



Observing gendered interdependent mobility barriers using an ethnographic and time use approach

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ABSTRACT

Combining traditional transport research tools with qualitative research methods, particularly ethnography, can contribute to our understanding of the complexity of mobility strategies, particularly their gendered differences. Ethnographic approaches can both explain and disentangle some of the results that emerge from travel and time use surveys, hence providing a more complete picture of how and why these strategies take place, and the barriers people face when moving in the city. Using research-case studies based on in the city of Concepcion, Chile, the paper describes the application of these methods, presenting results which are particularly gender sensitive, as they shed light on the difficulty of understanding mobility strategies as individually decided and conceived, and help to explain how mobility strategies are interdependent and how determinant issues of care are in terms of mobility decision making.

1. Introduction

As equitable access to urban opportunities becomes increasingly relevant in transport policy, the traditional choice paradigm to characterize people's daily activities requires a broader outlook to question certain assumptions. It also requires complementing transport models with other data gathering techniques and analytical lenses that can broaden our understanding of their complexity. In fact, accessibility barriers can help to understand people's differentiated daily mobility experiences (Jiron, 2010, 2011), and how these can heavily influence spatial and temporal patterns on people's activities. It has become apparent that the traditional survey and quantitative methods can only partially disentangle these experiences.

In this regard, mobility strategies need to be understood not only mediated by space, time, and money, but also by other intersectional categories for identities including gender, age, ethnicity, life course, among others. Including these aspects translate into opening up understudied issues such as mobility of care patterns (Sánchez de Madariaga, 2016), embodied spatial inequalities (Massey, 1994), the consequences of dichotomic thinking in space, particularly in relation to public and private spaces (McDowell, 1999), the importance of women's experience in better urban solutions (Magro and Muxi, 2012), time use and care arrangements in cities (Duran, 2012) as well as other complex daily arrangements (Jarvis, 2005; Hayden (2005) that go beyond the simplified daily travel perspective, mostly driven by the focus on commuters (generally men) to work. Consequently, a mobility approach that understands the multidimensional, multi-relational and interdependent ways in which people move, unveils possibilities to further understand policy questions regarding the role transport plays in inequitable cities.

This paper presents a research carried out in the city of Concepcion, Chile, where time use information was combined with

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ethnographic studies on participants' gendered mobility strategies, which are seldom considered in traditional transport studies. Through various cases, the study illustrates the interplay among several travel behavior dimensions, including time, space, expenditures, transport modes, travel know-how, technology, embodiment, emotions, daily organization, and social networks. In particular, the cases highlight how aspects such as interdependence and care issues around mobility can be better understood if the analysis goes beyond individual perspectives, combining quantitative information with detailed accounts that emerge from accompanying people's daily travel experiences. The case studies illustrate dimensions that are often invisible when using traditional methods in travel behavior research, thus enhancing our understanding of people's daily mobility strategies, and particularly their gendered particularities. Specifically, this study aims to introduce interdependence and care as crucial aspects of gendered mobility, through ethnographic approaches that shed light on the complexity of mobility, particularly when using gender lenses to observe everyday life.

2. Theoretical framework

2.1. Gendered and interdependent mobilities

One of the most significant elements that a mobility approach can provide urban and transport studies is the way it questions who, how, why, and with whom people, objects, and ideas move, insisting on the fact that there is not *one mobility* but a *multiplicity of mobilities* taking place. These simple questions can help to unveil daily aspects of mobility that could be crucial for improving policy making. One of which involves differentiated time-space experiences, which often generate situations of inequality or exclusion.

As a socio-spatial phenomenon, gendered space involves the way gender takes shape in space and the way space influences gender has specific consequences in people's everyday lives, including their mobility and their sense of identity (Muller, 2019). Gendered spatial differences have been made particularly visible in the work of feminist geographers including Massey (1994), McDowell (1999), Hayden (2005), Hanson and Pratt (1995), Kwan (2005), Valentine (1989), Law, (1999), Grieco and McQuaid (2012). However, despite gender being present in urban and mobility studies, these have not managed to penetrate mainstream transport discussion as they are still seen as women's issues.

How mobility and gender intersect is undoubtedly complex, due to existing disputes as to the comprehensions, meanings, and power involved in both. Based on a literature revision on gender and mobility studies over the past few decades, Hanson (2010) identifies two major trends that are still relevant today. As to the first, she explains that this trend has taken a simplified vision of gender, placing attention on measuring mobility in detail, mainly using quantitative techniques. These studies are based on two types of data: Large secondary national databases, most of which the only register trips to and from work made by travelers, and daily activity of trips which register movement outside of the home for other purposes, usually based on one or two days, from a sample of persons living in metropolitan areas. In general, these studies identify that there is a spatial range of daily movement of women which is more reduced than that of men (Hanson, 2010; Uteng, 2011). Women are also more likely to use public transport than men, make more trips not related to work, make more stops during their trips, do more errands from home, travel accompanied by more people, and tend more to carry passengers. This literature has also documented differences between men and women; for instance, according to age, income and place of residence, among others.

Additionally, women spend more time in reproductive roles than men (Uteng, 2011). They also have a more restrictive time space accessibility in comparison to men, as well as more complex schedules and activity chains. Hence, women usually tend to adjust their schedules to accommodate work and their diverse roles. For instance, parenting and care obligations force women to seek work closer to home than men. Similarly, there are differences among women (urban vs rural, lower vs middle class, educated vs uneducated). In various low-income countries there is a high dependency and low availability of public transport systems, which generate informal transport systems in many cases (Uteng, 2011). Another example in this line is the work of Miralles-Guasch et al (2016), who use mobility data from a large travel survey taken in Spain in 2006 to examine the gender mobility differences through age. Gender is found to be a fundamental variable in understanding modal split and trip purposes, and by extension, transport sustainability, in terms of energy consumption and the emission of greenhouse gases.

As to the second trend in the literature, Hanson (2010) maintains that research has concentrated on gender dimensions relative to power, agency, identity, and subjectivity linked to mobility. For decades, there is has been research on public and private spaces, or the relation between confinement and freedom (McDowell, 1999). However, details regarding movement patterns or reasons for moving have received little attention. In general, these researches either see mobility for empowering women or as forced immobility, as a way of maintaining women in a subordinated role and/or maintaining traditional gender relations. Hanson (2010) identifies that this literature works mainly with qualitative cases, and places attention to the context, with emphasis on the family, community or culture, focusing on living experiences and what mobility means to different people in different contexts.

For Hanson, these two literature trends are not related and seem to run on different lanes, placing a challenge for research on gender and mobility, as it is not enough to argue gender matters or that context matters, but it is imperative to show how and where it matters, and to whom. This paper aims at working in this direction by combining these two trends.

In Latin America, research on the relevance of gender in urban studies has been extensive, particularly explaining the non-neutrality of space and the importance of care and the city (Rico and Segovia, 2017) as well as the accessibility dimension has been relatively recent (Sagaris, 2019; Hernandez and Rossel, 2015; Soto, 2012; Gutiérrez, 2010). The work of Gutiérrez (2010) is particularly relevant as she highlights the relevance of accessibility and gender, and the multiple time-space barriers for women. Similarly, the work by Jiron (2007) and Jirón and Gómez (2018) has revealed the importance of mobility experiences and their interdependences to understand the multiple inequalities present in the city of Santiago. One aspect that deserves particular observation is

the way everyday life weaves together the multiple experiences of gendered spaces, thus making the division between private and public as well as reproductive and productive roles blurry, as women experience these realms as a continuum during their days. Daily mobility becomes a crucial way of making the connections between the multiple times, spaces, roles and inequalities women face on a daily basis.

In this context, differentiated mobilities are understood as non-neutral social practices, as described by Sheller and Urry: “Moving between places physically or virtually can be a source of status and power (...) or where movement is coerced it can generate deprivation and untold suffering (...). Analyzing mobilities involves examining many consequences for different peoples and places located in what we might call the fast and slow lanes of social life. There is the proliferation of places, technologies, and 'gates' that enhance the mobilities of some while reinforcing the immobilities of others” (Sheller and Urry, 2006: 213). An issue that requires greater analysis relates to the way inequality exacerbates when mobility practices and decisions are differentiated between men and women in all their interrelations, and not only as mobile individuals.

Moreover, observing mobility practices involves not only looking at adults' mobilities but also other related household members or networks, as they are inherently linked to individual mobilities. For instance, when referring to children's mobility, it is common to state the difference between dependent and independent mobility related to parents or close adults (O'Brien et al., 2000). However, previous research reveals that children's relationships with adults in mobility are not unilateral (Murray and Cortés-Morales, 2019; Jirón and Cortés, 2011; Jirón and Gómez, 2018); not only children are dependent on their parents to reach childcare or school, but their parents also depend on them to be able to accomplish productive, recreational, reproductive, and other activities. In this sense, it seems more pertinent to talk about interdependence instead of in/dependence, particularly in terms of mobility.

Additionally, interdependence does not refer exclusively to the relationship between children and adults, but also with the diverse degrees of kinship, friendship, neighborliness, comradeship, as well as work links or service provision, as well as objects and technology that make this mobility possible. From an interdependence perspective, mobility networks articulate the various productive and reproductive roles, routines, and needs of a varying number of persons. These persons are related among themselves through essential emotional and/or practical links in the organization of their daily lives, and that is currently inconceivable without the existence of the other members of these networks (Jirón and Cortés, 2011). This is particularly relevant in societies like the Chilean, where extended family plays a crucial role in care chains, particularly when the economic means make it difficult to pay for care.

Intersectionality plays an important role in mobility decisions, as the diverse positions people may have within these networks – or even outside them – depend to a great extent on the generational categories or life cycle stage in which each one is immersed. In this sense, there are stages with notoriously more responsibilities than others, which translates into more burdened roles, in which interdependence becomes a daily experienced phenomenon, determining people's organization and practices, modifying mobility behavior. For some, care responsibilities are present when parenting, but then return when grandparenting.

This interdependence, expressed in the way we observe mobility practices, emerges in the context of specific social, economic and cultural conditions, and is especially affected by the capitalist productive system and the labor conditions that emerge from it, with particular consequences on gender and generational relations, which are also context-specific, for Chile in this case and specifically for cities like Concepcion. Although in the global north, women's insertion in the modern labor market is a consolidated historical social turn, in countries like Chile, it is a more recent process whose repercussions and accommodations are sharply observed when analyzing issues such as interdependent mobility (Tinsman, 2005). This aspect is particularly relevant in issues of care, as many women and their extended mainly female care chains, require juggling their time, space and mobility to organize, coordinate, and execute care responsibilities.

These interdependent networks generate asymmetrical relations, and the roles of the network members often present acute differences in their responsibilities. Diverse female roles coincide in mobility, where women must resolve productive and reproductive chores, as well as community roles at times, in their daily movements. Although male roles are also strongly impacted by this process, their concrete manifestation seems to be mainly in the execution. While the responsibility of network planning, organization, and coordination, as well as its execution, lies mainly in women in their typical female role.

New ambiguities emerge from this perspective, which expresses a tension between gender relations and identity constitution. An example of this tension is the social and cultural role of the car, which on the one hand is the symbol of female autonomy, and on the other, an artifact to impose more domestic and caring duties. This dynamic turns many women into drivers for all their family members and even friends and distant relatives, apart from being the ones in charge of shopping and other domestic chores that require mobility (Jirón et al., 2016).

Apart from these asymmetries in gender relations, socioeconomic differences generate diverse forms, in which intersectional inequalities are solved through interdependent mobility. Family resources condition the ways interdependent networks are structured. On one hand, some resolve their interdependence by accessing greater or lesser degrees of family interdependence: Aunts and grandparents tend to carry out an essential role in younger children's child-minding, which allows other family adults to carry out their productive roles. In some cases, these links may contain symmetrical exchanges and generate forms of family organization. In other cases, where a family support network does not exist, the consequences strongly depend on socioeconomic conditions. In low-income families, a recurrent result is immobility of one family member, and generally the adult female stays at home taking care of her children. Among families with greater economic resources, the trend is to hire domestic services, to take care of and rear children.

The different ways in which interdependence is solved implies different types of social relations that are generated and expressed through daily mobility. In this sense, daily mobility analysis allows forms in which social categories – class, gender, generation – are being redefined to be observed, including relationships among them, which vary according to the types of organization and coordination. Relations between parents and children, for instance, acquire a very strong character when children require their parents for grandchild care, as the older generation acquires an essential and indirectly productive role.

Furthermore, new forms of generating, expressing, and maintaining networks among people are observed in daily mobility when attention is paid to interdependence. An illustration of this interdependence is the degree of commitment of a young couple, expressed on the way they coordinate to move in together, or the mutual concern for the journey of the other while maintaining communication through mobile phones. These specificities of daily life can be detected through closely observing interdependent mobility practices, highlighting that each decision is linked to responsibilities, chores, and desires that are orchestrated daily (Jirón and Iturra, 2014).

This provides an invitation to observe urban daily mobility from a flexible and situated perspective, that can approach people's mobility experiences, incorporating the diverse contexts and relations that take place in the complex process called mobility, which could identify different roles, positions, degrees of power, autonomy, and negotiations.

Also, the time dedicated to care activities deserves greater attention, as these have severe implications in people's mobilities and interdependencies (Sánchez-Madariaga and Zucchini, 2019; Hernandez and Rossel, 2015). These activities make people develop strategies based on the efficient use of monetary, time, and other resources, having a direct impact on their daily lives, where decisions regarding routes and transport modes are not always individual but made jointly by household members as there is often someone who assumes the role of responsibility for household mobility. In this sense, social relations become resources (Lin, 2001), and thus social networks become so crucial in mobility, when mobility capital is often reduced.

2.2. Mobility barriers

Urban daily mobility can be understood as a social practice of daily displacement through time and space, which allows individuals to access activities, people, and places (Jirón, 2010, 2011). It is the result of the interaction among people and their social context, defined by personal, interactional, physical, locational, and economic factors (Gutiérrez, 2009).

Mobility barriers involve the various obstacles for people to move through space to access activities, and other people and places (Jirón, 2017). These barriers are here presented independent of each other, and their relevance is not on itself but on the way different people experience each of them, which is often in multiple and simultaneous ways. In other words, they are conditioned by the travelers' context, such as gender, age, life cycle, ability, ethnicity, and income. As a result, the diversity in the mobility experience becomes crucial, that is, a woman traveling with young children will experience each one of these barriers differently than an older man with visual impairment or a young healthy thirty-year-old man. Among others, these barriers are the following:

- Financial, referred to the possible monetary restrictions that exist to perform daily trips; these include the possibility to pay for bus fare, own a car, or pay for tolls.
- Spatial, involving the distances and physical barriers existing in people's trajectories in the city; they also include the physical characteristics of transport modes. Examples may be unpaved sidewalks that make walking with a stroller difficult, the lack of signal posts that make orientation difficult, or stairs in metro systems that make climbing them difficult.
- Organizational, relating to the multiple schedules and other constraints coming from people's employment, schools, and other daily life organizational aspects, such as taking children to school or taking care of a sick family member.
- Temporal, relating to travel time, the start and end of activities, as well as the time of the day or season of the month or year. For example, traveling at night may be more difficult or scary than during the day, or easier during summer than winter.
- Traveling know-how, dealing with people's abilities and knowledge that help them move. For instance, knowing how to drive, change a tire, or knowing certain routes.
- Technological, related to the role information and communication technologies on people's daily mobility, and the various ways people can juggle through the available technologies. For instance, knowing how to use an application or having access to the internet.
- Corporeal/emotional, involving the embodied experience of mobility and how different bodies impact mobility practices, as well as how mobility impacts bodies themselves. This barrier also includes how emotions, such as fear, happiness, and boredom are experienced and may influence people's travel decisions. For instance, girls may feel extremely vulnerable traveling through a dark road at night and might choose not to go out at night, to be accompanied, or to pay for taxis to avoid safety risks.
- Institutional, involving the various ways private or public existing institutions condition the way we move. Possible examples are opening hours and access to coed educational establishments, as well as the availability of certain physicians in local health centers.

The way these barriers are experienced may have consequences not only in the activities people perform and their trip modes but also on aspects such as the interpersonal relationships engagements due to mobility practices. For this reason, observing the complexity and links among them, may shed light on understanding the interdependent mobility practices, and give context to coupling constraints and opportunities (Hägerstrand, 1970) derived from coordinating and constantly assessing these multiple barriers.

3. Methodology

The data come from a study performed in the city of Concepción, in the south of Chile, based on a quantitative survey applied to 120 individuals in three neighborhoods of the city, representing low, medium, and high-income groups, chosen as a way of having a diversity of key sociodemographic characteristics, such as sex, age, and occupation. A subsample of 20 cases was also approached to carry out the ethnographic observation. The survey section included a one-week time use survey, which details their location, start

and end time, out-of-the-pocket expenditure, and social interaction for each activity, as well as characteristics from each participant and their households.

The ethnographic shadowing technique involved accompanying participants on their daily routines, observing the way the participants organize and experience their journeys (Jirón and Imilan, 2015). Fieldwork was carried out by five anthropologists, three women and two men, with diverse socio-economic positions; one of them is an experienced ethnographer from Santiago in the shadowing technique who trained the other four belonging to the city of Concepción. As urban anthropologists, they have a point of view favorable to urban sustainability and social equity. Such discussions were part of the analysis in each of the cases observed. The ethnographer takes notes and records images (through filming or taking pictures), sharing and collaboratively reflecting on their experience on the move. This reflection is done either during the trip or afterward. As a situated methodology, it tries to unveil how the ethnographer's positionality might influence fieldwork (Haraway, 2016). As such, the shadowing technique is gaining relevance in mobility research, with applications by Gamble et al (2017) in Quito, Pujadas and Maza (2018) in Barcelona, and Jirón (2011) in Santiago de Chile.

The ethnographic approach involves the use of shadowing as a technique of apprehending everyday mobile experiences (Jirón, 2010, 2011). Shadowing mobile practices consist of accompanying participants in their daily journeys for a whole day. This mobile method draws from anthropological methods such as 'deep hanging out' (Geertz, 1998) during mobility or multi-sited ethnography (Marcus, 1995; 1998), and from the various developments in mobile methodologies including methods to capture multiple forms of mobility (Büscher et al., 2011), or methodologies that privilege researching everyday landscapes (Fincham et al., 2010), including go-along (Kusenbach, 2003), geographic mobile trajectories through diaries (Latham, 2003; 2004), photography (Meth, 2003), or biking experiences through video (Spinney, 2007).

In the process, participants were interviewed before the shadowing exercise, to gain an understanding of their potential journeys and also of their contexts concerning household characteristics, social, economic and cultural aspects. In this context, having applied the survey before the shadowing was helpful as the participants were aware of the research aims. Although there are indications about their travel characteristics from the interviews and surveys, the actual journeys are often very different, particularly in terms of the precision of time and coordination in executing them. Once the daily routines were over, participants were accompanied and shadowed back home, and the shadowing ended once they confirmed that they would not be making another journey that day (Jirón, 2010, 2011). The technique required being on time, so as not to delay participants and at the same time being flexible in adapting to their daily rhythms. To capture the various spatial and social interactions from the perspectives of different household members, different individuals from the same household were shadowed on different days.

The ethnographic material which emerged from the research was used as data to be analyzed collectively and comparatively among different researchers, to understand both mobility experiences as well as the significance of the journeys.

The analysis integrated the qualitative information with the time use survey, identifying the key dimensions for each case study, and visualizing those dimensions in a schematic figure. The behavioral dimensions analyzed in this study correspond to those discussed in the theoretical framework: financial, spatial, organizational, temporal, by transport mode, ability, technological, corporeal, emotional, interdependency, and social. The ethnographic narratives are complemented with the information used by the survey section, which adds the expenditure, spatial, and time use dimensions to better assess people's mobility barriers.

4. Case studies

4.1. Context

This section presents a selection of case studies using the methodology previously discussed. The mobility practices of Edith, Barbara, Marta, Carlos, and Rosario and Daniel are presented as a one-day experience. The cases were chosen based on the diverse ways in which mobility barriers are experienced.

4.1.1. Edith

Edith is a 58-year-old woman who lives in a middle-income neighborhood, together with her father and two sisters. She works as a nurse in downtown Concepción, earning a low-level salary. She has knee problems, making walking somewhat difficult. Her daily trip is from her household to her work, about two km away.

Edith is the one who is mostly in charge of taking care of their father, spending the least time possible outside of her house in her spare time. She had to make special arrangements at work to go back home at lunchtime to be with her father and being able to prepare lunch for him. This sojourn involves two extra trips during the day. As presented in Fig. 1, during the morning, she travels in a colleague's car, contributing to fuel costs, which involves a similar expenditure as if she would have used public transport. The rest of her trips are performed on public transport. Time is her main constraint, as she makes four short trips with a total expenditure of CLP\$1,760 (around US\$3.5), which involves an important share of her monthly income.

Aside from the economic dimension, the corporeal and emotional dimensions are very important on Edith's mobility strategies, because she feels unsafe on her trip to work early morning as well as in the evening during her last trip from work to home. She coordinates with her sisters for one of them to pick her up at the bus stop close to their house.

As can be seen, her mobility strategies are based on interdependent social relations. Taking care of her father involves a complex travel decision-making pattern that would not be understandable in depth by a traditional origin-destination survey, given the combinations of modes, times, and purposes. For example, the main reason for her trip home during lunchtime is not "having lunch" (or a returning trip as the traditional classifications would do) but caring for her father. Also, her possibility to travel with friends in

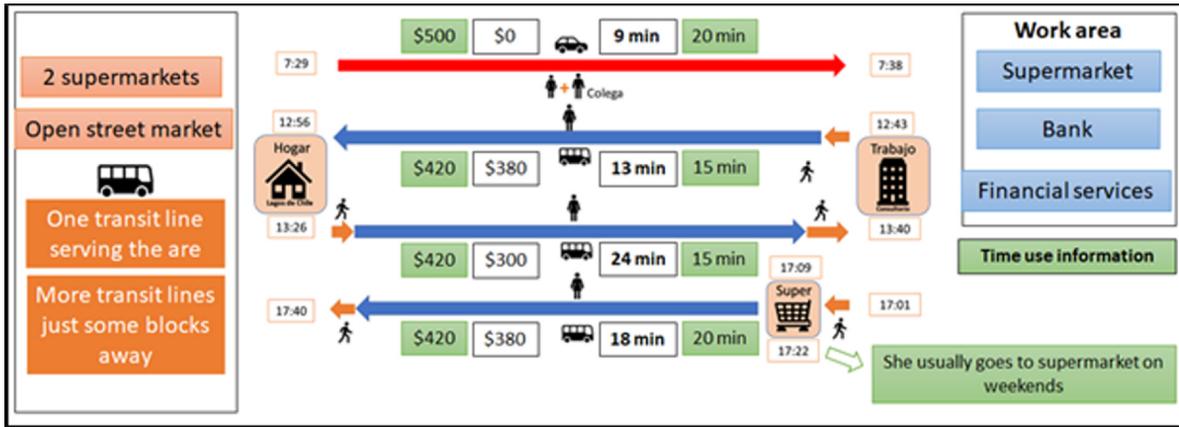


Fig. 1. Schematic figure of Edith's case.

the morning and having someone pick her up at the bus stop in the evening, constitute key strategies she deploys to overcome her emotional barriers of traveling in the city, which traditional trip-based analysis would not be able to capture.

4.1.2. Barbara

Barbara is a 29-year-old woman living in a middle-income neighborhood; she lives with her 7-year-old son, her partner – a university student – and her mother-in-law. She is her household's main income earner, working on day and night shifts. Her job schedule makes it difficult for her to take care of her son, and thus the support from her partner and mother-in-law is crucial in being able to work. However, as her son is enrolled in a school with better quality than those in her neighborhood, the only way for her son to travel to school is by using an expensive school bus, especially important during Concepcion's rainy wintertime. She lives at a long distance from work, although located closer to her son's school. Fig. 2 outlines her trip performed during the shadowing day. Although the extra shopping trip is not routinely performed, it is somewhat frequent, especially if her son needs some material for school or anything else is needed at home, involving an extra eighty minutes of travel time. Delivery trucks from work are very important as they help her to save money, taking her to downtown for free.

The corporeal and emotional dimensions in Barbara's mobility are related to her feelings of unsafety in her daily trips, especially with those trips performed at very early and late hours, fear that is enhanced due to a physical assault she experienced in the past. The financial and organizational dimensions are also important in this case, considering her interdependent mobility, as well as the trade-offs between work and school locations with her household. The distance from work is perceived by Barbara as a physical barrier to spending more time with her son. Finally, Barbara's social network is constrained to interact mostly with her core family and workmates, since her work schedule limits her free time, which privileges time at home. A traditional analysis on mode choice and ownership would be too simple for this case, since being a public transport captive user does not have consequences only for Barbara, but also for the care arrangements she has to make with her couple and mother, only helped by the seldom opportunities given by the

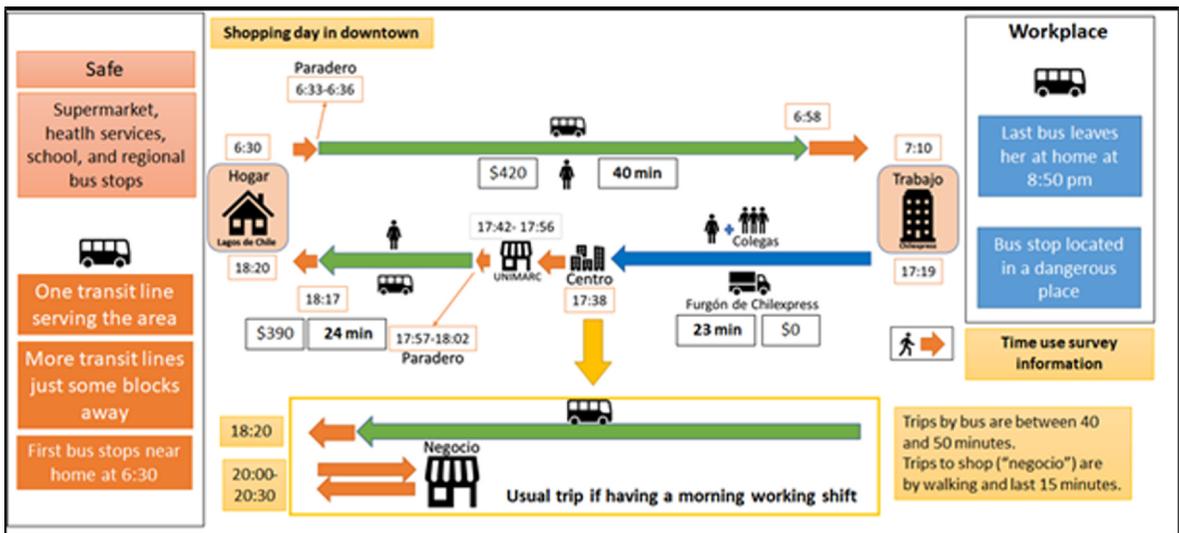


Fig. 2. Schematic figure of Barbara's case.

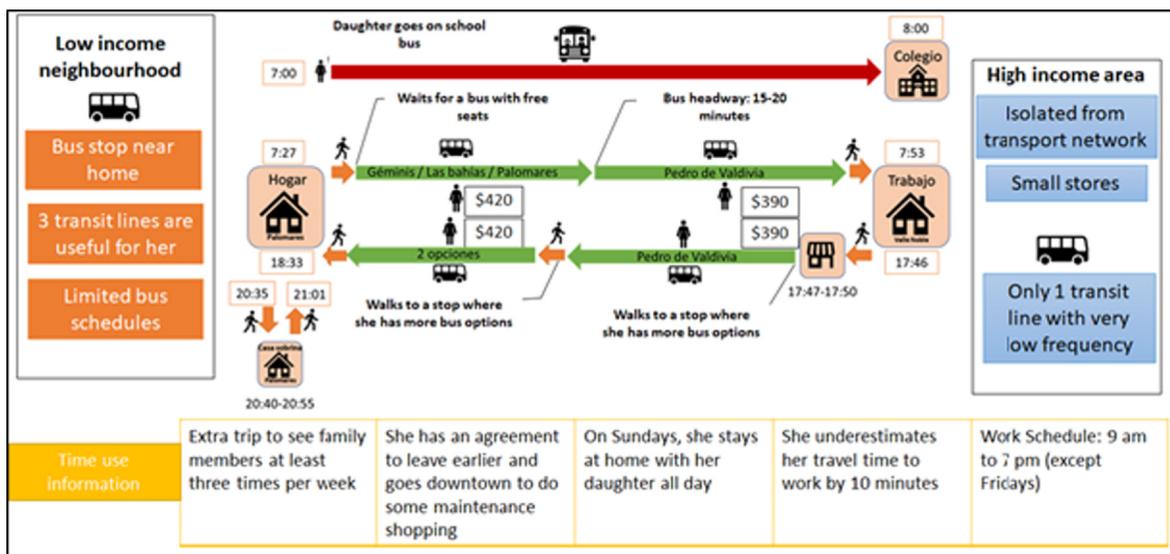


Fig. 3. Schematic figure of Marta's case.

delivery trucks from her work.

4.1.3. Marta

Marta is a 48-year-old woman living in a low-income neighborhood with her husband and their three children (two men and one woman), who are 28, 25 and 10 years old; the two older children are employed, but live with her. She works taking care of a small boy in a high-income neighborhood. Her husband has not been able to find a job for several months, and she earns a very low salary to maintain her family. Fig. 3 shows her routines.

Her neighborhood has very poor access to the transportation system, with few public transport services and low frequencies. Consequently, her daily trips consist of four bus trips, which are paid by her employer. The bus fare system is not integrated, and each trip must be paid separately. She works between 8:30 am and 7:00 pm, which makes it very difficult for her to drop her daughter to school. Since her husband is not willing to do that trip, she is forced to send her daughter at 7 am, quite early given that school starts at 8 am. When her daughter returns from school, her brothers take care of her as her husband usually is out of the household searching for jobs. Her extended family lives close to her house, constituting an important supporting network.

The financial aspect of traveling is not crucial for Marta's mobility strategies as her employer pays her transport expenditures. However, as her husband does not have a stable, formal job, she does not have the choice of adjusting a better schedule for her daily mobility, considering the long and several trip stages she has to make, and the arrangements she needs to make for her youngest daughter. On the other hand, the temporal dimension is very important for Marta, as she faces important time constraints due to her tight schedule, especially related to the forty-five minute trip for her daughter, which could be much shorter if Marta's schedules could have been different.

More importantly, there is an *interdependency in cascade*, as she takes care of her employer's son, and at the same time, her elder children take care of her daughter so that she could work. The ability dimension also plays a role as Marta has physical problems due to her age, and the public transport system does not give appropriate facilities for her needs, with steps too high and difficult physical connections among different routes.

4.1.4. Carlos

Carlos is a 44-year-old man, who lives in a high-income neighborhood with her wife Jimena and their three children, of 11, 8 and 4 years old, who go to school. He works in another high-income area in the city. Jimena oversees organizing household maintenance and childcare. His daily trip is between his home and work, as Fig. 4 presents. During the mornings, he takes his elder daughter Sara to school, and also picks up one of Sara's classmates on the way to school. His trip to work is approximately one hour long and is performed in his job provided pickup truck, while his wife uses the family car to drive the other two children. They also hired a person who takes care of their children as well as a school bus for the return trip of their youngest son.

In the neighborhood, Carlos and his wife have several friends whose children go to the same private school as theirs, providing support on alternating driving their children, something very important to reduce Jimena's daily trips. Although Jimena does not work, her children's completely different schedules complicate school logistics, especially considering that their private schools are located far from their house, a choice driven by their interest in having a better quality of education for their children given the school's unequal quality. An illustration of all this logistics is presented in Fig. 5, which illustrates the high number of trip stages, the coordination strategies using mobile phones, and the day-to-day diversity that these routines involve.

The technological dimension – in particular, the role of the mobile phone – is key here for two reasons. First, her mobile phone

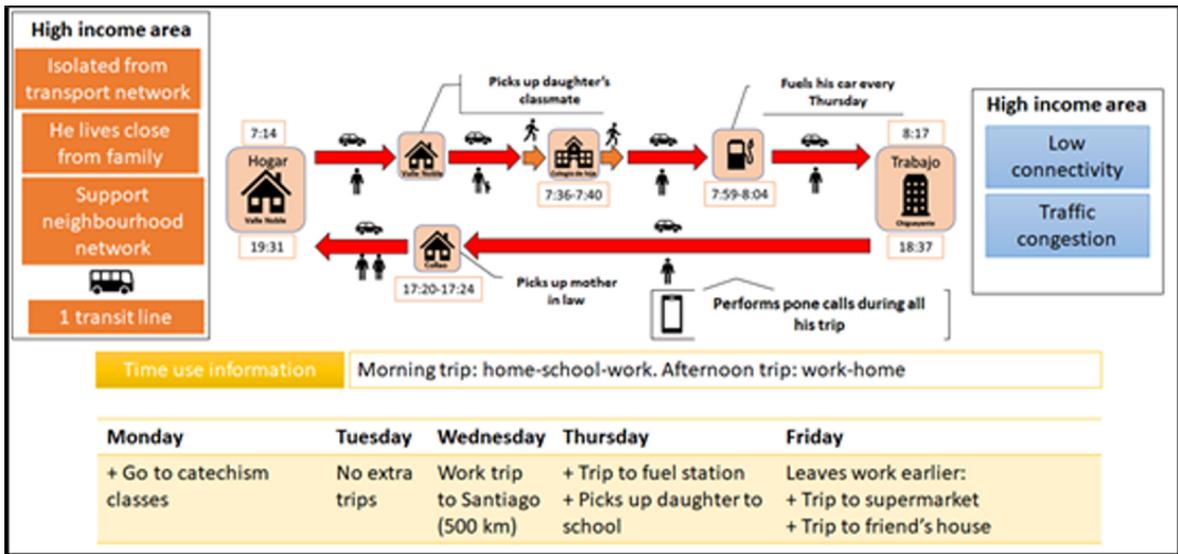


Fig. 4. Schematic figure of Carlos's case.

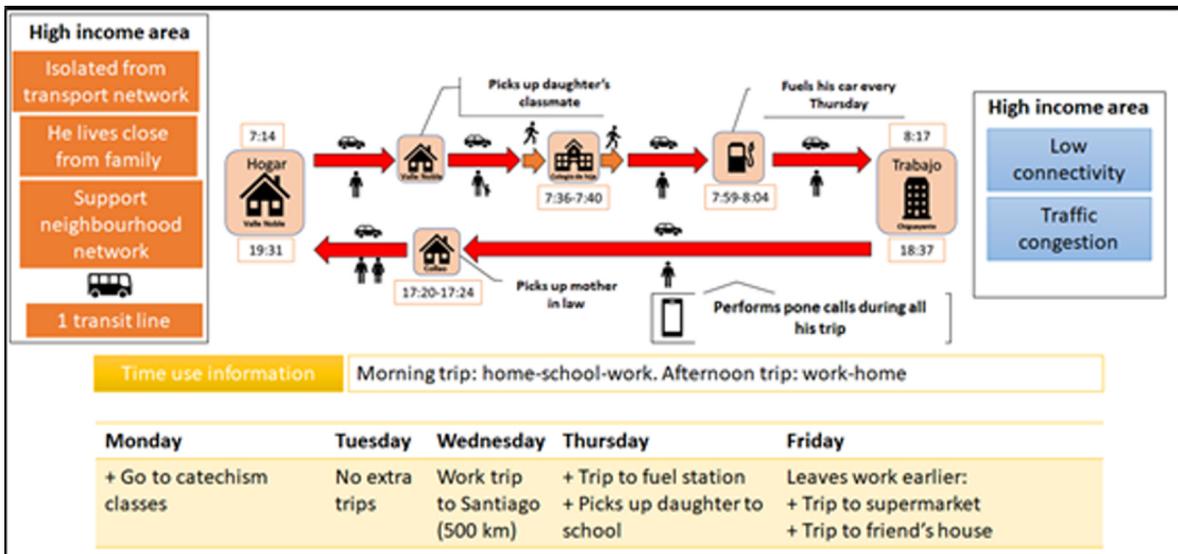


Fig. 5. Schematic figure of Carlos's children routine.

allows Jimena to coordinate with Carlos their movements and their children's, as well as regarding the support they give and receive with their neighbors. Also, it becomes a facilitator for Carlos as he can work even while driving while using his telephone.

The financial dimension becomes an important facilitator for their daily life, in terms of how their expenditures on parking, school bus, and a caretaker to facilitate their schedules. Yet, Jimena's role in terms of performing the coordination among the household members as well as driving their children to their furthest locations is crucial for Carlos to facilitate his job's schedule and daily mobility.

4.1.5. Rosario and Daniel

Rosario is 43 years old and her husband, Daniel, is 45 years old. They live together in a medium-high income neighborhood with their two-year-old daughter, Monica. Both work in downtown Concepción and have a relatively high income. Although their neighborhood is not too distant to their jobs, it is in a gated community in an area with poor public transport provision. As Fig. 6 shows, they travel together in their family car; she must start working earlier (8 am), and Daniel drives her to her job, and then arrives at his job at 9 am. An important part of their mobility strategies is related to Monica. They do not have a good quality daycare near their home and jobs, so her grandma takes her care, involving a trip that is longer than their commuting. In the mornings, Daniel makes this trip after leaving Rosario at her work, before he starts his work. In the afternoon, Rosario takes their car (parked in a place

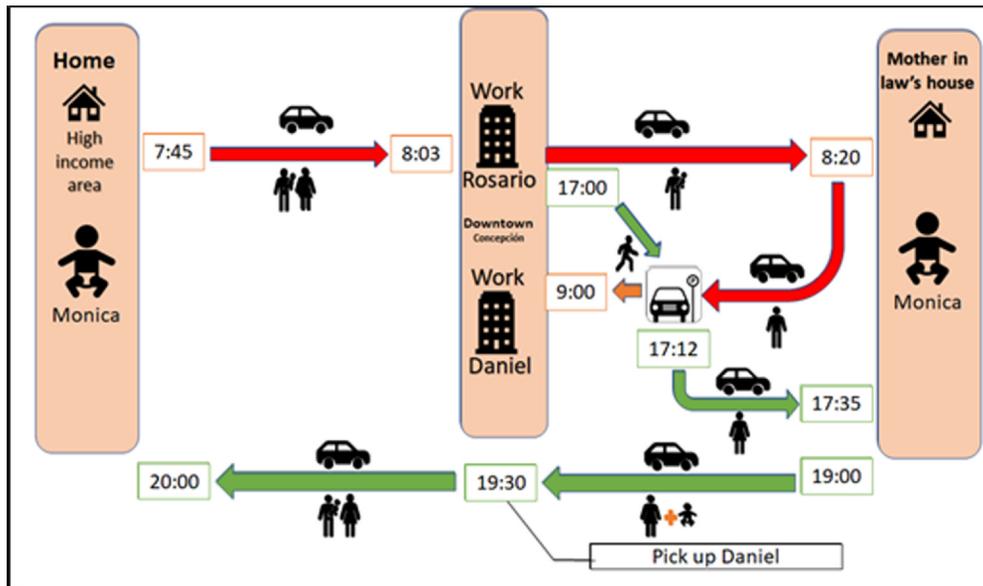


Fig. 6. Schematic figure of Rosario and Daniel's case.

strategically close to both jobs) and picks her daughter up, and then goes back downtown to pick her husband up.

This logistics involve very long car trips during the morning and afternoon, with a high level of interdependence in time and space between the couple, and with the grandmother. It also involves a continuous coordination process among the three people led by Rosario through her mobile phone. Public transport is not a convenient option for the complicated time-space pattern that their decision about taking care of their daughter generates, as well as the schedules and locations of their jobs, Monica's daycare, and where they chose to live. From a methodological viewpoint, this case highlights how individual-based analysis hides that mobility strategies have an intrinsic interactional component, especially those related to care, which involve a usually heavier responsibility for women or - as in this case - a joint strategy among parents and other caretakers.

5. Synthesis and conclusions

This paper presents a research carried out in the city of Concepcion, Chile, where time use information was combined with ethnographic studies on participants' gendered mobility strategies, which are usually not considered in traditional transport studies. The authors of this work are two women and a man (two transport engineers and an urban planner). Our goal was to study people's mobility from an interdisciplinary, intersectional, and interdependent perspective. As such, our focus was on making the effort on broadening research and methodological perspectives which could enhance the traditional transportation planning and engineering approach, still mostly focused on a commuting, infrastructure vision, with a strong male bias (Criado-Perez, 2019). Our intersectional perspective seeks to treat gender issues in mobility as broader than transport, but articulated with aspects such as income, age, and lifecycle, which are crucial to understanding people's mobility barriers. Finally, our interdependent perspective seeks to go beyond the focus on women as independent travelers, developing a gender perspective capable to see the everyday relational nature of daily activities and travel.

The above case studies highlight several dimensions related to people's gendered interdependence and mobility barriers. One of the most important ideas from the above cases is that travel decision-making, and consequent mobility strategies, are not individual, but heavily depend on other persons. Marta's interdependency to her employers and her children illustrate how chains of care are strongly shaped by spatial, temporal, and monetary constraints. These dimensions are also shaped by other less material dimensions, such as her daughter's educational performance, which influences the distant school location and the need for hiring a school bus. Similarly, the case of Edith illustrates the negotiation process she must perform with her employer to adjust her temporal and spatial barriers to take care of her father. For Edith, caring has an impact on her financial barrier, considering her high expenditure levels on public transport. Also, time poverty arises in her interview, when Edith commented that "...if I have to go to buy something downtown, I go very much in a hurry". This context also affects her available time for her social activities. In that regard, these two cases provide an example of the key roles that women play in the mobility of care, and how much their strategies to cope with financial, time, and spatial barriers are related to this objective.

Other dimensions arising explicitly in some of the cases involve corporeal and emotional barriers, mostly related to women's safety when walking or using public transport. In the case of Edith, her time constraints force her to move at very early or late hours, hence playing a significant role in her strategies to perform activities, such as seeking company and choosing safer bus stops. Similarly, in the case of Barbara and Marta, safety issues also arise from the ethnographic exercise, limiting and defining other temporal and spatial aspects from their mobility patterns. Although this dimension has been explored in the past (Hodgson, 2012),

the time use instrument and the spatial recording of these barriers are important to contextualize when this corporeal dimension is more relevant throughout the day, and which mobility strategies are deployed by these women to be able to continue performing their daily mobility routines.

The organizational dimension arises not only in terms of restrictions at work, but also at home, showing very complex temporal, spatial, travel mode, and financial arrangements among household members, and even beyond the home. This complexity explains how interdependent mobility strategies are. For example, Jimena concentrates most of her household mobility of care duties to Carlos. Although they have a high income, the school location arrangements as well as Carlos' very constrained work schedule make them require several other support dimensions for their daily mobility patterns: a school bus, a contracted help, and the exchange of support among neighbors. Differently, Rosario and Daniel distribute their caring chores by moving their daughter, heavily relying on grandmother; interestingly, their longest and most congested trip, and their more complicated mobility strategies are not related to commuting to work, but on taking care of their small daughter.

The possibility daily mobility offers to observe the complexities of everyday life become evident in these types of studies. Feminist scholars have long expressed the importance of both unveiling differentiates gendered spatial experiences as well as the importance everyday life has in order to join the fragmented ways in which urban studies analyze and intervene space. Observing the continuum of everyday life helps to unravel the blurry limits between traditionally dichotomic urban observation including private and public space, productive and reproductive roles, individual vs interdependent decision making, as shown in the cases above.

Then, as urban daily mobility can be understood as a social practice of daily displacement through time and space, ethnographic studies including shadowing techniques, offer a useful perspective to broaden our understanding of the people's gendered context in their daily mobilities. In that regard, access to urban opportunities becomes a comprehensive issue, where mobility strategies are not only mediated by space, time, and money, but also by other social manifestations such as gender roles and expectations towards children's achievement. These aspects translate into understudied aspects, such as mobility of care patterns and other complex arrangements that go beyond the simplified perspective of daily travel mostly driven by commuters to work.

The ethnographic method presented in this paper constitutes a useful approach to identify the gendered mobility complexities in cities in general, particularly in the Latin-American context. The method highlighted how a variety of aspects such as work schedules, daycare facilities, shopping facility availability, and social support network locations, play a key role in women's mobility in this context. For example, although the public transportation system in Concepción has good spatial coverage and speed in commuting times, its frequency and convenience are worse at other times of the day when some of the women from the previous cases require an adequate service to perform their caring trips. This overemphasis of commuting trips on the discussions regarding the public transportation system in Chile hides the relevance of mobility of care in daily life. Similarly, the complex time-space arrangements as those illustrated in the case studies, often imply spending a long time in the transportation system, and walking at late hours, involving corporeal and emotional stress rarely acknowledged in the design of the transport system. Finally, the contrast between low- and high-income women remarks on how the availability of resources "hides" key limitations of the transportation system in the city to serve properly caring activities and disparate household member schedules.

Overall, and from a policy perspective, the cases remark that the impact of interventions in the transportation system and its potential behavioral changes (e.g., travel mode use, trip characteristics) require a gendered lens, which could go beyond the simplified, male-commuting trip paradigm, and could incorporate the intrinsic embeddedness of mobility in a broader range of complex daily life activities.

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References

- Büscher, M., Urry, J., Witchger, K., 2011. *Mobile Methods*. Taylor & Francis Books, Abington.
- Criado-Perez, C., 2019. *Invisible Women: Exposing Data Bias in a World Designed for Men*, Penguin Random House, UK.
- Duran, M., 2012. La investigación sobre el uso del tiempo", documento preparado para la Décima Reunión Internacional de Expertas y Expertos en Encuestas de Uso del Tiempo y Trabajo No Remunerado, Ciudad de México, 11 y 12 de octubre [en línea] <http://cedoc.inmujeres.gob.mx/Seminarios/utiempo/2012/AngelesDuran.pdf>.
- Fincham, B., McGuinness, M., Murray, L., 2010. *Mobile Methodologies*. Palgrave Macmillan, Basingstoke.
- Gamble, J., Snizek, B., Nielsen, T., 2017. From people to cycling indicators: documenting and understanding the urban context of cyclists' experiences in Quito, Ecuador. *J. Transp. Geogr.* 60, 167–177.
- Geertz, C., 1998. Deep hanging out. *New York Rev. Books* 45 (16), 69–72.
- Grieco, Margaret, Mcquaid, R., 2012. Editorial Gender and transport: an editorial introduction. *Res. Transp. Econ.* 34(1), 1–2.
- Gutiérrez, Andrea, 2009. Movilidad y Acceso: Embarazo y Salud Pública en la Periferia de Buenos Aires. Extended abstract. XV CLATPU, Marzo 2009: Buenos Aires.
- Gutiérrez, Andrea, 2010. "Movilidad, transporte y acceso: una renovación aplicada al ordenamiento territorial". *Revista Electrónica de Geografía y Ciencias Sociales*, pp. 1–25.
- Hägerstrand, T., 1970. What about people in regional science? *Papers Regional Sci. Assoc.* 24, 7–21.
- Hanson, S., 2010. Gender and mobility: new approaches for informing sustainability. *Gender, Place & Culture. A J. Feminist Geogr.* 17 (1), 5–23. <https://doi.org/10.1080/09663690903498225>.
- Hanson, S., Pratt, G., 1995. *Gender, Work and Space*. Routledge, London.
- Haraway, D., 2016. *Staying with the Trouble. Making Kin in the Chthulucene*. Duke University Press.
- Hernandez, Diego, Rossel, Cecilia, 2015. Inequality and access to social services in Latin America: space-time constraints of child health checkups and prenatal care in Montevideo. *J. Transp. Geogr.* 44, 24–32.

- Hodgson, F., 2012. Escorting economies: networked journeys, household strategies and resistance. *Res. Transp. Econ.* 34 (1), 3–10.
- Hayden, D., 2005. What would a nonsexist city be like? Speculations on housing, urban design, and human work. In: Fainstein, S., Servon, L. (Eds.), *Gender and Plan.: A Reader*, Rutgers University Press, New Brunswick.
- Jarvis, H., 2005. Moving to London time: household co-ordination and the infrastructure of everyday life. *Time Soc.* 14 (1), 133–154. <https://doi.org/10.1177/0961463X05050302>.
- Jiron, P., 2007. Unravelling invisible inequalities in the city through urban daily mobility. The case of Santiago de Chile. *Swiss J. Sociol.* 33, 45–68.
- Jiron, P., 2010a. Mobile borders in urban daily mobility practices in Santiago de Chile. *Int. Political Sociol.* 4, 66–79.
- Jiron, P., 2017. “Capítulo XIII. Planificación urbana y del transporte a partir de relaciones de interdependencia y movilidad del cuidado”. Rico, M.N. y O. Segovia (Ed) (2017) *¿Quién cuida en la ciudad? Aportes para políticas urbanas de igualdad*. Serie Desarrollo Social Naciones Unidas CEPAL.
- Jiron, P., 2011. On Becoming “la sombra/the shadow”. In: Büscher, M., Urry, J., Witchger, K. (Eds.), *Mobile Methods*. Taylor & Francis Books, London, pp. 36–52.
- Jirón, P., Gómez, J., 2018. Interdependencia, cuidado y género desde las estrategias de movilidad en la ciudad de Santiago. *Tempo Social*. 30 (2).
- Jirón, P., Cortés, S., 2011. Mobile relations, mobile shadows. Understanding contemporary urban daily living through shadowing techniques, paper presented at International Workshop: The Everyday Life of Multi-Local Families. Concepts, Methods and the Example of Post-Separation Families, October 20 - 21 2011, Munich, Germany.
- Jiron, P., Milán, W., 2015. Embodying flexibility: experiencing labour flexibility through urban daily mobility in Santiago de Chile. *Mobilities* 10 (1), 119–135.
- Jirón, P., Iturra, L., 2014. Travelling the journey: understanding mobility trajectories by recreating research paths. In: Murray, L., Upstone, S. (Eds.), *Researching and Representing Mobilities: Transdisciplinary Encounters*. Palgrave Macmillan, London.
- Jirón, P., Milán, W., Iturra, L., 2016. Relearning to travel in Santiago: the importance of mobile place-making and travelling know-how. *Cultural Geogr.* 23 (4), 599–614.
- Kusenbach, M., 2003. Street phenomenology: the go-along as ethnographic research tool. *Ethnography* 4 (3), 455–485.
- Kwan, M.-P., 2005. Gender differences in space-time constraints. *Area* 32 (2), 145–156.
- Latham, A., 2003. Research, performance, and doing human geography: some reflections on the diary- photograph, diary-interview method. *Environ. Plan. A* 35 (11), 1993–2017.
- Latham, A., 2004. Researching and Writing Everyday Accounts of the City. An Introduction to the Diary-Photo Diary-Interview Method. In Knowles, C., Sweetman, P. (Eds.), *Picturing the Social Landscape: Visual Methods and the Sociological Imagination* (London: Routledge, 2004), pp. 117–131.
- Law, Robin, 1999. Beyond women and transport: towards new geographies of gender and daily mobility. *Progr. Human Geogr.* 567–588.
- Lin, N., 2001. Building a network theory of social capital. In: Lin, N., Cook, K., Burt, R. (Eds.), *Social Capital: Theory and Research*. Routledge, New York, pp. 1–26.
- Magro, T., Muxí, Z., 2012. “Las mujeres constructoras de ciudad desde los movimientos sociales urbanos”, *Archivo crítico modelo Barcelona, 1973-2004*, J. Montaner, F. Álvarez y Z. Muxí (eds.), Barcelona, Ayuntamiento de Barcelona/Universidad Politécnica de Cataluña (UPC) [en línea] <http://fundacion.arquia.es/files/p>.
- Marcus, G., 1995. Ethnography in/of the world system: the emergence of multi-sited ethnography. *Annu. Rev. Anthropol.* 24, 95–117.
- Marcus, G., 1998. *Ethnography through Thick and Thin*. Princeton, Princeton University Press.
- Massey, D., 1994. *Space, Place and Gender*. Polity Press, Oxford.
- McDowell, L., 1999. *Gender, Identity and Place. Understanding Feminist Geographies*. Polity Press, Oxford.
- Meth, P., 2003. Entries and omissions: using solicited diaries in geographical research. *Area* 35 (2), 195–205.
- Miralles-Guasch, C., Martínez Melo, M., Marquet, O., 2016. A gender analysis of everyday mobility in urban and rural territories: from challenges to sustainability. *Gender, Place Culture. A J. Feminist Geogr.* 23 (3), 398–417. <https://doi.org/10.1080/0966369X.2015.1013448>.
- Muller, T., 2019. Gendered Space. In: Orum, Anthony (Ed.), *The Wiley Blackwell Encyclopedia of Urban and Regional Studies*. John Wiley & Sons Ltd. <https://doi.org/10.1002/9781118568446.eurs0116>.
- Murray, L., Cortés-Morales, S., 2019. *Children's Mobilities. Interdependent, Imagines, Relational*. Palgrave Macmillan, London.
- O'Brien, M., Jones, D., Sloan, D., Rustin, M., 2000. Children's independent mobility in the urban public realm. *Childhood* 7, 257–277.
- Pujadas, J.J., Maza, G., 2018. Daily mobility and urban sprawl. In: Ferro, L., Smagacz-Poziemska, M., Gómez, M., Kurtenbach, S., Pereira, P., Villalón, J. (Eds.), *Moving Cities – Contested Views on Urban Life*. Springer VS, Wiesbaden.
- Rico, M.N., Segovia, O., 2017. *¿Quién cuida en la ciudad? Aportes para políticas urbanas de igualdad*. Serie Desarrollo Social Naciones Unidas CEPAL. No. 150. 476 p.
- Sagaris, L., 2019. Gendering smart mobilities in Latin America. Are 'smart cities' smart enough to improve social justice? Uteng, T. (Ed.), Christensen, H. (Ed.), Levin, L. (Ed.). (2020). *Gendering Smart Mobilities*. London: Routledge, <https://doi.org/10.4324/9780429466601>.
- Sánchez de Madariaga, I., 2016. “Mobility of care: Introducing new concepts in urban transport”. En Inés Sánchez de Madariaga y Marion Roberts (eds.), *Fair Shared Cities: The impact of gender planning in Europe*. Londres, Routledge.
- Sánchez-Madariaga, I., Zucchini, E., 2019. Measuring mobilities of care, a challenge for transport agendas: from one to many tracks. In: Scholten, C.L., Joëlsson, T. (Eds.), *Gender into Transport Planning*. Palgrave Macmillan, London.
- Sheller, M., Urry, J., 2006. The new mobilities paradigm. *Environ. Plan. A* 38.
- Soto, P., 2012. “El miedo de las mujeres a la violencia en la Ciudad de México. Una cuestión de justicia espacial”. *Revista INVI*, vol. 27, n°75, pp. 145–169. Santiago de Chile.
- Spinney, J., 2007. ‘Cycling the City: Movement, Meaning and Practice’ (PhD Thesis, Department of Geography, Royal Holloway, London, 2007).
- Tinsman, H., 2005. Feminist labor history and Marxist Legacies in Latin American Studies. *WerkstattGeschichte* 41 (1), 27–46.
- Uteng, Tanu P (2011), Gender and Mobility in the Developing World. World Development Report 2012, Gender Equality and Development. Background Paper. <http://siteresources.worldbank.org>.
- Valentine, G., 1989. The geography of women's fear. *Area* 21 (4), 385–390.