40's and 50's, inductive methods were notably formalized theoretically within the works of Howard S. Becker, or Anselm Strauss[ii]. Inductive approaches allow to situate (to put into context) people accounts and practices. Indeed, in this work, people narratives and practices make especially sense if they are located because it seems to be an appropriate way to understand and represent the urban heterogeneity. This means that the work on site possesses a primary position. The analysis results then from the data, pictures, statements and explanations of people living and working (…) gathered during the fieldwork. The knowledge of the place emerges from the place itself. The analysis and the representation are linked and take place in the same drawing process.

Retracing São Paulo Waste's narratives

What thus does it mean to approach by inductive means, issues related to waste in an agglomeration such as São Paulo? We approached this topic by trying to understand the "story of domestic waste", starting from their production at inhabitants places to their ending at sanitary landfills. Three objectives drove the fieldwork:

-   Retrace waste's stories: by interviewing inhabitants, local experts and administrators; visiting waste treatment factories and sanitary landfills; following garbage trucks, and so on.
-   Understand local and global controversial issues linked to garbage.
-   Represent space, waste's stories, and environmental, "atmospherical", social and architectural issues at the same time.

For that, the "waste's narratives" were collected from their production places to its end, in one of the city sanitary landfills. Through the topic of waste's stories, the urban heterogeneity and complexity are reached, involving many spatial scales and numerous stakeholders. Indeed, there are many levels of understanding the waste's narratives.

From the global city level…

São Paulo is the greatest metropolitan area of South America. In the year 2009 the city counted more than 11 million inhabitants and spread out 1523 km². Because of its huge dimensions we could not take the whole city for an object of study.

In order to understand and represent the topic of waste's story we focused on the journey of garbage trucks, from city center to the sanitary landfill, passing by a key place. This place, called *Transbordo*, is an open building where little trucks gather the waste and transit it into bigger trucks. This journey is about 35 kilometers and it takes around one hour to drive, depending on the traffic. The main road, and its surroundings have been considered more as a continuous space-time line than as an area of study. This journey is the larger scale of the research object.

By considering this scale, we were looking for potential differences between the various districts crossed by the journey of waste.

Along this road, how is the waste's story evolving? Do the urban shape, the street mesh, the legal or illegal status of the constructions, and the social and economical levels of the populations have an impact on the waste management?

Are there some places where the waste management question is more controversial than some others?

…To the local and individual level

We also wanted to understand and represent the story of the waste from local and individual points of view.

How inhabitants deal with the waste? How does the connection work between the inside of the buildings and the public space of the street? What is the transition between private management of the trash and public waste management? Are there some intermediate stakeholders between inhabitants and waste management workers?

In addition, we wanted to reach the understanding of the particularities in the different districts crossed by the waste's journey. We were wondering about the nature of the impact that waste topic has on the ambience of the place.

How the rhythms created by waste (like the frequency of waste collection) have an impact on the inhabitants' or streets' or districts' life? What are the material and immaterial spaces taken by the waste? Does it have a negative impact on surroundings (bad smell, animal attractiveness, air pollution…) and how people deal with that? What kind of differences can we notice on waste management by people living in collective buildings and people living in single houses?

We didn't want to address all these problems in a global way. First of all, in order to grasp the ambiance of the places we had to focus on body scale and then to go on

site. Also, we were not technically able to approach this phenomenon from a big scale (and are not convinced of its necessity and/or accuracy). We could benefit from ten days only to follow the waste's journey, go on site, make the fieldwork (photographic survey and interviews) and then, analyze the data and represent it.

In order to study several declinations of the waste's story along the main road taken by the waste trucks from the city center to the sanitary landfill, we decided to select and focus on four different streets. These streets are situated along the main road. From them we will draw four urban sections.

The selected streets present different aspects. First of all, the places are at different distances from the city center. Two of them are close to the historical center of São Paulo, and others are few kilometers away from the sanitary landfill, at the East of the metropolitan area.

We can also see certain differences like the accessibility of the district, the urban shape, the period of urbanization, the waste collection system and devices, the economical situations of the population, and the more or less legal status of the constructions.

In order to gain knowledge about individual behavior linked with waste topic we selected these places by the possible interviews that we could arrange.
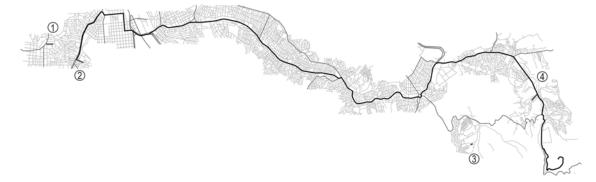
Selected places of study

Figure 1: Map of East part of São Paulo agglomeration. The thickest line represents the way followed by garbage trucks from transbordo (#2) to sanitary landfill (spiral at the right end of the line).

Vila Mariana (#1 on Fig. 1 and 2) is a central neighborhood in São Paulo. Rich buildings and houses are located along a sloping street. We were able to interview someone living in a rich and secure building where the access is controlled by a guard. We also interviewed a employee of this building who's job is to collect twice a day the waste on every doorsteps, to stock it and select it in the basement, and carry it out on the collecting days (three times a week).

Figure 2: Block plans of the four selected neighborhood. The sections lines are represented in black.

Santos-Imigrantes (#2 on Fig. 1 and 2) is further away from the city center. The *Transbordo* is located in this neighborhood. We interviewed there an inhabitant and an employee of a wealthy condominium and a woman living in a house who is a member of an association fighting against the *Transbordo* because of its negative impact on surroundings. This controversial issue moves the district's life.

The *favela* São Francisco (#3 on Fig. 1 and 2) is the frame of the third urban transect. This slum is an illegally urbanized site counting numerous poor habitations. This district is hardly connected to the road network system. In this place, waste collecting devices have been placed depending on the possible access points. Indeed, there are only two garbage disposals for the whole population. We interviewed a couple of inhabitants and a social worker.

And finally, São Mateus (#4 on Fig. 1 and 2) district is situated closely to the sanitary landfill. This fourth urban transect crosses an old favela where construction has been legalized since about twenty years.

From waste's narratives to their representation

The use of urban sections has been developed in some other research works before the São Paulo study case. One of the difficulties revealed by these previous works is that technical drawing of architectural section is somehow not easy to be understood by everyone (even for architects or urbanists, this mode of representation remains sometimes hard to understand at a first glance). There is a graphic code that needs to be known by the viewer, and some people who are not familiar with this representation code misunderstand the drawing.

Furthermore, we didn't have access to any blue prints, detailed maps of São Paulo or construction licenses files. We then didn't choose to draw detailed and technical sections of the urban reality. Instead, we decided to represent the profile of the four selected streets for technical and communicative reasons in order to be understood by everyone.

Representation method is closely tied to the fieldwork we have done. We went only one time on site and consequently needed to be very careful about the fieldwork. The same work method occurred for every urban transect. On site, we chose the exact path of the transect, took precise pictures in order to create photographs collages, interviewed inhabitants, employees dealing with waste management, local

experts and administrators. We located particular shapes, dimensions and spatial situations of garbage cans, and took information concerning time and type of waste collection. We also tried to understand the potential environmental impact, the ambience created by

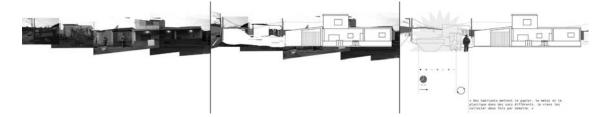the waste's story, and the controversial issues specific to each place.

Figure 3: Three stages of section construction: 1/ photographs collage; 2/ drawing shapes and background; 3/ placing people, uses and discourses.

From field surveys to section construction

After obtaining all these data we started the section representation. First, we created the photograph collage for each urban section that would be the base of the drawing. From this photograph collage we drew the street profile. The drawing, consisting of simplified representation of buildings, doesn't have every architectural details, but it allows to apprehend the global urban shape. Architectural volumes and their apertures (doors and windows) give information about the rapport to the street.

At the second plan, we represented the background shape, in order to understand the urban context, and contrasts with the street is the object of study. Thanks to this background we can see if the urban density of the neighborhood is low or high, if the street is surrounded by natural or urban components.

Then, we decided to place the electricity poles to show the unity and the continuity of the street. We also decided to trace over cars in order to be able to understand the existence of parking places, circulation or pedestrian areas.

We also placed the garbage cans so that we can understand their implication on different levels. It doesn't involve the same things if the nearest garbage can is at the doorstep, in the building's basement, in the street or in the next street. For example, at São Francisco *favela*, there are only two garbage cans that are situated at the end of the urbanized area. It is not the same situation

that in Vila Mariana's building, where inhabitants can put down their personal waste on the doorstep. In that case, inhabitants' contact with waste is shorter and requests less effort. At one place people just need to open their door, at the second, they need to walk about ten minutes and by any weather. People interviewed at the *favela* explain that the geographical situation of the garbage cans has some environmental impacts: sometime, some people prefer to trough their waste in the river next to their home because it is closer than the garbage can. On the other hand, people are recycling directly the waste, selecting food waste to give to their chickens.

Then, we tried to translate discursive information selected from interviews to understandable drawing elements. Two kinds of stakeholders are represented in the urban transects: inhabitants and employees dealing with waste management (truck drivers, building's cleaning employees, *Transbordo's* administrators...). Every person drawn in the urban sections represents someone who we interviewed and who has given us some precious information about his professional or dwelling habits. A graphic transcription of temporal information concerning waste collection indicates the time and frequency of it (private or public collections). The same for the nature of waste: have they been selected or no?

Finally the urban transect is a hybridization of different type of information concerning the place: inhabitants and workers speeches retrace the past and present story of the place, drawings give a representation of the physical morphology of the space, measures indicate the temporality linked to waste's topic.

A hybrid tool for spaces of complexity: representing for understanding and debating
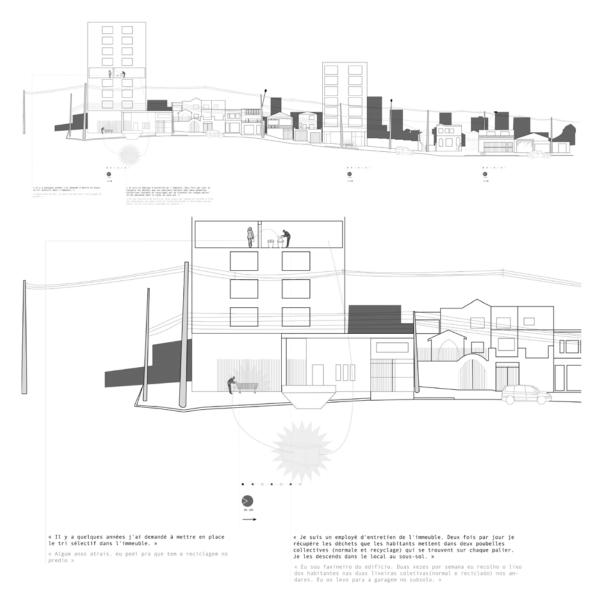

Figure 4: Section #1 – Vila Mariana: Full section and zoom. The length of the printed drawing was over 2.5 meters.

At the beginning of this paper, we asked ourselves what kind of graphic representation could result from a design process in which actors with different expertises and different relationships to the field would be able to draw?

The main result consists into bringing our fieldwork results through design by representing different but interwoven understanding levels (related to space, uses, atmosphere, environment, policies) by the way of a

unique graphic means, thereby without needing additional layers, related notes or whatsoever.

The figure 4 (above) shows one of the sections we designed. In this one, we see: a street, built profiles, the inside of a flat, garbage cans, people and their practices, words of people, timetables of garbage trucks and so on. The chosen mode of representation allows speaking for these different types of data, thus mixing different kinds of approaches from technical or political ones, to situated narratives. However, this section is very simple and seems to show a lack of information. This has to do with two expectations we had:
-   showing a synthesis of the information collected in order to avoid to surcharge the view,
-   leaving some empty space in order to let viewers shifting from this role to a more active one (e.g. by giving the possibility to draw, or write on the section).

These two expectations are related to the will to make use of the sections not only as a descriptive means, but also as a public debate tool. We tested this hypothesis by presenting the sections in a public seminar in São Paulo a couple of days after having it produced, and it indeed provoked discussion. Two main positive results emerged from this public presentation:

-   people that are not familiar with architectural representation were able to understand the sections very easily because of their non-technical appearance;
-   people were thus able to identify themselves to the represented neighborhood and started immediately to talk about their own experience to complete the sections or to refute what they are showing.

Furthermore, another point emerges from these representations. At the opposite of the map, or of the classic architectural and technical section, the sections are not panopticons. They do not give the possibility to see and understand everything at once. Indeed, the linear representation of urban sections created from the streets profile, and the inscription of situated people narratives implies to take time to read the drawing, and to move around to have close or wide views. Then, people who face these documents used to shift from being spectators, to be active readers, or even actors of these. Such a process allows the introduction of a cinematographic dimension in the representation that is not linked to the fact of drawing panoramic views. The necessary linear reading of the drawing introduces

indeed a narrative dimension created by the spectator/actor him or herself. Maybe, the next step of such a comprehensive method for understanding and representing is to be usable for participative city planning.

Notes

[i] This work is part of a wider research program dealing with atmosphere related issues: Nicolas Tixier (dir.) *et alii*, L'ambiance est dans l'air. La dimension atmosphérique des ambiances architecturales et urbaines dans les approches environnementalistes. Research contract PIR Ville et Environnement – CNRS – PUCA, 2008-2009. The project is still under way (2008-2010). www.pirve.fr
[ii] BECKER H.S., « Inférence et observation participante. Fiabilité des données et validité des hypothèses » In Cefaï D. E., L'enquête de terrain, Paris: Éditions de La Découverte/M.A.U.S.S., 2003, p. 350-362 ; STRAUSS A., *La trame de la négociation. Sociologie qualitative et interactionnisme,* Textes réunis et présentés par Isabelle Baszanger, Paris: L'Harmattan, 1992, 319 p.