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Persistence of walking in Chile: lessons for urban sustainability

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ABSTRACT


An extensive body of work from the urban planning, health, and other disciplines has documented the importance of walking to urban sustainability from health, safety, security, environmental and other perspectives. These studies come mainly from countries in North America and Europe, where the majority of the population relies on cars for transportation. Notwithstanding, in many countries in the Global South, walking remains a majority transport mode, while cars increasingly dominate the urban streetscape, but are accessible only to a minority of the population. Chile provides fertile terrain for studying this phenomenon. This article reviews current practice and recent research of walking in Chile, in light of international findings regarding walkability, equity and urban sustainability. To elaborate an overview of the depth and breadth of walking in Chile, an interdisciplinary team conducted a literature review, examined relevant case study material from experience from Chile and in particular from Santiago, and triangulated this mainly qualitative data with results from the origin-destination survey applied in Chile's main cities, Chilean traffic safety data) and results from official transport reports of other Latin American cities [Tirachini, A. (2019). South America: The challenge of transition. In J. Stanley & D. Hensher (Eds.), *A research agenda for transport policy*. Northampton, MA: Edward Elgar Publishing]. Findings show that despite priority public investments that have largely prioritised infrastructure for cars, walking in Chile has remained as the majority transport mode up until today, especially for lower-middle income groups, and particularly for care-related tasks performed mainly by women. In this sense, walking in Chile has proven remarkably persistent. The importance of walking as the main transport mode, against the odds, reflects economic, cultural, and urban form determinants, which are explored in this article. Furthermore, a recent upsurge in public interest and community design initiatives to improve walking, particularly the generation of a Chilean approach to “complete streets” has emerged, opening up opportunities to challenge Chile's version of automobility in favour of more equitable, active and public transportation modes. There is, therefore, in Chile an opportunity to prioritise the walking mode, improve infrastructure for walkers and build from preserving current high pedestrian modal shares,

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rather than having to reverse widespread car use, as occurs in many countries in Europe and North America. This potential is highly relevant as these conditions are similar to those in other Latin American cities and, potentially, other cities elsewhere in the Global South.

1. Introduction

An extensive body of work from the urban planning, health, and other disciplines has documented the importance of walking to urban sustainability from health, safety, security, environmental and other perspectives, mainly in countries in North America and Europe, where the majority of the population relies on cars for transportation. Results indicate that promoting walking should be a key policy to encourage sustainable and healthier urban living. Walking is not only a sustainable transport mode, it also improves mental and physical health (Hill, Wyatt, Reed, & Peters, 2003; Morgan, Tobar, & Snyder, 2010; Williams & Thompson, 2013), facilitates social interaction and urban vitality (Gehl & Gemzo, 1996, 2006; Jacobs, 1961; Whyte, 1980) and permits citizenship (Loukaitou-Sideris & Ehrenfeucht, 2009). In this context, the concepts of “walkability” and “walkable environments” have attracted growing interest worldwide, including new urban agendas.

However, the relationship between walkability, mobility and urban planning is complex and to some degree uncertain. Indeed, the term walkability does not have a unique definition but many: some definitions refer to the urban characteristics and physical infrastructure behind walkable places, others to the social or health-related results of walkable environments, and in other cases walkability is even used as a proxy for good urban planning (Forsyth, 2015).

Also, much of the literature on walkability has dealt with the individual, group or physical environmental factors that affect walking (Alfonzo, 2005). However, few studies so far have proposed explanatory theories on the relative importance of these factors in influencing walking behaviour. Alfonzo (2005) proposes that a Maslowian-type pyramid of “needs” tends to explain (though not determine) walking behaviour. According to her, the most basic need for walking to happen is feasibility, meaning that people should be physically able to walk, or that this behaviour (walking) is not prohibited. The following steps in this pyramid are in order of importance accessibility, safety, comfort and pleurability, all of which belong to the urban planning sphere. Notwithstanding, Alfonzo’s perspective is far from deterministic: rather, she suggests that individual, social and cultural group characteristics, can moderate the impact of urban planning features on walking.

Most studies to date on walking and walkability examine cities in North America, Europe and Australia, where the use of the car is widespread, due to the suburbanisation patterns of development applied post-world war II, advertising and the far-reaching effects of cars on banking, retail, manufacturing, tourism, service and other industries. For example, in the United Kingdom, Hillman and others (1999) first raised the alarm regarding automobility, as it was replacing walking and cycling trips to school at rates that threatened children’s physical and mental development, including their spatial orientation, social and other skills crucial for the development of human society (Tonucci, 2004). In the United States, Frumkin, Frank, and Jackson (2004) published a foundational book

linking urban sprawl to mental and physical health problems, particularly the “obesity epidemic”.

Extensive studies, mostly in the United States, have underlined the links between walking and urban form, health, safety and security, in determining the degree of “walkability” of a city or a district. For example, Zacharias (2001) examined pedestrian perceptions as they related to the built environment, while Cervero and other authors examined health and mode choices associated with suburban living in the United States (Cervero, 1989, 2002; Cervero & Duncan, 2003), often contrasting American patterns of travel with those in Asia or elsewhere in the world (Cervero, 2000). Echoing Jane Jacobs foundational text (1961), several teams of North American researchers (Forsyth, Krizek, & Weinstein, 2010; Krizek & Waddell, 2001; Krizek, Handy, & Forsyth, 2009; Saelens, Sallis, & Frank, 2003; Sallis et al., 2016) have further documented the relationship of walkability with urban form, particularly density, connectivity and other factors. Other studies have highlighted the relation between walking and cycling (Buehler & Pucher, 2017), and linked high levels of walking and cycling with higher levels of road safety (Jacobsen, 2003; Jacobsen, Racloppi, & Rutter, 2009; Jacobsen, Ragland, & Komanoff, 2015), which has become known as “safety in numbers”.

Key thinkers (Beckmann, 2001; Sheller & Urry, 2000; Urry, 2004) have defined the crucial problem for sustainable urban living as “automobility”, dominance of the car driven by economic, social, cultural and ideological factors, while others (Bulkeley, Castán Broto, Hodson, & Marvin, 2011; Geels, 2012) have laid bare the complex network of institutions and path dependency that generate substantial barriers to change.

Others have emphasised the importance of relinquishing thinking based on “average” commuters, who are usually male, go straight from home to work and back again. Instead, there is growing evidence that focusing on specific segments of the population, particularly women (Alcaíno, Domarchi, & López Carrasco, 2009; Allen & Vanderschuren, 2016; Allen, Cárdenas, Pereyra, & Sagaris, 2019; Anand & Tiwari, 2006; Arora, 2009; Beebejaun, 2016; Byrnes, Miller, & Schafer, 1999; Jirón & Gómez, 2018; Jirón & Zunino Singh, 2017; Sagaris & Arora, 2015; Sagaris & Arora, 2018; Soto, 2012) and older adults (Gagliardi et al., 2004; Loukaitou-Sideris, 2019; Oxley, Corben, Fildes, & O’Hare, 2004), can open up new avenues for potential change. Similarly, children, denied safe travel and play spaces on roads due to car-centred urban planning and parents’ perception of risks, increasingly suffer from pathologies once associated mostly with old age, inspiring a plethora of practices based on “safe routes to school” and related studies (Banister, Pucher, & Lee-Gosselin, 2007; Boarnet, Anderson, Day, McMillan, & Alfonzo, 2005; Chriqui et al., 2012; McDonald, 2007; Staunton, Hubsrnith, & Kallins, 2003; Tonucci, 2004).

Seeking remedies, many North American researchers have looked to Europe for potential strategies, finding examples of successful practices in the walkability and cycleinclusive strategies applied in specific cities, such as Freiburg and Copenhagen. Many key authors emphasise the need for integral, ecological approaches that place a high priority on social participation in decision-making and implementation, to optimise the potential success of these very challenging transitions (Banister, 2008; Buehler & Pucher, 2011; Evans & Karvonen, 2011; Gehl & Gemzo, 1996, 2006; Kenworthy, 2006; Newman & Jennings, 2008; Newman, Beattie, Trubka, & Selvey, 2015; Sagaris, Tiznado-Aitken, & Steiniger, 2017; Smith, 2011). To date, many of these efforts have been applied in the Complete Street agenda (Hui, Saxe, Roorda, Hess, & Miller, 2018; McCann, 2013; Smart Growth America &

National Complete Streets Coalition, 2015), which aims to create streets that are safer, more vibrant and inclusive (in terms of the variety of both transport modes and users). In essence, this involves giving equal value to two central functions: the social function of the street, as a public space (that is, “place making”), and the mobility function, expanded to consider all the different transport modes.

Hence, a growing body of research on walking and walkability can be observed in countries in North America and Europe, which link mobility and health to urban planning. Research on walking and walkability in most countries in the Global South, however, remains scarce, although there are signs of growing interest among researchers, particularly in Latin America, to address these issues. A Latin American perspective promises to make a significant contribution, given that walking remains a majority transport mode, despite the fact that cars increasingly dominate the urban streetscape, but to date remain accessible to a minority of the population only, raising questions of transport justice as highlighted by Latin American researchers (Gutiérrez, 2010; Herrmann, 2016; Jirón & Gómez, 2018; Jirón & Zunino Singh, 2017; Pavez Reyes, 2011; Sagaris et al., 2017; Sagaris & Landon, 2017; Soto, 2012). Moreover, as the rest of the world begins to transition towards urbanisation, many Latin American countries have already virtually completed this process. This is particularly true of Chile, where 88% of the population lives in cities small and large, and 40% of the population lives in the metropolitan region and capital of Santiago, with a population of 6.5 million people.

Indeed, Chile provides fertile terrain for studying this phenomenon. In 2014 the National Urban Development Policy established walking as a priority to meet sustainable development goals (Ministerio de Vivienda y Urbanismo & PNUD, 2014). Since the late 1980s, however, urban planning, streetscape design and transport systems in Chile have reflected the global expansion of “automobility” (Beckmann, 2001; Sheller & Urry, 2000), that is, the car as a vehicle for social progress, freedom, economic development and other social goals. Nevertheless, and despite priority investments in infrastructure for cars, walking in Chile persists as the majority transport mode, especially for lower-middle income groups and amongst woman (Figueroa & Forray, 2015; Jirón & Gómez, 2018; Sagaris & Tiznado-Aitken, 2020; Sectra, 2012).

2. Methods: interdisciplinary collaboration to triangulate qualitative and quantitative results of walking in Chile

This article reviews current practice and recent research of walking in Chile in order to elaborate an overview of the depth and breadth of walking in Chile, in light of international findings regarding walkability, equity and urban sustainability. To establish a deeper sense of walking, its current status among Chileans and its potential for contributing to more sustainable transport policies overall, especially in Latin America, we brought together an interdisciplinary team to conduct a literature review (academic literature and grey literature), examine relevant case study material from experience from Chile, and triangulate this mainly qualitative data with results from the origin-destination survey applied in Chile’s main cities every ten years or so (*Encuesta Origen Destino EOD*) (Sectra, 2001, 2012, 2018), traffic safety data (Conaset, 2019) and results from official transport reports of other Latin American cities (AMB, 2016; GAMLP, 2012; GESP, 2013; ICLEI, 2017; MTC, 2013; SGP, 2015; Tirachini, 2019).

With this aim, the next Section 3 of this article presents an overview of walking in Chile within its planning context, emphasising that walking persists as the most important mode for daily trips, especially for lower-middle income groups, and particularly for care-related tasks performed mainly by women. Furthermore, this section highlights a recent upsurge in public interest and community design initiatives to improve walkability, particularly the generation of a Chilean approach to “complete streets”.

The discussion Section 4 analyses why walking in Chile has remained as the majority transport mode up until today, notwithstanding priority public investments in infrastructure for cars, and reflects upon how cultural, environmental, economic and urban form determinants present in most Chilean cities have contributed to the persistence of walking in Chile.

Finally, a conclusion Section 5 reflects on what these experiences can tell us about challenges and opportunities associated with walking, walkability and related research in a context where walking remains a majority mode, despite decades of policies based on exclusion, inequity and automobility.

3. Persistence of walking in Chile

3.1. Planning traditions and priorities: car-oriented planning

Urban planning, transport planning and streetscape design in Chile – and in Latin America in general – have been car-oriented for the last thirty years up until today (Herrmann, 2016; Pavez Reyes, 2011). In this sense, Chile’s car centred planning clearly reflects the globalisation of automobility, with high investments for motorised vehicles and in particular, urban highways.

The introduction of urban highways in Chile, and specifically in Santiago, began in the nineties, a period of rapid economic growth (about 7% each year), that followed the military dictatorship (1973–1990). Automobility’s proponents argued that for Chile to continue growing at these rates, it should expand roads to allow people in cars to move more freely around the city and its periphery (Echeñique, 2006). Under Chile’s neoliberal policies, urban highways were planned by the government, usually as part of Build, Operate and Transfer (BOT) concessions, leaving the private sector in charge of building and operations, particularly collecting revenues and maintenance.

To attract private investors, government proponents offered contracts guaranteeing revenues of up to 75% of the initial investment (González, 2014), a highly debatable arrangement considering that in 2017 alone, urban highway concessions earned record profits of US\$ 215 million. In this context, from 2004 to 2015, seven major urban highways, totalling more than 200 km, were built.

Fifteen years after the first urban highway in Santiago, the city has expanded significantly (De Mattos, Fuentes, & Link, 2014; Ducci, 2002), absorbing surrounding towns and villages into Greater Santiago (Fuentes & Pezoa, 2018), and generating large patches of gated communities lacking walkable environments. The highways have also isolated large swathes of the city, affecting low-income communities in particular (Figueroa, Greene, & Mora, 2018; Sagaris & Landon, 2017) and excluding those who cannot afford to use them (Greene & Mora, 2005).

Chile's car-centred planning is also reflected in urban investment, which is heavily inclined towards the improvement and enlargement of existing roads and new highways. Indeed, an analysis of the fiscal spending in transport projects between 2010 and 2016 in the city of Santiago, shows that 30% went to subsidies for urban highways, 7.7% to improvements and reparation of existing roads, 49% to new subway lines, 13% to public transport, and 0.2% to cyclepaths (Coalición por un Transporte Justo, 2016). Moreover, national transport planning assigns no dollar amounts to walking and reports indicate that just 2.8% of transport investment went to walking between 2010 and 2016 (Sagaris & Tiznado-Aitken, 2020). The lack of urban investment in sidewalks is further reflected in their poor maintenance: according to a recent report 32% of sidewalks in Chile's main cities are in poor conditions (Cámara Chilena de la Construcción, 2014).

But not only public investments have favoured motorised transport, also urban planning and regulations have clearly been car-oriented at the cost of more active transport modes, particularly walking and cycling. Chile has a highly centralised land use planning system, in which local authorities have little decision-making powers compared to those of national ministries and their regional secretariats. Pedestrian space is insufficiently defined and insufficiently considered at all three (national, regional, and local) planning levels. On the contrary, planning regulations consistently promote and ensure the mobility of motorised traffic at all scales.

At the national level, for example, the General Ordinance of Urbanism and Construction (*Ordenanza General de Urbanismo y Construcciones*) defines the street as a "vehicular road of any type that communicates with other roads and that includes both roads and sidewalks" (Ministerio de Vivienda y Urbanismo, 2010, Article 1.1.2), making motorised vehicles the priority on all streets and ignoring their role as multifunctional public spaces that should be equally available to cyclists and pedestrians, and for social, civic and cultural activities. A redefinition of the street as a shared, multifunctional and more democratic space for all transport modes is urgently required both at the national and local level.

These regulations also set rigid standards for minimum and maximum width of vehicular lanes and sidewalks, making roads wide and sidewalks narrow, by definition (Herrmann, 2016). For example, two-lane roads must be 7 m wide, regardless of the speed limit, or if it is a local or trunk road (Ministerio de Vivienda y Urbanismo, 2010). In contrast, the minimum width for sidewalks is just 1.2 m for residential areas and 2 m for commercial areas, which is clearly undersized. As occurs elsewhere, many Chilean streets – especially in lower-income neighbourhoods – have no sidewalks, unpaved sidewalks or undersized sidewalks. Other problems are sidewalks overcrowded with posts, signs, parked cars, and other equipment, and sidewalks lacking greening, lighting and maintenance (Herrmann & Mora, 2018). Hence, many sidewalks in Chile do not have an adequate physical infrastructure to allow for safety, accessibility and comfort, key factors in influencing "walkability".

3.2. Institutional aspects and governance

The main planning instrument in Chile at the local level (municipal jurisdictions known as *comunas*), consists of bylaws (*Plan Regulador Comunal*), which establish zoning (land use), street hierarchies and widths. Local governments have little authority over roads, and within roads, pedestrian and cycling facilities. National ministries or their appointed, regional secretariats, make most decisions regarding transport, land use, environmental

and other planning issues. Indeed, to date, walking itself – despite being promoted by the National Urban Development Policy (Ministerio de Vivienda y Urbanismo & PNUD, 2014) – is not really in the mandate for any particular government agency: local, regional or national.

Furthermore, there are few instruments to ensure meaningful participation of community organisations and stakeholders in the planning and design of streets, although some progress has been made with local civil society advisory committees (known as *Cosocs*), established in 2011 by national law, but only partially implemented in many jurisdictions. Some specific programmes have also successfully tapped into the possibilities of greater participation for local communities to pave streets, for example, the *Programa de Pavimentación Participativa* (Ministerio de Vivienda y Urbanismo, 1994).

Despite Chile's car-oriented planning, there have been some historic pedestrian-friendly initiatives which still play a crucial role in emblematic parts of the city, such as the pedestrian galleries (developed 1930–1960) and pedestrianised streets (from 1977 onward) in Santiago's historic centre, and the pedestrian passages of the upscale retail area of Providencia (from 1990 onward). Indeed, Santiago's first pedestrian area was built amidst considerable controversy in 1977 (Herrmann & Mora, 2018), and quickly became some of the most socially and commercially successful real estate in the whole metropolitan region. Notably, this was just shortly after pedestrian zones began to re-emerge in Europe in the 1960s (Kostof, 2004). Since then, pedestrianisation has expanded throughout Santiago's city centre, to cover 3.9 km of streets, flanked by numerous shopping facilities. These are complemented by a network of more than seventy pedestrian "galleries", that is, interior walkways within usually commercial buildings, with a total extension of 6 km in length (Herrmann & Mora, 2018). Notably, this rich pedestrian network has contributed significantly to make Santiago's historic centre a very diverse, vital and socially mixed quarter in a segregated city (Herrmann & Mora, 2018).

Similarly, based on New York's "incentive zoning" (Cook, 1982), in 1990 the Municipality of Providencia offered a density bonus to promote pedestrian passages (Municipalidad de Providencia, 1990). This promoted the creation of passages and commercial galleries in the interior of the urban block which today total 1.2 km in length, adding up to 5000 m² of new public space (Mora & Zapata, 2004), and have significantly improved pedestrian connectivity and accessibility (Schlack, 2015). These are exceptions, however, in a transport planning system that has clearly favoured cars over other transport modes.

3.3. High percentage of walking in the modal share

Despite car-oriented planning, walking remains the majority modal share in Chile in general and in Santiago in particular. Over the past 30 years, moreover, origin-destination surveys have documented the ongoing importance of walking. Indeed, walking is the largest single mode in Santiago (34.5%) and if we consider the "sustainability trio", that is walking, cycling and public transport trips, these account for 64% of daily travel in Santiago, a significant percentage, with cars accounting for only 26% of daily trips (Origin-Destination Survey) (Sectra, 2012).

Similarly, intermediate and smaller cities post high modal shares for walking (Arica = 36.0%, Coquimbo/La Serena = 36.0%, Iquique = 33.9%, Copiapó = 29.8%, Antofagasta = 28.3%,

Gran Valparaíso = 26.1%, Temuco = 24.5%, San Antonio = 23.9%, Valdivia = 23.1%, Osorno = 20.1% and Puerto Montt = 18.5%) (Sectra, 2018) (Figure 1).

Walking, moreover, has held its own over time (Sectra, 2018), decreasing only slightly in Santiago by 2% between 2001 and 2012, and even increasing in Arica, Antofagasta, Coquimbo/La Serena and Gran Valparaíso (Table 1). Exceptions are San Antonio and Valdivia, where walking has decreased.

Evidently, some of the walking trips¹ are missed in existing surveys in Chile. However, it should be noted, that Chilean mobility study methods tend toward the top of world standards (Ampt & Ortúzar, 2004; Ampt, Ortúzar, & Richardson, 2009). The Santiago survey, which is the most advanced, began in 1996 and has been applied again in 2001 and 2012.² The most recent version, used here (Sectra, 2012), applied a carefully designed random survey of all members (60.000 people) of 18.000 households (11.246 during work days, 7.018 on weekends).

3.4. Disparities and equity

A closer look reveals important equity considerations, however, especially in the case of Santiago. As a result of spatial reorganisation during the military regime (1973–1990), an analysis of Santiago's 34 urban *comunas* or municipal planning areas reveal that both wealth and car ownership are mainly concentrated in four to six, located on the city's eastern edge, rising into the Andean foothills. Despite four decades of increasingly car-centred planning and economic development, just 40% of households have cars (Sagaris et al., 2017).

As in other Latin American countries, vehicle ownership in Chile is deeply linked to income. Notwithstanding, the continuous economic growth experienced by the country in the last twenty years has made car ownership more accessible for lower-income groups. For example, while the number of vehicles per household was 0.13 in the lower-income group in 2001, compared to 1.5 vehicles per household for the higher-income group, in 2012 it was 0.17 and 1.65 respectively (Herrera & Razmilic, 2016). In other words, between 2001 and 2012 car ownership grew 31% in the lower-income group and 17% in the higher-income group (Herrera & Razmilic, 2016). It should be noted, that in this context of growing car ownership, in the same period between 2001 and 2012, walking trips in Santiago decreased only slightly from 36.7% to 34.5%. Interestingly, this fall was originated in the lower and middle-income groups – who started acquiring more cars – and not in the higher-income groups. Indeed, between 2001 and 2012 walking trips decreased from 53% to 48.7% for lower-income groups and from 36.2% to 31.5% for middle-income groups, but increased from 14.7% to 20% for higher-income groups (Herrera & Razmilic, 2016).

Notwithstanding, up until today, walking in Chile persists as the majority transport mode, especially for lower and middle-income groups, and particularly for care-related tasks performed mainly by women. Walking accounts for more than half of daily trips in some of Santiago's poorest *comunas*, particularly Pedro Aguirre Cerda (57.6%), Pudahuel (57.2%), Conchalí (54.3%), El Bosque (52.3%), Cerro Navia (51.3%) and Lo Espejo (50.6%), with women accounting for a high percentage of walkers (56% to 77%) (Sectra, 2012).

Data on trip purpose suggests this reflects the still traditional organisation of urban space and life, particularly outside the high-income suburbs in the rest of the city. In

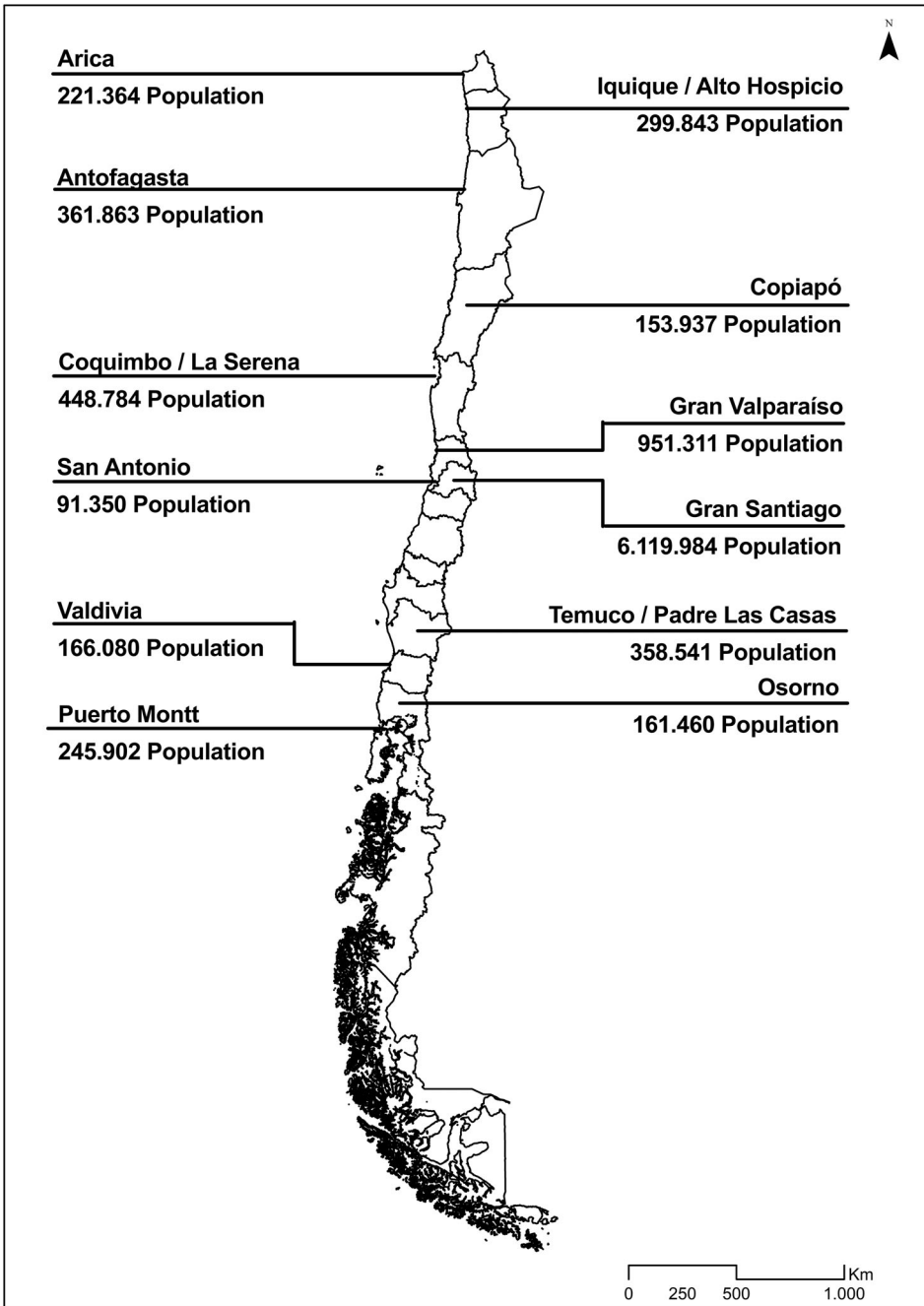


Figure 1. Chilean cities with transport surveys.

Source: Own elaboration based on INE (2018).

these areas, grocery stores are located within walkable distances in most neighbourhoods and street fairs bring fresh produce two or three times a week, generating both work and an accessible supply of nutritious foods for 70% of lower-income groups (FAO, ODEPA, &

Table 1. Pedestrian modal share in Chilean cities.

City	% (year previous EOD)	% (year current EOD)
Arica	33.0 (1998)	36.0 (2010)
Iquique	n/a	33.9 (2010)
Antofagasta	23.3 (1998)	28.3 (2010)
Copiapó	n/a	29.8 (2010)
Coquimbo-La Serena	34.0 (1999)	36.0 (2010)
Gran Valparaíso	18.0 (1998)	26.1 (2014)
San Antonio	45.0 (2005)	23.9 (2017)
Gran Santiago	36.7 (2001)	34.5 (2012)
Temuco	n/a	24.5 (2013)
Valdivia	33.5 (2002)	23.1 (2013)
Osorno	n/a	20.1 (2013)
Puerto Montt	n/a	18.5 (2014)

Notes: Pedestrian Modal Share in Chilean Cities (%) in Previous and Current EOD (Transport Survey).

Source: Own elaboration based on Sectra (2018). Retrieved from https://www.sectra.gob.cl/encuestas_movilidad/encuestas_movilidad.htm, December 2018.

ASOFTCP, 2013; Weisstaub, Mora, Greene, Herrmann, & Bosch, 2017). The same origin-destination data reveal that women account for twice to three times the men travelling to shop, access health and other government services, or visit, pick up or drop off others (Sectra, 2012). When these trips are combined under a single category, “care” – picking someone up or dropping them off, buying food, health –, they actually account for 47% of daily trips and 64% of weekend trips, more than work (38%), education (10%) and recreation (6%) (Sagaris & Tiznado-Aitken, 2020).

These figures reveal both the challenge for equity and the opportunities for sustainability that could be developed more fully through adequate coordination of land use and transport planning. While this high percentage of walking trips, mostly by women, enhances environmental sustainability, these figures also suggest that their dependency on walking and public transport may play a significant role in their limited participation in the work force, in politics and other key aspects of society.

Furthermore, in Chile, as in many other Latin American cities, streets and public transport are spaces of sexual harassment, especially for women (Jirón & Zunino Singh, 2017). Indeed, a recent study of journeys involving walking and public transport found high levels of sexual harassment affecting 73% of women, with the walk to and from access points being a significant factor, and even those on low incomes, preferring to save up for a taxi (Allen et al., 2019). Certainly, many low-income communities experience lower walkability at the home-end of the trip and higher walkability at the destination-end of the trip (workplaces are often located in higher and middle-income areas with better pedestrian facilities). In the case of Chile, accessibility and safety are probably the most relevant problems regarding walkability, especially in lower-income areas. Indeed, scarce public transport alternatives in poor areas mean that inhabitants, who are reliant of this mode of transportation, have no alternative but to enter sometimes dangerous zones (Figueroa et al., 2018), a phenomenon that affects women’s capacity to move in the city, restricting their mobility (Figueroa & Waintraub, 2015; Mora, Greene, & Reyes, 2018; Paydar, Kamani-Fard, & Etminami-Ghasrodashti, 2017).

Furthermore, several emerging studies using ethnographic and gender-sensitive methods have contributed to the studies of the corporality and embedded practices of walking in Chile, further revealing gender disparities and inequality (Jirón & Iturra, 2014;

Jirón & Mansilla, 2014; Lazo & Calderón, 2010; Tironi & Mora, 2018). For example, contrasting the travel experiences of two men, one living in a low-income and the other in a high-income community, Jirón and Mansilla (2014) found that “urban dwellers experience urban fragmentation by devising different mobility strategies to weave their way through the disconnected, interrupted and segregated spatialities into which the city has been decomposed, resulting in fragmentation of the spatial aspects of daily life” (Jirón & Mansilla, 2014, p. 5). In effect, while the high-income subject travels smoothly in his car through an open “tunnel”, the low-income subject combines walking and public transport to travel through an equivalent tunnel characterised by narrow sidewalks that are difficult to navigate, a harsh and dirty urban landscape, with specific limitations on the times during which he can (safely) travel (Jirón & Mansilla, 2014, p. 20).

3.5. Intermodal conflicts and opportunities

A closer look at intermodal trips reveals other conflicts and opportunities in regards to walking in Chile. For example, while walking accounts for 34.5% of the daily trips in Santiago, public transport (bus, taxi *colectivo*, metro, train) accounts for 29.1%, private motorised transport (car, taxi and motorcycle) for 28%, and cycling for 4% of the daily trips (Sectra, 2012). Within public transport 78% of daily trips are realised by bus (52% bus only, 26% bus-metro combined), whilst 46% are undertaken by metro (22% metro only, 26% bus-metro combined) (Sectra, 2012). It should be noted, that many of the journeys realised on public transport include a “first and last mile” realised on foot, increasing the already high percentage of walking in the modal share. However, strategies to improve first and last mile connections on foot and/or bike, have so far been neglected in Chile, and require much more attention.

Importantly, many conflicts in everyday mobility occur at “intermodality”, often due to lack of universal design (Jirón & Imilán Ojeda, 2018). It should be noted, that low-income families³ rely on a public transport system that provides relatively rapid service in central areas, but involves long waits – often at intermodal transport stops – and limited service on the outskirts, where people live (Figueroa et al., 2018). Unfortunately, transport planning has so far focused mainly on each transport mode separately and neglected “intermodality” and the relevance mobility practices have on daily life, lacking an integrated approach on intermodal transport (Jirón & Lange, 2017).

Other important conflicts affecting walking are pedestrian accidents and deaths, especially concerning more vulnerable users, such as children and older adults. Urban safety in Chile is monitored by Conaset (National Bureau of Traffic Safety, acronym in Spanish): official statistics on traffic safety can be traced back to 1972 and show that, while the number of vehicles per one-hundred inhabitants grew significantly from 4 in 1972 to 30 in 2018, the number of fatal injuries has diminished in the same period (1792 against 1507). More disaggregated data on accident types started being registered in 2002 and are displayed in Table 2. As shown, pedestrian fatalities have diminished by about 30% between 2002 and 2018, totalling 537 in 2017 and 2018, while the percentage of all fatalities involving pedestrians has dropped from 46% in 2002 to 36% from 2016 onwards (Conaset, 2017). Furthermore, in 2018 the Ministry of Transport reduced speed limit in urban zones from 60 to 50 km/hr as a means to reduce road fatalities.⁴ Recent figures published by the Ministry of Transport show that

Table 2. Information on pedestrian deaths from 2002 to 2012.

Year	Number of pedestrian deaths	% of pedestrian deaths from all fatalities	% of non-fatal injuries of all accidents
2002	705	46%	18%
2003	785	46%	17%
2004	817	46%	17%
2005	712	44%	16%
2006	668	40%	14%
2007	660	40%	17%
2008	712	40%	16%
2009	575	38%	16%
2010	627	39%	16%
2011	608	39%	16%
2012	583	38%	15%
2013	631	39%	15%
2014	615	38%	15%
2015	564	34%	15%
2016	603	36%	14%
2017	537	36%	14%
2018	537	36%	14%

Note: Pedestrian Accidents and Death.

Source: Own elaboration based on Conaset (2017). Retrieved from <https://www.conaset.cl/programa/observatorio-datos-estadistica/>

since the reduction of the speed limit, accidents have decreased by 7%, while deaths have reduced by 3% (La Tercera, 2019). Although this is a minor speed reduction, it shows that pedestrian safety is gaining momentum in urban policies in Chile. This is an important issue, since pedestrian safety is a key factor of walkability in Chile, especially amongst older adults and children, due to parents' high perception of traffic risk.

3.6. The new initiatives: the Chilean version of “walking by design”

Interestingly, a recent upsurge in public interest and community design initiatives to improve walking and walkability, particularly the generation of a Chilean approach to “complete streets” has emerged, opening up opportunities to challenge Chile’s version of automobility in favour of more equitable active and public transportation modes.

A recent example is Santiago’s city centre mobility plan (*Plan Centro*), a comprehensive policy to improve infrastructure in Santiago’s original town centre. Launched in 2013, the *Plan Centro* sought to promote non-motorised mobility, by improving the walkability of a heavily used, central part of the city, which combines major retail, government, heritage and other activities, bringing in almost 2 million people daily (de Santiago, 2015).

This Plan was the first of its kind in Chile to explicitly give pedestrians and cyclists priority over private cars. On-street parking was eliminated and lanes for cars were replaced by major improvements to sidewalks and other pedestrian amenities, cycle-ways, and improvements to bus stops (Figure 2). The Plan allocated 60% of eight major roads to public transport with a strict prohibition for cars during weekdays, enforcing this measure using cameras, and increasing space for pedestrians and cyclists.

These measures initially stirred opposition among store keepers, drivers and some residents, as people feared their mobility would be more limited. Notwithstanding, works started in 2015 in *Merced* street, and expanded in 2016 to two additional streets (*San Antonio* and *Santo Domingo*). Sidewalks increased by 33%, as on-street car parking was



Figure 2. Plan Centro, Santiago (*Banderas and Merced*).

Source: Own elaboration.

eliminated and pavement width reduced. By 2017, this Plan had received numerous awards, particularly the prestigious Sustainable Transport Award, which had previously gone to Paris, London and New York, among others.

This has become a growing phenomenon countrywide, with significant streets or segments in historical centres being pedestrianised in many cities. Pedestrian zones have crept into urban design in Chile's largest cities, Santiago (6.5 million people), Greater Valparaíso (1 million people) and Greater Concepción (1 million people), but also in mid-sized cities (Arica, Iquique, Antofagasta, Calama, Rancagua, Curicó, Talca, Chillán, Los Angeles, Valdivia, Osorno, Puerto Montt, etc.). These pedestrian zones now stretch from as short as 50 m to 1.4 km, lined by stores, typically urban trees, street furniture, street vendors, and other activities, and have been very well received by local communities.

Similarly, Sunday open street initiatives based on Colombia's internationally acclaimed "Ciclovía" are also flourishing, after a decade of entanglement in bureaucratic structures that almost strangled this pedestrian-friendly urban innovation. CicloRecreoVía, as it is known in Chile, is a recreation-oriented programme that generates a network of car-free streets on Sunday mornings, which attract thousands of users, mostly walking, skating and cycling. Created in Bogotá, Colombia, in the early seventies, this policy has spread throughout the Americas, and is now practiced regularly in 33 countries (Torres, Sarmiento, Stauber, & Zarama, 2013), involving more than 1.5 million people every week (Sarmiento et al., 2017).

In Chile, this programme started in 2007 and currently operates in seven *comunas* of Santiago, as well as in the cities of Concepción and Antofagasta. According to Geomas (2018), the company in charge, more than 33 km of streets are closed every week, allowing for a weekly participation of about 30,000 people. Although the CicloRecreoVía is not, strictly speaking, a programme aiming at enhance walkability in cities, the recreational and family-oriented atmosphere contributes to the development of physical fitness, and a walking and cycling-friendly culture. The programme has also helped to at least partly reduce the acute social segregation of Santiago, by offering a space for social interaction and recreation (Mora, Greene, & Corado, 2018).

Paradoxically, this resurgence of walking also owes much to a significant rise in the number of cyclists using urban spaces. Cycling infrastructure has expanded from

198 km in 2013 to 345 km in 2018 (Mapcity, 2018), with its modal share doubling from 2% in 2006 to 4% in 2012 (Sectra, 2012), and is now estimated at 7%. This rapid expansion generated significant conflicts between cyclists and pedestrians, since many cyclists started using sidewalks to ride. Thus, in the past decade, sidewalks have become contested spaces, as is occurring with scooters in San Francisco or Barcelona.

Another reason why walkability has gained increasing attention seems to be related to a series of urban regeneration policies, practiced over the past fifteen years at the local scale. Although these policies have not focused on walking but on urban renewal, their main objective, the improvement of public space in often deprived neighbourhoods has also encouraged walking. For example, a programme known as “I Love my Neighbourhood” (*Quiero mi Barrio*) launched in 2007, has invested heavily in local parks, plazas and sidewalk improvements, to improve public space and social capital in low-income neighbourhoods throughout Chile. Since 2015, a similar programme focusing on business redevelopment, the *Programa de Barrios Comerciales*, aims to improve the competitiveness of traditional high streets in cities throughout Chile, improving sidewalks and making them more appealing to users, especially women, for whom walking often imposes a safety “cost” (Figueroa & Waintraub, 2015; Mora, Greene, & Reyes, 2018; Paydar et al., 2017).⁵ In addition, walking has been strengthened in Chilean cities by a growing interest in urban life in central areas, often associated with gentrification (Inzulza-Contardo, 2016; Lees, Bang Shin, & López-Morales, 2016).

4. Discussion

As has occurred all over the world, in Chile too streetscape design and transport planning became particularly car-centred over the past thirty years, reflecting how the globalisation of automobility has played out in an extreme neo-liberal context. Despite this trend, walking in Chile has proven remarkably persistent, and remains by far the most important mode for daily trips. In this sense, walking in Chile can be described as “persistent walking”.

Clearly, a few key factors have helped to preserve walking as a significant option in Chile. Low-incomes, which remain prevalent, make car ownership and every motorised trip – even on public transit – a burden for restricted wallets and therefore encourage walking, particularly for care-related tasks performed mainly by women. It is evident that socio-economic factors combined with the spatial distribution of wealth and poverty interact to influence walking. In Chile, per capita GDP rose from US\$ 4.595 in 2001 to US\$ 15.431 in 2012 (World Bank, 2018), and car ownership rose with it, in Santiago, from 125.7 vehicles/1.000 inhabitants to 177.9 vehicles/1.000 inhabitants in the same period, rising almost 50% in just ten years. Averages can deceive, however, since far from being evenly spread among the population, as occurs with income, car ownership is still mainly concentrated among a minority of mainly high- and some middle income households (Sagaris et al., 2017).

Nonetheless, other researchers have pointed out that the idea that soaring car ownership or use inevitably accompanies rising GDP is not supported by the evidence: alternative ways of managing these phenomenon and alternative trends are clearly emerging (Kenworthy, 2013). Notably, car ownership rose almost 50% between 2001 and 2012 in

Santiago, but walking fell only slightly, from 36.7% to 34.5% (Sectra, 2001, 2012). For higher-income groups walking trips even increased within this period, despite growing car ownership (14.7% to 20%) (Herrera & Razmilic, 2016).

Another important factor which plays a key role in promoting walkability in Chile is the urban form and layout of Chilean cities. Most Chilean cities were founded and developed as orthogonal grids (*damero español*), comprising highly accessible and well connected networks, which favour pedestrian movement (Herrmann & Mora, 2018). Urban blocks range from 90 up to 120 m in size and allow for a permeable, compact and mixed-use urban development. It should be noted, that many Chilean cities have retained this pattern, particularly in central and peri-central areas, and communities developed in the first half of the twentieth century.

In addition to this, most Chilean – and Latin American – cities have substantially higher density than American counterparts and are more akin to European cities in that regard (Inostroza, Baur, & Csaplovics, 2013). Even extended low-rise development areas in Santiago and other large Chilean cities can exhibit very high densities and mixed uses, a diverse range of local shops and services, local schools that could encourage more walking and cycling to school, and street fairs that set up in most neighbourhoods two or three times a week.

Furthermore, large Chilean cities, and especially Santiago, have experienced an acute process of urban renewal in their inner-city areas in the last twenty years, that permitted Santiago's city centre and most of its adjacent districts, to start gaining population after decades of depopulation. This process has been accompanied by a demographic change expressed in shrinking families (the number of children per women passed from 1.6 to 1.3 between 2002 and 2017), a surge in one-person households (from 12.6% to 17.5% in the same period), and an increasingly ageing population (those over 65 years passed from 8.1% to 11.4% between 2002 and 2017), and a reduction in the number of people per household from 3.6 to 3.1 (INE, 2018). These trends were expressed in the urban form as flats surpassed houses as the most popular urban dwelling in large Chilean cities.⁶ In sum, walkability seems to be favoured by a "resurgence" and repopulation of inner-city areas, a phenomenon that has been widely studied in academic spheres (Contreras, 2011; De Mattos et al., 2014; Greene, Mora, & Berrios, 2011; López-Morales, 2016). However, unfortunately, and as a consequence of the globalisation of "automobility", many Chilean cities have also grown in their periphery through car-oriented sprawling and low-density gated communities, designed for middle- and higher income groups, often based on cul de sacs, which lack the highly accessible and well connected layout of the traditional grid, generating environments of low walkability.

Another socio-cultural factor why walking has remained high in Chile in particular, and in Latin America in general, could also be related to the intense use of public space by Latin American cultures, through street markets, street fairs, street festivals, among others. This can be seen in many public space innovations created in Latin American countries, for example, the Open Street programme (Montero, 2017). Not in vain, the street in Chile has historically been called "the living room" of the people. In fact, vibrant street fairs generate two or three times a week, both work and accessible supply of nutritious foods for 70% of lower-income groups (Weisstaub et al., 2017).

Notably, other interesting particularities regarding walkability awareness can be observed in the case of Chile. Unlike countries in the United States, United Kingdom or

Australia, where active modes of transportation were initially promoted by academics in the medical sphere and then adopted as policies nationwide (Frank, Engelke, & Schmid, 2003; Moudon et al., 2007; Saelens & Handy, 2008; Sallis, Floyd, Rodríguez, & Saelens, 2012), health policies in Chile have until now largely ignored the role of the physical environment as an intervening factor in making more people active (Ibarra & Mora, 2011; Mora, Greene, & Corado, 2018). For example, the current National Health Objectives 2012–2020 (de Chile, 2012), a document of more than 350 pages, dedicates only two paragraphs to the role of cities and urban planning in making people more active, in spite of the fact that 86.7% of Chileans are sedentary (de Salud, 2017), and that 87.8% live in cities (INE, 2018).

In other words, walking has remained high not as a result of a top-down, ministry-driven initiative, but more because of bottom up, cultural and people-driven behaviour, reflected in many recent local initiatives to promote walking, propelled by local *comunas* (or municipal planning areas), citizens and communities. Although in 2014 the Chilean National Urban Development Policy established walking as a priority to meet sustainable development goals, most initiatives to improve walkability have emerged at the local scale.

Interestingly, modal shares for other Latin American countries (Tirachini, 2019; ICLEI, 2017) suggest that far from being an outlier, Chile could be part of a general tendency of “persistent walking” in cities throughout Latin America. Table 3 shows that walking accounts for from one-fifth to one-third of trips in most Latin American capitals, with the exception of Quito, where walking is only 14.5% (this may reflect how travel is studied, however, since some methods neglect non-motorised modes).

Although travel surveys used across cities are not always comparable, a high percentage of walking can be observed in many Latin American cities. Indeed, just as walking accounts for 34.5% of all trips in Santiago (Chile), we also find high modal shares elsewhere in major Latin American cities: 31.1% in Bogotá (Colombia), 28.0% in Sao Paulo (Brazil), 24.3% in Lima (Perú), 20.4% in La Paz (Bolivia) (Tirachini, 2019) and 21% in Curitiba (Brazil) (ICLEI, 2017). In comparison, according to Buehler and Pucher (2012), only 5% of daily trips are by foot in Australia, 11% in the United States and 11% in Canada. European countries rank higher, from 16% (Belgium) to 25% (Netherlands).⁷

However, further research would be required to see if Chile’s case could be part of a general tendency of “persistent walking” throughout Latin American cities, especially

Table 3. Modal share local trips in Latin American cities.

	City	Walking (W)	Cycling (C)	Public transport (PT)	Taxi/ others	Private transport (car)	PT + W + C = sustainable
LATIN	Santiago	34.5	4	27.9	7.9	25.7	66.4
AMERICA	Bogotá	31.1	4.3	42.2	11.2	11.2	77.6
	Sao Paulo	28	0.7	37.8	7.8	25.8	66.5
	Lima (Callao)	24.3	0.3	50.8	9.4	15.2	75.4
	Curitiba	21	5	45	5	24	71
	La Paz	20.4	0.1	72.3	2.8	4.4	92.8
	Quito	14	0.3	52.0	14	19.8	66.3

Note: Modal Share Local Trips in Latin American Cities (%).

Source: Own elaboration using data from: (i) Tirachini (2019) elaborated from the following sources: La Paz (GAMLPL, 2012), Santiago (SECTRA, 2012), Bogotá (AMB, 2016), Sao Paulo (GESP, 2013), Quito (SGP, 2015), Lima and Callao (MTC, 2013); (ii) Curitiba (ICLEI, 2017, retrieved from https://ecomobility.org/wp-content/uploads/2017/10/REPORT-2017_Final_web_.pdf). Note: Different methodologies of the surveys limit the comparability of the modal shares shown. However, it gives a good approximation of the magnitude of the use of each mode in each city.

giving the geographical, environmental and socio-cultural differences along Latin America. A significant challenge to date, though, is that data and research on walking and walkability in Chile – and Latin America – remains scarce, although there are signs of growing interest among researchers to address this issue. A Latin American perspective could make a significant contribution, given that walking has remained a majority transport mode in many cities. Hence, more research and interdisciplinary collaborations on walking – and its socio-cultural, environmental and urban determinants – are required in Latin America both in the public policy arena and the research sphere, to contribute to more sustainable transport policies.

5. Conclusions: walking for social justice and inclusion

Walking in a Latin American context such as Chile, where inequalities, needs and affordability vary enormously among the general population, and spatially within our highly segregated cities, has shown significant persistence. For decades, the walkability of the urban system – understood as levels of feasibility, accessibility, safety, comfort and pleasurability – has been severely challenged by automobility. Notwithstanding, and despite priority public investments in infrastructure for cars, walking in Chile has remained as the majority transport mode up until today, especially for lower-middle income groups, and particularly for care-related tasks performed mainly by women.

The persistence of walking as a main mobility mode in Chile raises important questions about the type of strategies needed for preserving and increasing walking's importance as a measure with very significant health, environmental, social equity and other benefits. Yet, the challenge is not only to preserve or increase walking shares, but to do so in a way that further dignifies and prioritises walking as a key mobility mode and urban activity.

As noted in this article, a recent upsurge in public interest and community design initiatives, particularly the generation of a Chilean approach to “complete streets” and “cycle-inclusion” has emerged, opening up opportunities to challenge Chile's version of automobility in favour of more equitable, active and public transportation modes. There is, therefore, an opportunity to build from preserving current modal shares, rather than having to reverse widespread car use, as occurs in many countries in North America and Europe. This potential is highly relevant as these conditions are similar to those in other Latin American cities and, potentially, other cities elsewhere in the Global South.

In this context, the potential to retain or increase current levels of walking and at the same time prioritise the walking mode, is especially important to achieving a more sustainable and socially just transport system in Chile, particularly from a gender perspective. Improving universal design, traffic security and safety – especially for women –, would be a key strategy to influence people's, and in particular women's, willingness to walk and cycle, the two main non-motorised or “active” modes of transport. Furthermore, switching short car trips to walking and/or cycling and improving intermodal integration and transport stops could be central to increase and prioritise walking. In order to do so, more investment to enhance infrastructure for walkers is needed -by, for example, widening and greening sidewalks-, considering that only 2.78% of public investment in roads is directed to improve walking (Iglesias, Giraldez, Tiznado-Aitken, & Muñoz, 2019).

This also indicates a major challenge for Chile's highly fragmented governance system. To date, walking itself is not really in the mandate for any particular government agency at the national, regional or local scale. Hence, coordination among different sectorial planning departments (transport, urban planning, etc.), and between the national and local government is urgently needed. Furthermore, a revision of Chilean national standards for streets and sidewalks (sidewalks are undersized by law), is required to improve the physical infrastructure for walking. Finally, at the local level, new local policies to promote walking and walkability need to be developed through close collaborations between municipal government staff and community organisations, especially in deprived neighbourhoods, where walkable environments and public spaces have been neglected.

Notably, unlike other nations, such as the United States and United Kingdom, where walking has been promoted by health and urban policies (either at the local or national level), at least in the case of Chile, the surging interest for walking has resulted from the concomitance of various trends at the local level, many of which were not specifically but laterally related to walking (for example, the increasing use of sidewalks by cyclists). Hence, the challenge to promote walking should pay attention to the particularities of each city and community, in order to understand the reasons capable of mobilising people and organisations interested in promoting walking.

All this requires drawing in a much broader segment of the population and civil society organisations, especially those representing or led by women, through more sophisticated participatory planning approaches, based on deliberation and collaboration among citizen organisations and government, to design more pedestrian-friendly streets, and achieve more sustainable and healthier cities and neighbourhoods. There is a clear need for integral, ecological approaches that place a high priority on social participation in decision-making and implementation, to optimise the potential success of these very challenging transitions towards more walkable, sustainable and healthier cities.

Notes

1. Chile's Transportation Secretary (Sectra, 2012) defines a trip as a displacement made in the public realm with a specific purpose between two places (origin and destination). A trip can be done in various transport modes and consist of one or more stages. A walking trip is defined as a trip made by foot only.
2. It is worth noting that the 2012 Santiago survey included in total 45 *comunas*, while the 2002 Santiago survey only included 38 *comunas*.
3. It is important to note that "low-income" denotes a majority of Chilean households, in one of the world's least equal economies, with 50% earning less than US\$562/month (World Bank, 2014).
4. Notably, a national network of civil society foundations and activists campaigned for six years to get road speeds reduced.
5. This scheme has so far transformed sixty decaying commercial precincts in all regions of Chile (Sercotec, 2018).
6. Indeed, according to a recent research carried out in Santiago, internet searches for flats passed from 59% to 78% in the largest real estate web engine of Chile (La Tercera, 2018), reflecting a change in people's living preferences.

7. Notwithstanding, walking has even declined in Western Europe, such as in Germany (by 30%), the UK (by 50%) and in France (by 56%) over the last thirty years, a period where per capita income grew (Buehler & Pucher, 2012).

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