Barrio morphology and private space: the social drivers of informal urban settlements in Caracas

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Abstract. *Urban morphology has historically been studied through the physical characteristics of a particular space. However, the urban form of a place is also influenced by relationships and social contexts. Therefore, this paper discusses the social processes that drove the construction of private space in informal settlements in Caracas, thus defining the barrio morphology. A qualitative approach was undertaken, including observations, interviews and a photographic survey of a case study area. Interpreting participants' perspectives and stories of their experiences during their barrio's development revealed the social processes underpinning the shaping of the barrio. The tense and conflictual relationship between people and the government through evictions led to squatting: solidarity and neighbourly relationships drove the selection of the place and its consolidation, and the barrio became dense through supporting family relationships. The form of the barrio space arises as a reflection of these social processes.*

Keywords: informal settlements, barrio urban form, private space, social processes, Caracas

This paper reflects critically on the social processes that have influenced the construction of private space in *barrios* and, consequently, their urban forms. Through interpreting residents' accounts and focusing on the house as a constituent of the *barrio*, it highlights how phenomena such as eviction, solidarity and support, and different relationships – ranging from the macro to the family – drove the morphological development of the place.

Urban morphology can be understood as the processes of the creation and transformation of urban forms over time (Chen, 2014; Lilley, 2009). Streets, blocks, plots, and buildings are the fundamental elements of the built form (Kropf, 2014). The form of informal settlements comprises a mix of informal architecture and informal urban design. The former usually involves buildings that 'may appear chaotic and random while also embodying an underlying order of single-room accretions' (Dovey and Kamalipour, 2018, pp. 226–7). Informal urban design often consists of 'crooked, inconsistent and rhizomes interconnections of streets various widths' (Dovey and Kamalipour, 2018, p. 227). These forms are most common in Latin American cities. Both informal architecture and urban design are outcomes of community organization and incremental self-adaptation to physical and contextual conditions.

Traditionally, informal settlement morphology is less well-studied than that of formal areas (Buraglia Duarte, 2009; Kamalipour,

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2016). The urban form of informal settlements has been studied around the world, especially in Asia and Latin America, with a strong focus on its categorization based on its location in relation to the city (Dovey and King, 2011). However, as McCartney and Krishnamurthy (2018) have stated, analysing the built form of informal settlements is not just about location, housing typology, road networks and other connections: the intangibles that led to its construction also need to be taken into account in order to understand its form. The emergence of urban form is fundamentally a social and cultural process evolving from the growing relationship between a group of people and their surroundings. However, this relationship between urban form and social structures is little researched (Kamalipour and Zaroudi, 2014; Scheer, 2017; Xiao, 2017).

This paper addresses this literature gap by discussing the social processes that drove the morphogenesis of the informal settlements of Caracas through the interpretation of residents' stories of eviction, solidarity and support linked to the development of the private space.

Barrio origin and evolution

In many Hispanic countries, the word *barrio* typically translates to neighbourhood, and there are other terms for informal settlements such as *favelas*, *villas miseria* and *conventillos*. However, in Venezuela, *barrio* refers specifically to informal settlements (Dovey and Kamalipour, 2018). In this sense, *barrios* and informal settlements are the same construct; however, as Venezuelans call these areas *barrios,* this paper adopts the term. The use of the terms 'informal' and 'formal' when discussing *barrios* and the cities in which they exist is controversial as they perpetuate colonialist views on these areas (Varley, 2013). This formal–informal dichotomy is often defined by the quality of the morphological and physical components in architecture (buildings) and urban design (streets and blocks) (Dovey and Kamalipour, 2018). However, this does not imply a clear distinction, as the 'informal and formal are always intertwined' (Dovey and Kamalipour, 2018, p. 224).

Informality can be considered as 'the violation of land use regulations' (Roy, 2005, p. 149), which implies that these settlements – *barrios* – are incrementally built by people through non-compliance with official (formal) planning processes and codes (Dovey and Kamalipour, 2018; Huchzermeyer, 2010).

Informal settlements have developed over decades, with a great investment of time, emotion, money, and effort from their residents, along with official and unofficial support from the government and politicians (Bolívar and Pedrazzini, 2008; Hernández García, 2013; Lombard, 2014; Trigo, 2008; Wiesenfeld, 1997, 2001). These areas are usually located in city outskirts or within cities, and arise due to the inability of the government and the private housing market to provide for people living in poverty (Bolívar and Pedrazzini, 2008; Davis, 2006; Turner, 1976; United Nations Human Settlements Programme, 2003). This phenomenon started in times of rapid and uncontrolled city growth (Davis, 2006; United Nations Human Settlements Programme, 2003).

Large-scale population growth was linked to inadequate housing and people finding shelter through their own means, leading to squatting (Turner, 1976), often on publicly-owned land (often zoned as green or special areas), and in areas that the formal market deemed undevelopable (Bolívar and Pedrazzini, 2008; Dovey and King, 2011; Hernández García, 2013; Kudva, 2009). Consequently, the urban form and structure of informal settlements is tied both to the terrain's characteristics and bottom-up decision-making processes (Chatterjee, 2018).

When discussing the *barrio* named Mamera – a typical escarpment in Caracas – and the form of Caracas's *barrios*, Buraglia Duarte (2009, pp. 138–9) states the following:

> The tissue is configured in a predominantly organic pattern, reflecting a degree of adaptation to the steep slopes on which it is located. . . . Both settlements [discussing Mamera and another in Bogota] have poor

> links to neighbouring settlements and to the main communication systems of the rest of the city . . . in Mamera the enormous variety of plot shapes encourages even greater architectural variety . . . there is a predominance of units with 2 or 3 floors and little or no interior free space.

Barrio development stages in Caracas

The *barrios* of Caracas are classified as informal architecture and informal urban design, where people incrementally built both, the latter arising from the former (Dovey and Kamalipour, 2018). Usually, in informal settlements, 'buildings are constructed first, and the street, plots, and blocks emerge over time along with informal codes' (Dovey and Kamalipour, 2018, p. 225). Thus public open spaces are often regarded as the leftovers of the private space (Hernández García, 2013; Segre, 2010).

As Rosas Meza (2009) and Bolívar (1998) indicated, this progressive development of *barrios* comprises three stages: 1) squatting, 2) consolidation, and 3) densification. During squatting, several families or individuals move onto available land, find a spot, and build an initial shack. In Venezuela, this initial construction is called a *rancho* (Figure 1) and is considered the first development stage of *barrio* houses (Rosas Meza, 2009). In that initial stage, people subdivide the land, immediately occupy it, and build their shack. *Ranchos* are typically built in collaboration with neighbours using salvaged materials, such as tin, cardboard, timber, and clay (Ontiveros, 1998; Rosas Meza, 2009). From a psychosocial perspective, this stage usually embeds uncertainty and insecurity due to the risk of being evicted by the government.

Once families are settled in the space, and the fear of evictions decreases, the consolidation process begins as a step-by-step substitution of the *rancho* with a more robust house constructed with reinforced concrete, brick walls, and cement floors (Ontiveros, 1998; Rosas Meza, 2009; Trigo, 2008; Wiesenfeld, 1998). The original, impermanent and changeable, squatter settlement becomes a permanent area in the city and houses grow, typically occupying the whole plot and reaching neighbouring houses, the asphalt of the street, or the pedestrian paths.

Figure 1: *Rancho* and land demarcation in the squatting stage of Barrio Bolívar in Petare (source: downloaded from a publicly accessible but now inactive Facebook group dedicated to Petare).

Densification is the final development stage of the *barrio* built form, which begins once the *barrio* is consolidated (Wiesenfeld, 1998). As there is no further room to spread, people begin building upwards. *Barrios* grow from 1–2 storey houses to 2–5 storey buildings (Bolívar and Pedrazzini, 2008; Rosas Meza, 2009).

Several social processes underpin these three development stages. As McCartney and Krishnamurthy (2018) explain, the social and situational/contextual aspects are vital in the construction of informal settlements and, consequently, in the development of their physical forms. The following sections will identify and discuss these social and contextual phenomena focusing on a *barrio* in Caracas.

Research approaches

Urban morphology has traditionally been studied through analysis and interpretation

of the built environment, particularly the spatial relationships between the buildings, open spaces, road and green network, land uses, and other relevant urban elements (Dovey and King, 2011; McCartney and Krishnamurthy, 2018). Sometimes people's activities, movements, and uses of the space are incorporated into the analysis to define and describe the morphology of a space and how people have had an impact on it (Kropf, 2018).

This study adopted a qualitative approach which engaged with *barrio* residents in order to understand their perspectives and stories about the urban space in which they live and the social processes and relationships that had an impact on its evolution. A case study approach allowed an in-depth analysis of the intangible drivers of the urban form. This research focuses on two areas: a *barrio* of Caracas, Petare, and its neighbouring territory La Dolorita, into which some North Petare residents were displaced. The two main selection criteria were that the area's urban form was representative of *barrio* forms in Caracas (fine-grained, compact urban fabric adapted to the steep topography), and the researcher being acquainted with a community member before the data collection stage.

Petare and La Dolorita are located in the easternmost hills of the San Francisco Valley, where Caracas sits (Figure 2). Petare is one of the largest conglomerates of *barrios* in Latin America (Silva *et al*., 2016). La Dolorita is a neighbouring *barrio*, which originated partly because of the displacement of people from North Petare. These two areas have entwined histories that have led to such strong links that they can be considered as a single case study. As Petare grew and people were displaced after forced evictions to squat in La Dolorita, they remained linked to Petare due to the basic facilities being located there. Additionally, as La Dolorita developed, its inhabitants still had to traverse Petare to access the city (Gómez Castillo, 2009; Méndez B., n.d.). Petare and La Dolorita lie within the same political-administrative and ecclesiastic boundaries; therefore, based on participants' guidance, the data were collected in both, considering them as one case study.

Participant observation and photographic surveys were used to examine the form of the study area. In-depth interviews with 38 residents from different generations and localities within the area allowed the interpretation of the social processes driving the *barrio* morphology.

Figure 2: Location of Petare and La Dolorita to the east of the San Francisco valley (Caracas) (source: based on Google Maps satellite image).

Morphology of the *barrio*

Specific policies led to displaced people living in poverty needing to squat, which was mainly on the surrounding steep hills in Caracas. Consequently, the houses were adapted to the topography, generating a 'layer' of housing that embraced the mountain contours. The houses acquired a fine-grained, compact pattern (Figure 3), and Petare and La Dolorita are examples of this urban tissue. The topography of Petare and La Dolorita ranges from mild slopes with a 10 per cent inclination to areas with over 40 per cent inclination (Figure 4).

Figure 3: *Barrio* built form: fine-grained, compact pattern overlaid on topography in Petare, Caracas (author's photograph).

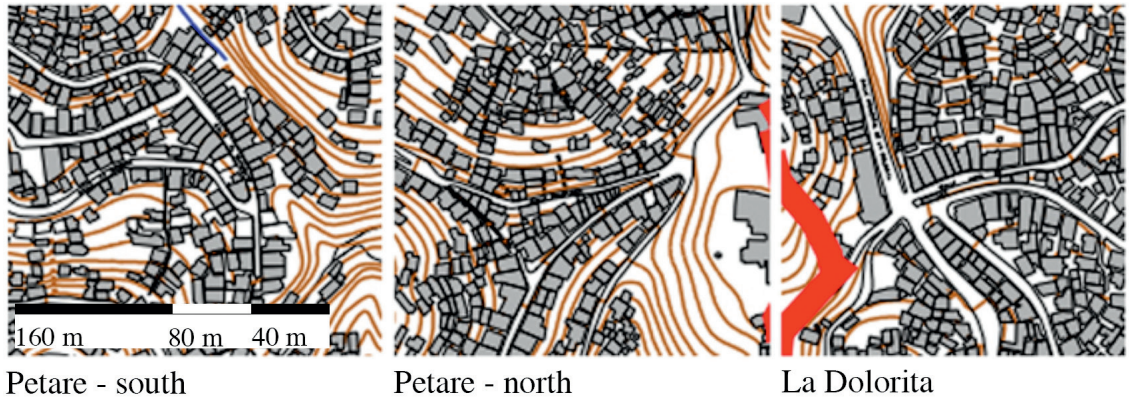

Figure 4: Contour map of Petare South, Petare North and La Dolorita : contours at 5 m intervals (source: based on the base map from the Institute of Urbanism, Universidad Central de Venezela database).

Figure 5: Satellite view of Petare (source: Google Maps satellite image).

The plots, buildings, and streets of the *barrio* urban form vary in both frontage and depth. Throughout the consolidation stage, all buildable spaces were occupied, leading to a dense and compact footprint that can be seen in Figure 5. This Figure also illustrates the paucity of open spaces (mostly streets) and green spaces, the latter usually occurring where the topography is too steep for building.

Currently, the average house has a frontage of 5 m, and its depth can range between 5 and 10 m. Due to the intense plot coverage, it is only possible to grow vertically, as the densification stage suggests. In Petare and La Dolorita, houses have, on average, two to three stories; however, buildings of up to five stories can be found. Figure 6 illustrates these average characteristics. Customarily, the height of each level is 2.4 m, which is the Venezuelan standard.

The main roads are, on average, between 6 and 9 m wide; although, because of the topography, their width is not consistent. For example, in La Dolorita, the main road varies from 5 to 9 m in width within a 50 m section. Main roads often have narrow sidewalks that have been added after the consolidation or densification stages. However, footpaths are uncommon; some of the streets are paved but, more often than not, they are just gravel surfaces (Figure 7).

The pedestrian network in *barrios* also comprises both pedestrian paths and multiple staircases to allow movement through the steep topography. These elements are usually 1 m wide but can be wider or narrower to adjust to the houses. The stairs are not consistent in their rise and tread, as these adjust to the topography: in some cases, with a 50 cm rise and 12 cm tread. The adaptation of the streets and pedestrian network to the extreme topography have generated an organic street pattern leading to an undefined block pattern.

This *barrio* morphology was driven by several forces, ranging from limited financial resources; elevated housing demand; scarce social housing supply; and social processes such as government evictions, community solidarity, and family support.

Social processes driving the *barrio* form

The three *barrio* development stages of squatting, consolidation, and densification were driven by diverse social processes

Figure 6: View of street, building heights, and frontages from a participant's house in Petare south, Caracas (author's photograph).

accompanied by different types of relationships that shaped the *barrio* built form. Social processes and relationships are significant in shaping the morphogenesis and development of the *barrio*. These processes and relationships are identified in the residents' accounts and how they overlap with the development stages is synthesised in Figure 8.

This matrix of stages, processes, and relationships shaped the *barrio* built form. The processes of eviction led to squatting and the formation of the *barrios*. During this stage, processes of solidarity arose between acquaintances and neighbours that led to the consolidation stage. Family relationships were instrumental in all these stages; however, they became highly significant in the densification stage. These three stages and their embedded social processes and relationships were the stepping stones to the current *barrio* form.

Squatters, government and evictions

These first social processes and relationships relate to the macro scale of the origin of *barrios*. This macro level includes the initial squatters who arrived from different places, and their conflictual relationship with the government. This relationship heightened the power imbalance in which governments enforced their power by evicting people, as one interviewee, 'M', suggested:

> M: . . . when Caldera began evicting people from *barrios*, because . . . he was going to

Figure 7: (left) Main street with sidewalks in La Dolorita; (right) Gravel road in La Dolorita, Caracas (author's photographs).

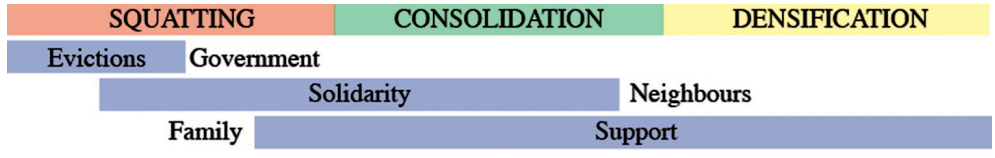

Figure 8. Diagram of stages, social processes, and relationships.

> build some houses around that area [referring to Caracas's west] . . . Then, all of us had to move, because they told us to vacate! . . . but as I had nothing . . . then we turned things around and left . . .

Rafael Caldera was the president of Venezuela from 1969 to 1974. During his first term, his government's approach to solving the housing problem was to eradicate *barrios* in order to build social housing. Although this may have seemed an adequate solution at the time, it disregarded established *barrios* as already-established areas. Furthermore, it ignored *barrio* residents and provided them with no support, leading to the perpetuation of disadvantage and vulnerability. This policy resulted in the creation of other *barrios*, as squatting in another area became the only option for those evicted. As M mentions, residents had nowhere to go; therefore, squatting in Petare was their only option. Thus the state became an indirect and unintended, yet critical, contributor to the squatting process and the establishment of *barrios*. The foundation and settling of La Dolorita in the early 1970s was also a consequence of the state's actions and political agendas:

> GU: we lived . . . in a place called Barrio Píritu [located in North Petare], . . . We left there . . . because of the construction of the Metropolitan University . . . well, they took out this path there . . . where the highway is, and then they built the Metropolitan University.

The *Universidad Metropolitana* (Metropolitan University) is a private institution where only the wealthy can afford to study. The campus opened in the neighbouring suburb of Terrazas del Ávila in 1976: in the late 1960s, part of Barrio Píritu was demolished to build a freeway interchange to grant access to this suburb and the university that was already under construction. With this project, the government enforced its power over the vulnerable to favour the privileged. GU's family, like many others, were forced to move from North Petare through their own means.

However, this story is not just of disadvantage and vulnerability, because opportunities arose from this eviction process. Subsequently, people settled on the steep terrain of Petare and La Dolorita and built their original shacks, which later influenced and defined the building form.

Community and solidarity: settling and consolidating the space

Throughout this process, neighbourly relationships led to the social processes of solidarity and rootedness. People chose where to settle based on these relationships:

> GU: [when] I arrived here . . . this was sort of an invasion . . . and then my dad . . . someone tipped him off that people were occupying lands, and my dad took a piece of land, and since that moment we began to develop a modest house [referring to a *rancho*] . . .

The decision of where to settle and raise one's family was driven by human relations. Similar to many other settlers, GU's father decided to move to La Dolorita because someone recommended the area. Hence, despite the apparent randomness of squatting, there were underlying social reasons for choosing where to settle. The formation of the *barrio* and its morphology were driven by these social processes of solidarity and collaboration:

> M: then my mum bought this house there . . . which is in front of my sister's . . . , and I bought a ranchito over theeeeeeeere! [indicating it was far away but still in Petare] . . . then I came crying at 2 am to my mum's . . . and suddenly my sister's mother in law . . . was selling this rancho here, and I said 'Oh, would you sell it to me?'

The importance of living close to friends and family is a reflection of the relation-based decisions made by *barrio* residents. This desire to be together led to the build-up and occupation of most of the vacant, developable, open spaces in an incremental fashion, presenting an appearance of chaos. This process also led to the 'intense plot coverage' and further densification.

People built *ranchos* using unstable materials. However, when people settled in the *barrios*, the fragile shacks evolved into houses:

> GU: . . . afterwards, we came to live here, and we began the construction of our house; . . . we lived there with several families.

> M: I bought this [*rancho*] . . . and then . . . I bought cement, I bought materials and built this tiny room. I began building it, but this house has been renovated twice.

Barrio residents are usually very proud of their houses because they themselves built them with considerable effort. Building the house is a family, and often community, effort that illustrates people's improved material conditions. However, the physical conditions do not matter as much as social processes and human relationships, because the place is constructed through interpersonal relations that are more powerful than formal or physical interventions.

Family and support: the path to the current built form

Once people set roots in the *barrio*, consolidating and densifying became mainly a generationally transmitted family matter:

> GU: . . . I was twelve, eleven years old, when this was starting to be founded . . . Then, I got married and had my family here. I have my wife, my kids, and even grandkids.

The development of the private space – from a rancho to a house – and the densification process take place over several generations. Brick by brick, the founders and their children upgraded their ranchos into houses. Building a house is a large part of the consolidation of the *barrio*; the built form takes a more solid and permanent shape. In this stage, the house expands and occupies the majority of the plot where the family squatted, aligning its front towards the street or pedestrian path. Once again, this growth process, driven by the

settling of the family in the *barrio*, led to plot coverage intensification and, thus, the maximum utilisation of the plot frontage. The main consequence of this practice is the differences in path widths.

This location towards the street highlights what was private space. From a physical perspective, the frontage is the most important element when defining the private space as it is the accessible part of the house, whereas the back usually faces the steep, inaccessible topography. Thus this placement delimits plots while defining the street's continuous urban edge adapted to the topography. This initial consolidation process led to a low-density/low-scale dwelling typology.

Barrio consolidation is a significant achievement on a social level that indicates the psychosocial security of residents, who finally feel settled. This feeling arises because the house is a tangible object that provides security and stability. Evolving from a rancho to a house portrays the rootedness and evolution of the physical space; this, in turn, is a reflection of the rootedness at the relational and psychosocial levels. The consolidation of the house reflects the social processes of 'placement' and belonging:

> M: and now my very own grandkids have had to come live here upstairs. Because we live here together, but not mixed, each of us is on their own, but in the same house.

The construction of a *barrio* house progresses with time. This phenomenon mainly occurs because families continue expanding, and people who stay in the *barrio* for economic or personal reasons usually want to stay close to their relatives. Here, family relationships and emotional closeness lead to physical closeness, promoting the densification process. Founders and following generations continued, with the development of the house, to host new and expanding family units. The houses continued growing upwards, and each family unit now lives on a different level within the multi-storey building, each with independent access. This social process led to the increase in height from one to up to five storeys.

This evolution and expansion of buildings both horizontally and vertically has had an enormous impact on the *barrio* space. The amount of open space has decreased over time due to the encroachment of private spaces, and a new semi-private typology has also emerged:

> JM: (there are) staircases everywhere and shortcuts that connect one part of the street with another that one doesn't know. . . . Some staircases have entrances that seem like branches, and there are connections all over. There are entrances that you cannot now say for sure if it is the entrance to a house or to ten, no? This is also because of the house's layout.

The private space and its occupation pattern in the steep terrain have led to a semi-private space typology. The pedestrian world originated the urban walls defined by the houses and is only comprehensible to *barrio* residents: this network reflects their way of life. The intricate system leads to clusters that are relational spaces principally visible only to those who are part of this tight family-neighbour nest. For outsiders, it is simply an unknown world (Figures 9 and 10).

The consolidation and densification of the *barrios*, the creation of semi-private spaces, and particularly the multiple entrances per structure allow semi-independent living for different family units and have made the organisation and legibility of the public space more complex. The densification process has dramatically changed the proportion of built space to open space, in comparison to the early and consolidation stages: this further has an impact on residents' perspectives on their *barrio*:

> L: it's houses on a main road, and it's houses attached to one another. . . . Here there is . . . a disproportion of houses and buildings.

Some residents perceive an excess supply of houses in relation to the *barrios*' limited open space. However, this phenomenon is a consequence of families supporting each other and expanding their own house to host different

Figure 9: Semi-public staircase in La Dolorita, Caracas (author's photograph).

family members. Thus this intricate built form is a reflection of the connectedness and closeness between families and neighbours.

The narrow streets and pedestrian paths are a consequence of these tight social relationships through which families built their initial house, and then when building the house next door or above, they also built the paths needed to connect these houses. In this consolidation and densification processes, residents concurrently built the private and the open space based on their housing needs and the need to connect with family and neighbours (both at a physical and social level). Hence having those physical connections is a reflection and consequence of those social networks. The closeness of the buildings, the narrowness of the streets and pedestrian paths, and the paucity of informal open public spaces arise and are built to cater for these community needs. Simultaneously, this *barrio* built form is a consequence of the tight community networks.

Conclusion

The *barrio* space has grown organically and its different stages were often driven by several social processes. The *barrio* dwellers, who were often the builders of the city (Bolívar, 1995), transferred that knowledge and built their houses and those of their neighbours. By building shacks and then houses, the *barrio* space was shaped; these buildings adopted a particular form new to Venezuela. Caracas' *barrios* emerged as a compact urban fabric that embraced the mountains surrounding

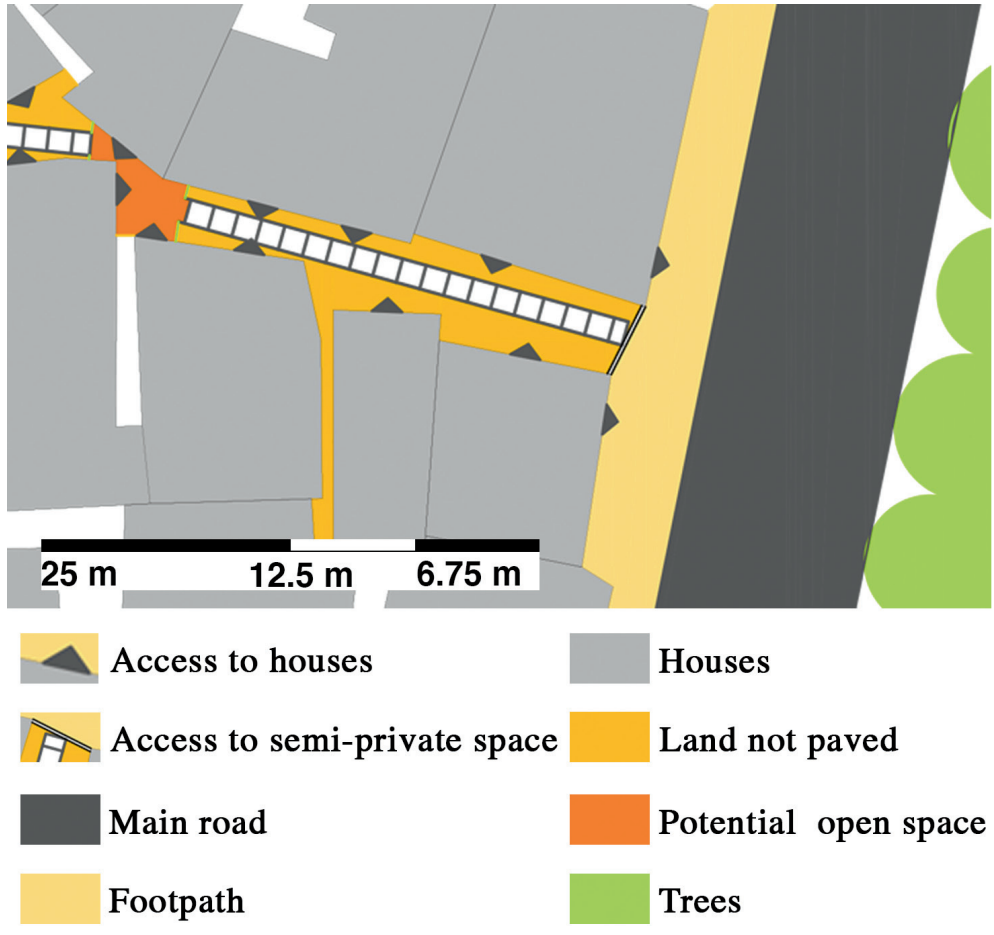

Figure 10: Illustration of semi-public space configuration. This is the same staircase as in Figure 9. This is an illustrative diagram: access to the houses shown here is not an actual representation of this particular space (source: author's observations, using a base map from the Institute of Urbanism, Universidad Central de Venezuela database).

the city, recognizable by all Caraqueños and any visitor to the city: the *barrio* typology (Marcano Requena, 1994).

Some aspects of the morphology and morphogenesis of the *barrio* are related entirely to the topography: the inconsistency of the rise and runs of the staircases as well as the organic pattern of roads and pedestrian paths lead to an undefined block structure. The combination of this particular topography and the social processes of squatting and consolidation lead to the fine-grained tissue accompanied with the width inconsistency of streets and pedestrian paths. However, some elements of the *barrio* form are solely determined by the social processes, such as the dimensions and configuration of the private space, with an average building having a 5 m frontage, 5–10 m depth, and 2–5 storeys in height that covers most (if not all) of its plot. People's need for social closeness led to building closeness and density of the houses that ultimately defines the current *barrio* form.

During the interviews, the participants related stories about their experiences surrounding the development of their homes. Although people focused on the private space as a familial and personal realm, the houses emerged as significant in the construction of the urban space. The more consolidated and

dense the private space, the more consolidated and communal the public realm. *Barrios* were initially shaped through the construction of the private space; however, *barrio* residents also expended much effort into developing that public realm. The processes of squatting, consolidating, and densifying the *barrio* began with an unbalanced power relationship with the government and evolved with family and neighbourly relationships of solidarity, belonging, and growth.

Future research on *barrio* morphology should address the social processes that drove the construction of public space. This would allow a deeper understanding of the residents' perspectives and experiences in building this globally growing urban typology.

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