BUILT ENVIRONMENT AND TRAVEL FOR SOCIAL INTERACTION: CASE STUDIES IN DIFFERENT URBAN CONTEXTS

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ABSTRACT

Expanding the study of the relationship between the built environment and travel, this research focuses on social interaction purposes, explicitly focusing on personal networks. The objective of this research consists on studying the relationship between the built environment and social travel, through the study of the spatial characteristics of personal networks, and the built environment and urban context where they are embedded (neighbourhood and city). The built environment is conceived both as the space where interactions occur (buildings and streets) and the space of movement (travel routes). The urban context is defined as the characteristics of the neighbourhood and the city involved on these interactions.

Personal network data from four different neighbourhoods from Concepción, Chile, were collected capturing different combinations of income (low and high) and access to CBD amenities (close and far). The gathered information includes the social contact's spatiality (home location and usual place of interaction), interaction patterns, and socio-demographic characteristics. The built environment is characterized at different social and spatial scales: individuals, personal networks, neighbourhoods, and the city. The methodology links traditional quantitative indicator approaches with an explicit qualitative analysis. Case studies provide insights about the individuals' experience of social interaction and their built environment context, both in terms of the potential travel routes of encounter as well as the specific spaces of interaction.

The results suggest that some aspects of the built environment are not captured by the traditional frame of travel research, giving some insights about the need to incorporate different spatial levels and scales of analysis to understand travel for social interaction. These aspects are partly remarked in the case studies, which illustrate the higher "localism"

in low income social networks – involving a stronger role of the built environment – contrasting with higher income groups.

The methods and results from this paper expand previous findings about the research about the social dimension of travel, and the role of transport in social networks. From a policy perspective, they highlight the difference that the built environment can make of travel, in relationship with social interaction, they provide potential insights for key aspects such as social exclusion and segregation in urban cities, from the perspective of the urban experience of different groups.

Keywords: built environment, social interaction, travel behaviour

INTRODUCTION

Expanding the study of the relationship between the built environment and travel, this research focuses on social interaction purposes, explicitly focusing on personal networks. The objective of the research consists on studying the relationship between the built environment and social travel, through the study of the spatial characteristics of personal networks, and the built environment and urban context where they are embedded (neighbourhood and city).

The built environment is conceived both as the space where interactions occur (buildings and streets) and the space of movement (travel routes). The urban context is defined as the characteristics of the neighbourhood and the city involved on these interactions.

An effort to link different visions about the relationship between built environment and travel, which had being tackled both from urbanism and transport research, individual social behaviour at a social network context.

The urban context characteristics considered at the transport research literature depends on the variables that are related to the dimension or scale, and the approach of the specific analysis frame of each researcher (Boarnet & Crane, 2001; Cervero, 2003; Crane & Crepeau, 1998; Crane, 2000; R Ewing & Cervero, 2010; Reid Ewing, Handy, Brownson, Clemente, & Winston, 2006; Handy, Cao, & Mokhtarian, 2005; Kitamura & Mokhtarian, 1997).

The social needs of individuals, which generate social interactions, are based on performing and maintaining relationships with their contacts, sharing experiences, having joint activity participation, sharing information with other people, and learning individually about their local environment (Ronald & Arentze, 2009).

Activity spaces are configured by the mental maps of the traveller. These mental maps together with the activity repertoire and the expectation space are three aspects that are used to describe a traveller's world in the literature (Schonfelder & Axhausen, 2003). This approach was used to define the built environment where the social interactions occur and the space of movement (travel routes) by different individual groups.

Travel and interactions places configure the built environment where individuals interact in the urban context through conjoint activities. The individuals' experience gives to the urban context a meaning emerged from the actor's social context, considering their social, economic and a cultural background, in such a way that a sense of place are generated to the actors involved (Vidal & Pol, 2005).

The social interactions are relevant to maintaining social capital. In this case, social capital can be defined as the "resources embedded in a social structure which are accessed and/or mobilized in purposive actions" (Lin, 1999). Within social networks, the actor and their actions are interdependent, and their links provide tangible and intangible resources transference. This exchange generate a powerful tools to construct social capital, where individual and collective engagement strategies become trust, cooperation, and reciprocity (Lin, 2005; Atria *et al*, 2003).

The above ideas suggest the importance of understanding both "with whom" the activity was performed with and "where" it is carried out. This is reinforced by the studies conducted by Carrasco and Miller (2006), who explicitly incorporate social networks into the activity-travel behavior framework, providing insights to understand social activities and key aspects of the underlying behavioral process.

Information Communication Technologies (ICS) allow social networks to extend in space, since there are no geographic barriers of distance between actors to reach theirs links. In this sense, the idea of community is not necessary related to a specific territory, and could be related to a virtual space provided by ICT (Wellman, 2001).

In spite of the empiric evidence about social networks having broader geographical coverage due to ICT (Wellman, 2001), research carried out in Brazil suggests that localism is one of the most common characteristics of the social networks in a poverty context. Localism represents the presence of social ties in a specific area, restricted to spheres of sociability with endogamy tendency, such as neighbourhood and family. This aspect are related to urban segregation or isolated spatial of social groups around the city *(*Marques*, et al*, 2008).

The urban context can facilitate or constrain the characteristics of social interactions between actors of one or different social networks, where there are face to face activities. For low income groups, the built environment can provide a space that motivate interchanges, extending and reinforcing their contact networks and their social capital.

Grannis (1998, 2005), postulate that the built environment mediates and constrains social interaction through passive contacts, which there are opportunity for acknowledgment of another's presence and discovering other people through observation and conversation. In this sense the local streets, offers the possibility that this contacts occurs, once that the probability increase in a limited walking area.

In part, some density and continuity of the local network streets in a limited area are bounded by major streets, contributed to constitute communities within individuals with same

characteristics. According to Grannis, the built environment provides a friction space by daily contact which increases the probability of social interaction between individuals with similar social characteristics.

In a similar vein, *Space Syntax* theory, the seminal work by Hillier and Hanson (Hillier & Hanson, 1984; Hillier, 1996), proposes a symbiotic relationship between the spatial configuration and human activities. The theory assumes that space is shaped by a set of sub-continuous spaces organized with links between them. These spaces establish a specific pattern of connections that contains geometry and a topology of organization and connections between continuous sub-spaces, which define a pattern of connections.

In this way, *Space Syntax* configures space as a sequence of continuous space into a set of interconnected discrete units (Bafna, 2003), which also possesses social, economic, and environmental factors that can be objectively measured.

This configured space properties can be measured by graphs schemes, based on the space topologic geometry, which represents their relations and connections. These properties become numeric descriptions about the different relations between the spaces contained in the urban context. Spatial relations are implicit by the built environment, and are conceived as a social construct that defines a pattern of movements.

The street network provides the space to develop the pattern of movements, which can be measured. Marshall (2005) names routes to Hillier axial lines to represent the space justified graph. This analogy describes a movement pattern which relates social interactions and activities that occur in space, movement performed in a specific transport mode.

Another studies attribute these pattern of movements to activity localizations, such as public services, shopping centres, schools, churches, parks and green areas, and social centers, which are located at a determined distance from residential places, and which can facilitate social activities between people of the same and different households (Fan & Khattak, 2009).

Social interactions occur in a built environment, embedded in an urban context, which has been analyzed by the transport research literature from different perspectives. Traditionally, density, diversity and design are variables common considered to relate the urban context to transport behavior (Boarnet y Crane, 2001; Crane y Crepeau, 1998; Crane, 2000; Ewing y Cervero, 2001). From a macro scale viewpoint, the distance between residential location and the CBD is also a variable traditionally considered by some researchers (Næss, 2004, 2005). Therefore, residential location is an attribute to establish some parameters to define some accessibility indicators (Kitamura et al, 2001).

Three Dimensions of Analysis: Spatial, Social, and Time

In a literature review was possible to indentify three dimensions of analysis about the relationship between built environment and travel. Table I shows the relationship between the spatial, social, and time dimensions, with different approaches discussed in the literature, based on travel, activities and attitudes.

The three dimensions (spatial, social and time) give the framework to measure each dimension, and the approaches (travel, activities and attitudes) can highlight different perspectives between the urban context and travel behaviour. As the approach evolves, more attributes are added in the three dimensions. The spatial dimension perspective reveals the urban context, which is defined by different attributes, and has a central role to understand the travel behaviour.

Table I – Social and Urban Context attributes dimensions

DIMENSION	SOCIAL AND URBAN CONTEXT ATRIBUTES	APPROACH		
		TRAVEL	ACTIVITIES	ATTITUDES
SPACIAL	Density	x	x	
	Diversity	x		
	Design	x		
	Esthetic			x
	Commuting distance			x
	Service Centre distance		x	x
	Transport Facilities		x	x
	Interactions places		x	
	Primary Schools			x
SOCIAL	Neighbours interactions possibilities			x
	Security			x
	Residential Prices			x
	Income level		x	x
	Household size		x	x
	Education level		x	x
	Occupation		x	x
	Gender		x	x
	Age		x	x
	Car owner		x	x
	Job place		x	x
	N° Families at the same House		x	x
	Life Cycle		x	x
TIME	Time free		x	x
	Neighbour interactions frequency		x	
	Time of Activities operation		x	

CONCEPTUAL FRAMEWORK

This research analyses the relationship between the built environment and travel, focusing in the social interactions travel. As Axhausen states, the social interactions are defined "by different aspects that involucres the social network actor's abilities to relationship between them that are mediated through technologies interactions, like emails, chats, phone, etc. There must be considered the actor's joint responsibilities, commitments, references, knowledge's and history that who are participated in social activities" (Axhausen, 2006).

Sometimes, the built environment is conceived both as the space where interactions occur (buildings and streets), similar to Grannis, (2009) when he studies racial communities in some American cities. In other cases, the built environment can be a catalyst of activities and social interaction, such as, for example, parks or commercial centres near the home location, which improve the social joint activities in the family context (Fan & Khattak, 2009).

The social network analysis approach was used to identify the social context where the social interactions and activities were embedded, and the built environment where these interactions and activities occur.

In this sense, to understand the role of the built environment – defined as the "place" where the social interactions occur – it is necessary to characterize the different places where these interactions occur. For example, whether these environments are closed, open, public or private, and whether their characteristics help interactions to occur, related with the characteristics of the individuals (connected with his personal network) and the urban context where the individual homes are localized.

Furthermore, since travel from a place to another is necessary to participate in a social interaction or activity, the built environment is also defined by the space of movement, which are the travel routes to the social activity, such as the place where the social interaction occur, defined by the arrangements previously made between the individuals involved in that activity.

The travel routes are defined by the streets networks embedded in the urban context where the individual home are located, which can be formed by the dynamics from the individuals movements, defined by the social interactions and activities between the individuals that conform their social network (travel routes network).

The network inside the network

The above perspective establishes a superposition between the personal social network structure and the street network (Marshall, 2005), which is defined by the travel routes network conformed by the social interactions of the individuals.

With this perspective in mind, a framework was developed, synthesizing the different social-spatial dimensions needed to integrate the different aspects of this multidisciplinary and multiscale problem. Table II synthesizes these dimensions.

Table II – Matrix Dimension / Analysis Levels

DIMENSION	LEVEL OF ANALYSIS	
	Neighbourhood	**Individual**
SPACIAL	**1. Architectural and physics characteristics** Urban morphology Urban Quality Residence Density Occupation level of the ground Land Use Equipments level Roads Network Structure Transport coverage	**1. Interactions Places** Types Localization **2. Travel routes** Modes Routes structure
SOCIAL	**1. Social-economic characteristics** Average Level income Life Cycle Gender Education Level Occupation **2. Social Network Characteristics**	**1. Social Network structure** Homophily Size Degree Betweenness Closeness Density Isolated Components Cliques

At the neighbourhood level, the framework incorporates aspects of the built environment indentified both in the traditional transport literature (Ewing y Cervero, 2001; Jones, 2009) and urban morphology (Panerai, 2006; Solá-Morales, 1996). In addition, another attributes, such residence density, design, diversity, occupation level from the ground, equipments level, and transport coverage, could establish several quantitative indicators to compare the different neighbourhoods studied.

At the individual level the interactions and activities places ("where") are analysed, studying place and location, identifying nearby facilities. In addition, travel routes were generated to study the movement from one place (the home) to the social interaction or activity place, considering the travel mode. All these elements, such places and routes are considered, the individual "social activity space"

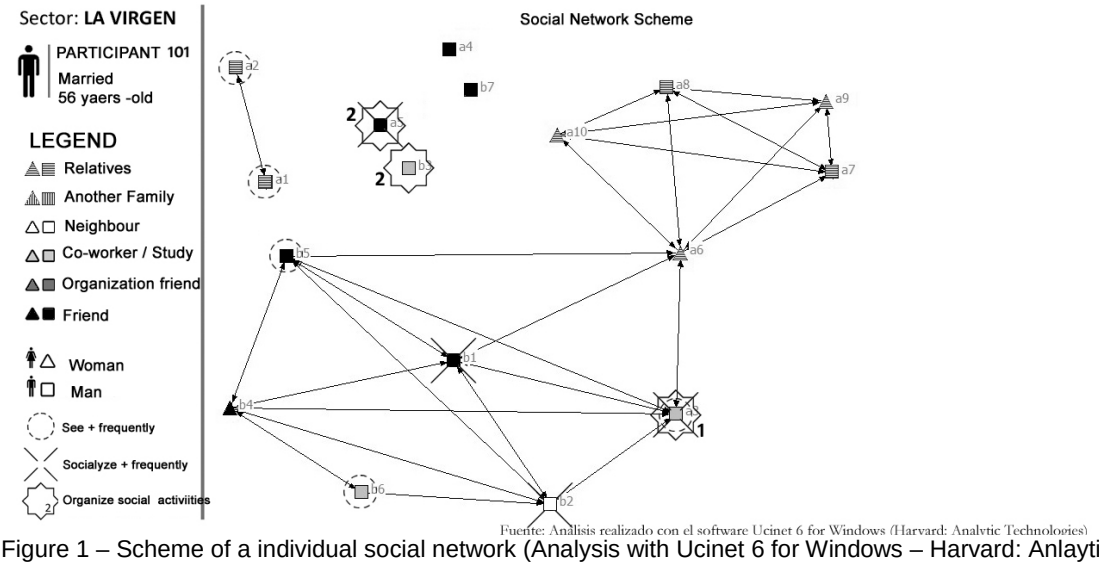

Figure 1 – Scheme of a individual social network (Analysis with Ucinet 6 for Windows – Harvard: Anlaytic Technologies)

In the context of the social dimension, the neighbourhood is defined by socio-demographic aspects, which in turn affect the characteristics of the social networks. For example, attributes like lifecycle, educational level, occupation, gender and income level, have a potential relevance to the characterization of the sample, which can give insights to the localization of the social activities. On other hand, the personal social network structure of the individual (Figure 1), establishes relevant aspects that affect the social interaction, such as homophily and social level (Grande, 2007; Marques et al., 2008).

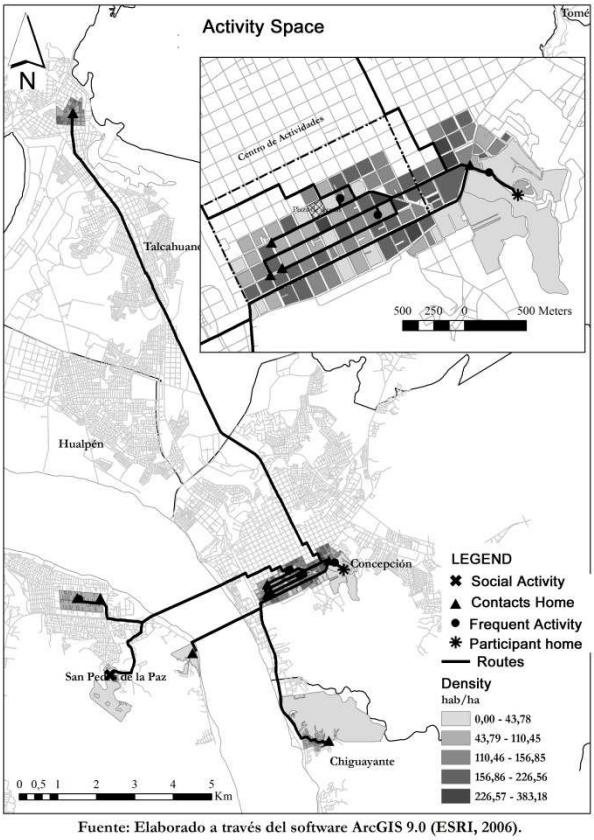

Figure 2 – "Space Activity" (Analysis with ArcGIS 9.0 – ESRI, 2006)

This conceptual framework converges to the different dimensions and levels of analysis tackled by different disciplines approaches (Table II). In this way the urban context and travel behaviour are integrated such that the social network analysis approach emerges from the relationships and links between individuals.

METHODOLOGY

DATA

The data employed in this paper come from samples of individual groups from four neighbourhoods of Concepción, Chile. The city is located 500 km south from Chile's capital, Santiago, is the second metropolitan area largest in the country which has a population of around one million people. The city area is around 300 km2 and is served by a relatively good quality radial-based public transport system (buses and shared taxis), with good public coverage and level of service, representing a 60% of modal share. The other two key transport modes are walking (20% of modal share) and car (15% of modal share); the latter having good level of services as well. Concepción presents diverse income levels, with an auto ownership of around 35% of the households. The city has a diversity of economic activities, especially manufacturing and services, constituting the second most important economy in the country.

In this urban context, data about personal networks were collected in four distinctive neighbourhoods in the city that was controlled by socio-demographic aspects by one hand and by another one by the distance from the main centre of business district (here thereafter, CBD) of the city. The low income neighbourhoods (here thereafter, LI), Agüita de la Perdiz and Santa Sabina, are composed mainly by medium through low income households while, La Virgen / Barrio Universitario and Lomas San Sebastian / Lomas San Andrés, are high neighbourhood (here thereafter, HI), which are composed by medium through high income households (here thereafter, HI). Both LI and HI do not have extreme poor or wealthy households, which are rare in the city in general. By these criteria, there is a matrix with pair of neighbourhoods which pair high/low income columns and which high/low accessibility CBD rows (Table III).

Spatially, both pair neighbourhoods which LI and HI situate besides each other, that is, the pair high accessibility CBD have a around twenty minutes walking distance (around 1,5Km) to downtown Concepción, where most of the services and workplaces locate. The low accessibility CBD neighbourhood pair locate around 6km distance from downtown Concepción, which can be around 30 min by a motorizes modal transport.

The data were collected by four different tools: semi guided interviews, sociogram, name generators and name interpreters, wise detailed in Carrasco et al. (2008). The interviews captured the main socio-demographics characteristics and mobility behavior of the participants. The last three techniques captured information from de contacts of the social networks of the participants.

Table III – Selection Data Sample

		Income Level	
		High	**Low**
Accesilbility CBD	**High**	La Virgen Barrio Universitario	Agüita La Perdiz
	Low	Lomas San Sebastián Lomas San Andrés	Santa Sabina

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ANALYSIS DIMENSIONS

The analysis considers two dimensions: social and spatial, and in turn in two levels: neighborhood and individual (Table II).

A comparative analysis was made at the spatial dimension through aspects of urban morphology, as streets patterns, division of the land and buildings, transport coverage and activities deals in the neighborhood level (Figure 3). Additionally, there was applied a street network analysis method based on *Space Syntax*, defined by Marshall, (2005). This method allows the analysis to capture the properties of the structure of the travel routes, through a network topology and junctions intersections. The measures of these properties give the local integration or global integration to the whole city.

At the individual level, the space activities were studied in particular cases in each neighborhood. The activity spaces considered three levels of contacts (geographically localized points): i) participants households and household contacts ii) participant households and place of frequent interaction, and iii) participant households and place of social activity.

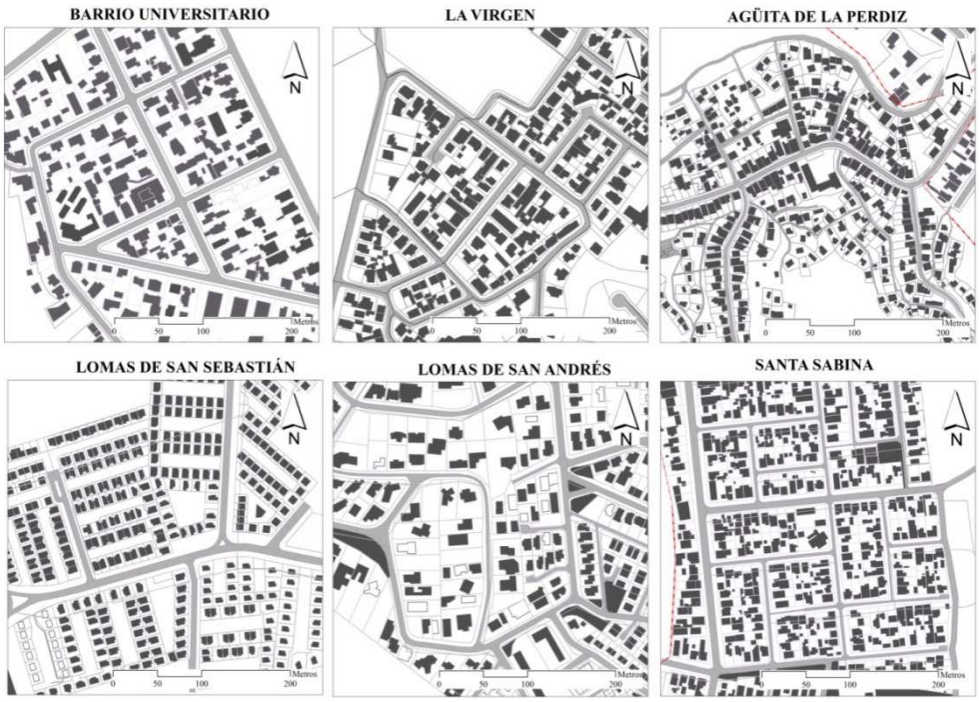

Figure 3 – "Urban morphology comparative of the neighbourhoods"

Each level of contacts established paths from one point to another assuming the shortest distance through the existing road network by the transport mode. This method allows the analysis to make a network of routes that represents the relationship between individuals and the built environment (Figure 2).

The social dimension at the neighborhood level focuses on two aspects: socio-economic characteristics of the sample groups (such as average income level, education level, gender and occupation), as well as aspects such as composition and other social network characteristics. At a individual level, the analysis focuses on personal network structure indicators, based on social network analysis (McCarty, 2002), such density, degree, closeness, betweeness, components and cliques.

The analysis at individual level, consider both the social and spatial dimensions in a parallel way, such as the superposition of the structure of the social networks to the structure of the activity space, represented by the place "where" and "with whom" the social interactions occur and the travel routes described in the three different levels showed before.

RESULTS

The comparative analysis relates the morphologic aspects of each neighbourhood, which represent different phases of urban growth.

The comparative analysis incorporate the urban morphology in each settlement and the urban context of the place of residence of the respondents, which is the result of the city's urban growth at different stages, and holds out as a model of development that is reflected in the constitution of its urban fabric.

The socio-economic segmentation of the city could be recognized by the identification of the forms of urban growth (Solá-Morales, 1996), which is implicit in the choice of the sectors under study.

The study shows evidence that high income neighbourhoods have morphological conditions related to the dependence on private car for their activities. However, low income neighbourhoods, who are more dependent on public transportation, not necessarily have morphological conditions to facilitate access to public transport, which generates a double restriction in terms of accessibility to social activities.

The analysis of the network routes structure (Marshall, 2005), reinforces the morphological analysis above, where the neighbourhoods studied were developed by the extension of the urban growth of the central area of the city, with suburban characteristics (Table IV).

The values of relative continuity (l), relative connectivity (c) and relative deph (d) help us to compare the network system of each settlement. In the case of the network connectivity, the value of relative connectivity refers to the local integration with the links which are made each route, while the relative deph refers to the relative position of one route in function of urban context which the network are embedded.

The results show a high level of internal local integration in Barrio Universitario, Agüita la Perdiz y Santa Sabina neighbourhoods. This values indicates good conditions to walking as a travel mode, which is consistent with results that indicates walking such preferred mode to visit friends and family in Agüita de la Perdiz and Santa Sabina neighbourhoods, representing 35% and 32% respectively of the travel mode election, which is the second option after public transport to low income neighbour groups (Figure 4).

A good level of local integration favours the contact between participants of social network (Grannis, 2005), with contacts households locating very near each other, situation that could be observed frequently in Agüita de la Perdiz y Santa Sabina, low income neighbourhoods.

In the same neighbourhoods, social network analysis show a presence of “localism”, that is, the tendency that network contacts live in the same neighbourhood of the participants (Marques et al, 2008). This localism is also present in the social interactions places specially in Agüita de la Perdiz (66.3%) y Santa Sabina (51.2%) neighbourhoods. However, the proportion of contacts that live in the same neighbourhood of the participant is reduced to 17.1% for La Virgen and 22.3% for the Lomas de San Sebastian neighbourhood

Table IV - Network properties using Marshall's framework

NEIGHBORHOOD	NETWORK PROPERTIES							
	L	C	D	types	summarize (S)	l	c	d
Agüita la Perdiz	73	129	127	19	329	0,39	0,22	0,39
B. Universitario	41	64	51	16	156	0,41	0,26	0,33
La Virgen	50	71	94	18	215	0,33	0,23	0,44
Santa Sabina	214	256	200	33	670	0,38	0,32	0,3
Lomas S. Sebastián	24	25	31	9	80	0,31	0,3	0,39
Lomas S. Andrés	183	215	246	31	645	0,33	0,28	0,38

Where,
L = Σ l = continuity; C = Σ c = connectivity; D = Σ d = depth
l =relative continuity; c =relative connectivity; d = relative depth

From the comparative analysis of the network routes properties, La Virgen, Lomas de San Andres and Lomas de San Sebastian (high income) neighbourhoods have many connector routes, with continuity values similar to a suburban settlement. In transport literature, research relate these urban characteristics to private car use such preferential transport mode (Ewing & Cervero, 2001). However, Lomas de San Andres y Lomas de San Sebastian, have the highest percentage of tributary routes (45% and 42% respectively) relative to La Virgen (31%).

The results suggest that the private car is the travel mode to visit friends and family in the high income groups, while public transport mode was chosen for the low income groups. As an exception walking in La Virgen / Barrio Universitario neighborhood was only somewhat lower (28%) compared with the low.-income groups both Agüita de la Perdiz (35%) and Santa Sabina (32%).

These later results can be an evidence of the role of the distance to the CBD. In fact, La Virgen and Barrio Universitario neighborhood is not so far from the amenities of the commercial and service centre, which in addition are the principal job places for the sample groups.

In terms of density, diversity and activities, the study cases have majority residential use (Figure 5). However, some other activities can be observed in the urban context of the neighborhoods. This difference can be result of the characteristics of the activities performed in the low income neighborhoods; where there is local commerce generally distributed along the major routes.

In addition, it is possible find in Santa Sabina several religious equipments. In fact, there are different kinds of religious associations in addition the traditional church that also exists in the others sectors. These places are related to the social interactions and to the social networks of the sample group of this neighbourhood, involving some individuals with have social commitments and participants of these organizations that integrate their social networks.

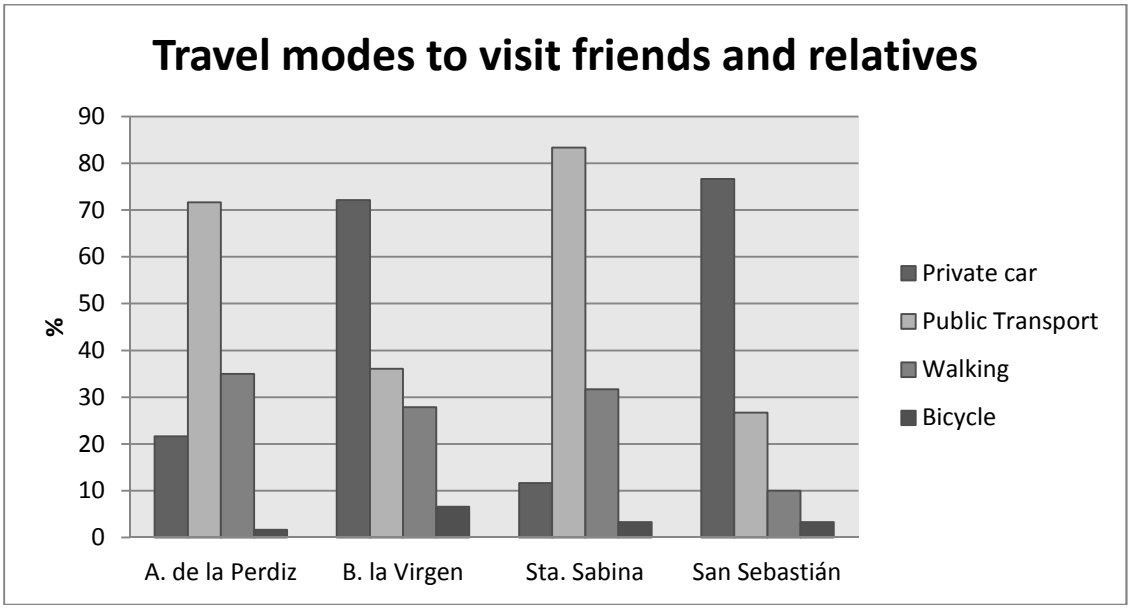

Figure 4 – Travel modes to visit friends and relatives

Independent of the case of study, the households are the place where the social interactions occur more frequently (Figure 6), between 73% (Agüita de la Perdiz) and 79,6% (Lomas de San Sebastian / Lomas de San Andres). This indicator shows the importance of the location of these sites and their geographical distribution, becoming an important part of the activity space of individuals in the context of their personal networks.

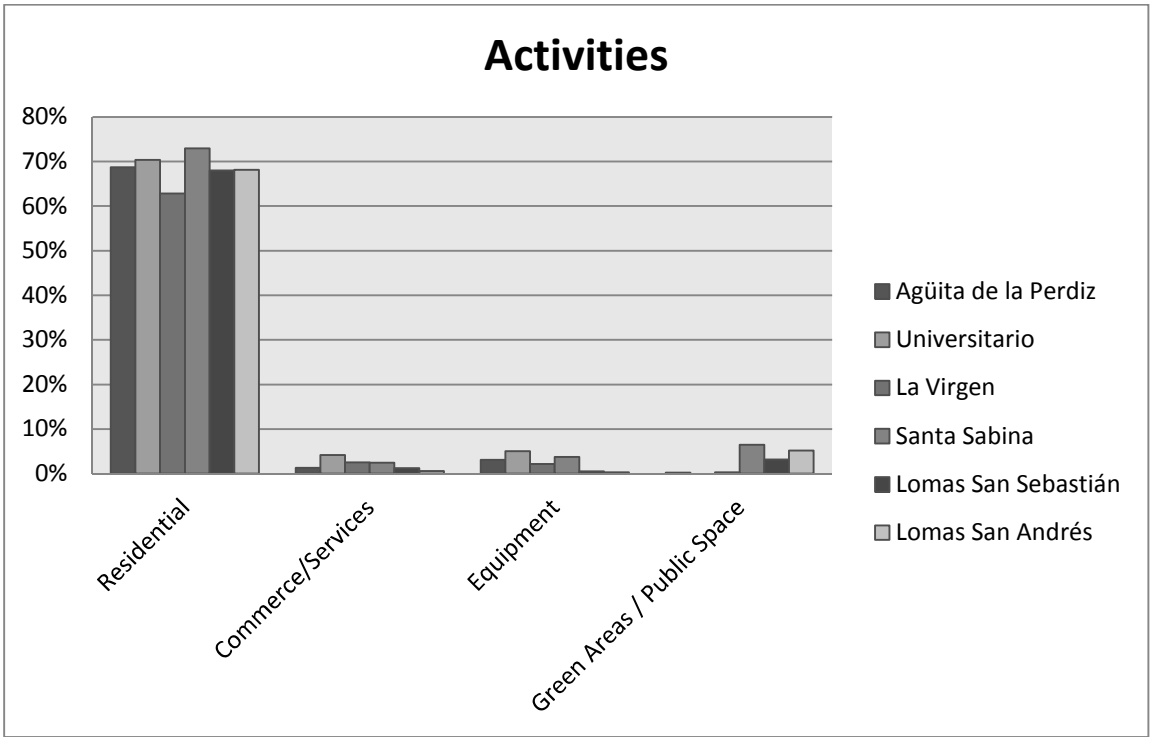

Figure 5 – Mixture of uses.

This research reveals no evidence linking the presence of green areas, squares and parks, with social interaction between participants of social network. The squares and parks in the study cases, in general, do not have an intensive use. This aspect was also observed in field

study visits. However, the places with playground equipment had more recurrent children presence, as seen in Lomas de San Sebastian and La Virgen. In the other neighbourhoods, the use of the public space was related to activities uses around them, rather than the social interactions of individuals with their social contacts.

Despite this fact, the street is a public space mentioned several times during the interviews (Figure 6). In relative terms, this kind of place does not have a comparative relevance with the households which site of social interaction. However, this gives some insights that reveal the individuals behaviour with their social network.

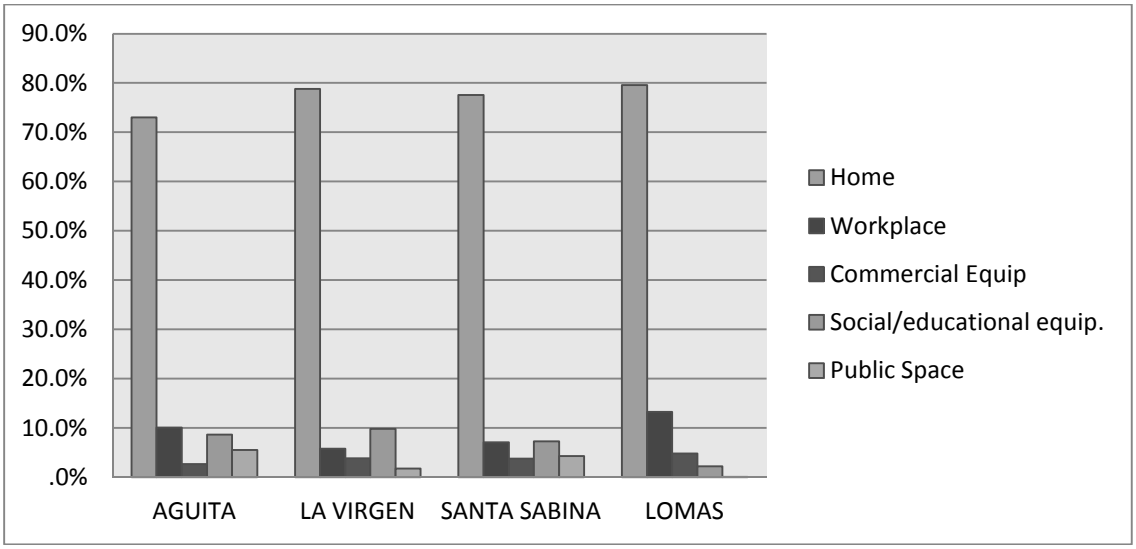

Figure 6: Place of more frequent social interaction

In the case of low-income groups, it is possible to infer that the frequent interaction that occurs in the street is produced on the one hand by socio-economic constrains, and because urban context attributes allows this interaction to occur, due to the position of the housing relative to the street or the strategic location of some local commerce at the neighbourhood. This result illustrates the importance of local streets (Grannis, 2005) for the formation of local communities with similar characteristics socioeconomic.

In Barrio Universitario / La Virgen those that mentions the street as a frequent place of interaction are generally outside the neighbourhood context, with encounters generated by the chance of encountering someone in the urban context, but more related to commerce centres in the matching procedures associated to the work.

Interestingly, in the case of Lomas de San Sebastian / Lomas de San Andrés neighbourhood, there was no mention of the public space, street, or other open spaces. However, there is a higher incidence of frequent interactions in the workplace, as it seems natural to be associated with their social network contacts whose role is co-workers.

Interaction was observed, in addition, in commercial, social and educational equipments. The commercial equipments refer to restaurants, coffee shops, pubs and discotheques, while social and educational equipments refers to communitarian centres, religious organizations,

churches, schools and colleges, where the participants and their contacts maintain close bond or going to study.

In a comparative analysis, social and educational equipment appears in Aguita de la Perdiz, La Virgen y Santa Sabina, more than in Lomas de San Sebastian y Lomas de San Andres. In the case of Aguita de la Perdiz and Santa Sabina neighbourhoods, there were more individuals involved in communitarian associations or religious groups; while in La Virgen there was a relevant number of student participants.

On the other hand, in the case of Lomas San Sebastian / Lomas San Andres, the social interactions outside the home, are carried out mostly at commercial equipments with co-workers. These results are coincident with the fact that the sample group has more active individuals.

This behaviour can be related to the socio-economic condition of the sample group, since at the activities at commercial equipments implicitly imply some kind of consumption, which does not occur at social and educational equipments. It is interesting to observe that low income neighbourhoods have more social equipments than commercial equipments, where the frequent interactions also occur.

The study reveals the relationship between the sites “where” and “with whom” the frequent interactions occur have a similar pattern in the different neighbourhood. The site elected to social interactions with friends is more diverse. The site of frequent interaction with co-workers or classmates generally occurs in the participants work or the study place, with a minor incidence at home with theirs contacts. The interactions that occur in the public space (street) usually occur with neighbours and to a less extend with friends in low income cases.

The role of the contacts of high income groups are composed by friends more than relatives. These aspects contrast with low income groups, which give more presence to relatives, immediate family and friends compared to other roles.

CONCLUSIONS

The methodology developed integrates different dimensions and approaches about the relationship between the urban context and travel. The method employed gives insights about aspects that are not traditionally considered in the transport research.

The localism indentified in the social networks of the individuals with low income has some relevance that is reinforced by the distance from the CBD in the Santa Sabina case.

The localization of the job or study place was relevant aspect, together with home location, which has a central value in the definition of the activity spaces. The density and activity diversity in the built environment near the job, facilitate the social interaction with members of the social network outside the work environment and places different from the home (Ronald & Arentze, 2009).

The localism indicator also remarks the importance of the neighborhood as a place where most social interactions of low income individuals occur, where local contacts are also very relevant. Equipments that facilitate contacts within the neighborhood, such as cultural, social or religious association centers, do not necessary implicate some economic constrain, and were mentioned frequently in social interactions outside of the home both in Aguita de la Perdiz and Santa Sabina.

The distance from the CBD facilitated the social interactions. A possible hypothesis is that it can help people to access social activity by walking, and the budget for the transport can be invested to share with friends at a commercial place, for example. This situation is a constraint to the individuals from Santa Sabina, since this neighborhood is farther from the CBD, despite having good transport coverage.

The research also revealed that the home is the most relevant place of social interaction mentioned in the interviews, indistinctly of the income and the neighborhood localization. Despite of this, homes is reserved preferentially to parents or friends, and to a less extend to work or study colleagues and social organization partners.

There is some relation between social closeness and proximity distance in the low income group. This aspect can be explained by the presence of neighbors in the social network of this group, and the tendency to stay in the neighborhood where their parents live. On the other hand, social close personal network members from high income groups are not necessarily at a physical proximity, since this group has more resources to maintain active contacts by other modes beyond face to face interaction.

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