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RESEARCH ARTICLE

Understanding accessibility as lived experience: the case of walking and cycling in Porto Alegre, Brazil

Júlio Celso Borello Vargas [a], Ben Spencer [b] and Tim Jones [b]

ABSTRACT

Brazilian cities are typically unequal and car dominated, where poorer communities mainly rely on public transport, walking and cycling. Yet, understanding the experience of using these modes within specific contexts remains limited. In this paper, we illustrate how the 'New Mobilities Paradigm' can contribute to the 'Accessibility Turn' in urban research. Focusing on the low-income 'Cruzeiro-Tronco' neighbourhood in Porto Alegre, Brazil, we incorporate considerations of equity and social inclusion by applying Jensen's 'Staging Mobilities' framework to examine how mobility is 'staged from above' by institutions and 'staged from below' by residents. We used biographical interviews and mobile methods to provide in-depth accounts of the lived experience of walking and cycling, showing how residents navigate the spaces and negotiate their mobility strategies in places deemed accessible by conventional 'objective' metrics. By applying Jensen's framework as part of a mixed-methods research approach, we provide a more informative and context-specific account of the accessibility landscape, constructing knowledge *with participants* about the *meanings of accessibility* to support more inclusive policies and designs.

ARTICLE HISTORY

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KEYWORDS

accessibility, walking and cycling, Porto Alegre/Brazil, staging mobilities, mobile methods

摘要

将无障碍理解为一种生活体验: 以巴西阿雷格里港的步行和骑行为例。 *Area Development and Policy*. 巴西的城市通常是不平等的, 以汽车为主, 较贫穷的社区主要依靠公共交通、步行和骑自行车。然而, 对在特定环境下使用这些模式的体验的理解仍然有限。本文阐述了'新移动范式'如何有助于城市研究中的'可达性转向'。研究重点关注阿雷格里港的一个低收入社区'Cruzeiro Tronco', 目的是通过应用詹森(Jensen)的'分期流动性'研究框架, 结合公平和社会包容的考虑, 研究机构是如何'从上到下'流动的和居民是如何'从下到上'的流动的。通过使用传记访谈和移动方法来深入描述步行和骑行的生活体验。本文展示了居民如何在被传统'客观'指标视为可以到达的地方应用空间和协调其移动策略地。通过将詹森(Jensen)的框架作为混合研究法的一部分, 希望对可达性条件提供更具信息性和特定背景的描述, 与参与者一起构建关于可达性含义的知识, 以支持更具包容性的政策和设计。

关键词

可达性, 步行和骑行, 阿雷格里港/巴西, 分期性流动, 移动方法

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RESUMEN

Entender la accesibilidad como experiencia vivida: El caso de pasear e ir en bicicleta en Puerto Alegre, Brasil. *Area Development and Policy*. En general, las ciudades brasileñas suelen ser desiguales y están dominadas por automóviles, donde las comunidades más pobres dependen del transporte público y se desplazan a pie o en bicicleta. Sin embargo, no se conoce muy bien la experiencia de utilizar estos modos de transporte en contextos específicos. En este artículo destacamos de qué manera puede contribuir el 'Nuevo Paradigma de la Movilidad' al 'Cambio de Accesibilidad' en estudios urbanos. Mediante un análisis exhaustivo de 'Cruzeiro-Tronco', un barrio con bajos ingresos de Puerto Alegre, nuestro objetivo es tener en cuenta los criterios de igualdad e inclusión social utilizando el marco de la 'escenificación de movilidades' de Jensen con el fin de examinar de qué modo las instituciones ponen en escena la movilidad 'desde arriba' y los residentes 'desde abajo'. Utilizamos entrevistas biográficas y métodos de movilidad que nos proporcionan relatos exhaustivos de las experiencias que se tienen al desplazarse caminando o en bicicleta, y mostramos cómo los residentes navegan por los espacios y negocian sus estrategias de movilidad en lugares considerados accesibles según los indicadores métricos 'objetivos' convencionales. Al aplicar el marco de Jensen como parte de un enfoque de investigación con métodos combinados, esperamos ofrecer un relato más informativo y con un contexto específico del paisaje de accesibilidad, construyendo el conocimiento con participantes sobre los significados de la accesibilidad para apoyar políticas y diseños más inclusivos.

PALABRAS CLAVE

accesibilidad, caminar, ir en bicicleta, Puerto Alegre/Brasil, movilidades escenificadas, métodos de movilidad

АННОТАЦИЯ

Понимание доступности как жизненного опыта: пример пеших и велосипедных прогулок в Порту-Алегри, Бразилия. *Area Development and Policy*. Бразильские города, как правило, отличаются неравноправием и преобладанием автомобилей, где более бедные общины в основном полагаются на общественный транспорт, пешие прогулки и езду на велосипеде. Тем не менее, понимание опыта использования этих видов транспорта в конкретных контекстах остается ограниченным. В этой статье мы проиллюстрируем, как 'Новая парадигма мобильности' может способствовать 'повороту к доступности' в городских исследованиях. Сосредоточившись на районе Крузейру-Тронко с низким уровнем дохода в Порту-Алегри, мы стремимся учесть соображения равенства и социальной интеграции, применив концепцию 'Организации мобильности' Дженсена для изучения того, как мобильность 'организуется сверху' учреждениями и 'организуется снизу' жителями. Мы использовали биографические интервью и мобильные методы, чтобы предоставить подробные отчеты о пережитом опыте пеших и велосипедных прогулок, показав, как жители ориентируются в пространстве и согласовывают свои стратегии мобильности в местах, которые считаются доступными по общепринятым 'объективным' показателям. Применяя концепцию Дженсена как часть исследовательского подхода, основанного на смешанных методах, мы надеемся предоставить более информативный и зависящий от контекста отчет о ландшафте доступности, расширяя знания участников о значении доступности для поддержки более инклюзивной политики и проектов.

КЛЮЧЕВЫЕ СЛОВА

доступность, пешие и велосипедные прогулки, Порту-Алегри/Бразилия, организация мобильности, мобильные методы

1. INTRODUCTION

Brazil became a predominantly urban nation in the 1970s, long before the threshold of 50% of the population living in cities was reached globally in 2008. At that time, technocratic approaches to the growth of cities and managing their urban mobility systems were used by a military dictatorship interested in building highways and supporting the automotive industry as a way to foster national economy and to integrate a large and fragmented territory (Vasconcellos, 2018). As a result, Brazil experienced decades of simultaneous explosive urbanisation and rapid motorisation, when cities have become increasingly hostile to walking – progressively limited to commercial areas in dense city centres – and cycling, still regarded as a mere recreational activity rather than a practical mode of transport, with an average estimated 3% modal share (Associação Nacional de Transportes Públicos [ANTP], 2020).

After a 'planning void' that followed the fall of the military regime, policy innovations emerged in the country in line with 'sustainability' discourse that started to dominate the global debate in the late 1980s (World Commission on Environment and Development [WCED], 1987) This included recognition that action was needed to reduce the growing rate of traffic deaths and injuries. The resultant 1997 'National Traffic Bill' prioritised improving the quality of the traffic environment including safety for walking and cycling (Brasil, 2022).

Nevertheless, Brazilian cities continued to struggle in a somewhat disorganised manner against the harmful effects of motorised traffic growth and urban sprawl, until the 2000s, when the full resumption of central government as a formulator of urban policies led to the promulgation of the 'City Statute' in 2001, the creation of the 'Ministry of Cities' in 2003 and the launch of a nationwide wave of plan-making in 2006 (Cymbalista & Santoro, 2009). This unfolded into a series of sectorial policies such as sanitation, housing and, finally, urban mobility, culminating in 2012's 'National Urban Mobility Policy' that shifted the focus from car traffic management to public transport strategies, socio-spatial inclusion, and the integration between transportation and land use. It gave a prominent role to walking and cycling, regarded as cleaner, healthier, fairer and inclusive (Brasil, 2012). Moreover, the concept of 'accessibility' was finally brought centre stage where access to basic services, public spaces, social facilities, jobs and other 'opportunities' were regarded as a fundamental right (Brasil, 2012).

Despite this progress, the bill was not fully instituted, and there is widespread criticism that its implementation has been highly uneven, with very distinct outcomes for different social groups. Of particular concern is how autocentric mobility planning with focus on road capacity improvement still dominates and has contributed to excluding low-income communities from fully accessing urban opportunities (Blanco et al., 2018) and, indeed, has served to increase inequalities (Luz et al., 2022).

Investment in infrastructure for private cars often manifests itself in the form of the opening and widening of 'Avenidas' that provide long-range intra urban connections. This often occurs separately to transit-oriented development (TOD) as in the example of Tronco Avenue in the Cruzeiro neighbourhood in Porto Alegre, the object of this study (Table 1). Locally, such interventions often involve the demolition of a built fabric constructed over decades by low-income residents that forms an accumulated family heritage, a wealth disregarded by city officials in favour of brand-new corporate housing schemes (Loukaitou-Sideris et al., 2023). This can be seen as a process of gentrification, as the road-building increases land value and forces the eviction of original residents in exchange for middle- and high-income families and the building of commercial developments such as office buildings

Table 1. Avenida Tronco stalled construction works.

In 2010, when the mobilisation to host the 2014 World Cup began in Brazil, politicians at Porto Alegre City Hall (Prefeitura Municipal) voted in favour of road-widening and the construction of a large roundabout at Avenida Tronco, one of the main thoroughfares in the Cruzeiro Region that connects the city centre to the football stadium, shopping centres and new high-rise/high-income developments (Figure 5). One of the implications of this scheme was the reported removal of 1600 families who received compensation in the form of relocation to public housing schemes or 'housing vouchers' to buy homes elsewhere. The roadworks began in 2012 by demolishing all adjacent rows of houses bordering the Avenida, then progressed very slowly to 2016 when stopped completely, leaving construction debris and obstacles (Figure 4). With stop–start construction, the last of the houses due for demolition was only completed in 2022 and construction of road infrastructure started again with planned completion in 2023.

that benefit from high centrality and easy access by car (Furtado, 2014; Gaffney, 2016; Ivester, 2017; Lopes de Souza, 2016).

Widening of roads also cause 'community severance', a phenomenon that has been extensively studied (Anciaes et al., 2016; Lara & Rodrigues da Silva, 2019; Mindell & Anciaes, 2020). As we will explore in section 4, this often occurs not only as the final outcome of such urban renewal processes but also during the very construction period, due to the delay and inadequacy of temporary accessibility schemes implemented.

Expanded car infrastructure breaks community ties by separating people living at different sides of the roads, and can also hinder access to city amenities, services and opportunities (da Silva Júnior & Ferreira, 2008). It can also transform community life that relies on the intensive use of street space by families (Silveira et al., 2020).

There has been also a concern in Brazil that the policies for stimulating manufacture and sale of automobiles and motorcycles – a governmental response to the 2008 global economic crisis – have mainly served the motorised upper and middle classes, neglecting the needs of low-income groups who mainly rely on walking, cycling and local buses (Andreoli et al., 2020). In 2013, this tension led to widespread protests against the raising of bus fares and in support of the right to affordable or even free, public urban transport (Verlinghieri & Venturini, 2018).

All this has contributed to the current urban mobility crisis, a phenomenon reinforced by the emergence of ride-hailing schemes that helped to undermine local public transport systems, especially in the Global South (Shaheen & Cohen, 2021). Faced with this dilemma, the Brazilian government is now being forced to re-evaluate the role of public transport and to start considering effective investment in infrastructure for walking and cycling.

To investigate the challenges of mobility in such a context, this paper focuses on the 'situated mobilities' of residents in the Great Cruzeiro region in Porto Alegre, a low-income neighbourhood close to the city centre whose historical lack of decent infrastructure and poor accessibility has been exacerbated in recent years by the initiation and subsequent abandonment of the roadworks intended to give access to the city's 2014 World Cup football stadium and to new high-cost residential developments.

By carefully examining diverse experiences of movement during people's daily lives, and the strategies they use to overcome mobility difficulties, our approach provides a rich understanding of residents' everyday experience of (in)accessibility in a neighbourhood which has felt the impacts of autocentric policymaking and practice through a major road-widening project. This encompasses how urban and transport planning, land use and governance play out on the ground and impact peoples' lives, and how this understanding could inform better

approaches to transport planning and urban design and help shape wider policies that could better support and promote walking and cycling. This approach complements more traditional, purely quantitative approaches to transport planning that measure and model accessibility with less understanding of the lived experience of accessibility *in situ*. The contribution provides a deeper understanding of why people behave in the way that they do, highlighting any differences in the meanings of, motivations for, and feelings about such behaviours and how these vary between individuals in a particular social and cultural context. There is also a change of focus on accessibility from simply achieving movement from origins to destinations to understanding the situational experience of the routes between. Qualitative data, in the form of personal testimonies captured by audio and video taken while on the move, can also complement the 'brute facts' of travel, typically captured in quantitative studies *of* participants through travel surveys, diaries and Global Positioning System (GPS) tracking, and help generate knowledge *with* communities and provide a richer understanding of travel behaviour among those responsible for devising sustainable transport policy and projects.

The structure of this paper is as follows. Section 2 briefly reviews how accessibility has traditionally been conceptualised as a matter of 'efficiency' and only recently developed to take into consideration issues of equity and social inclusion. We end the section highlighting the 'Mobilities Turn' and the potential of Jensen's 'Staging Mobilities' framework to provide deeper understanding of how mobility is 'staged from above' by institutions and 'staged from below' through everyday mobility practices (Jensen, 2013). Section 3 describes our mixed-methods approach, which also incorporated Jensen's framework as a lens through which to investigate the cultural, social and material conditions under which walking and cycling are performed and how this conditions their practice. Jensen's framework guided our methodology that includes in-depth qualitative 'mobile methods' with residents in our case study neighbourhood. Section 4 presents our findings and briefly outlines the institutional and physical setting in which walking and cycling are 'staged from above' through policies and their material repercussions. Section 5 then turns to the main contribution of the paper, how mobility on foot and by cycle in the neighbourhood is perceived using data from our quantitative survey, and then how it is choreographed and 'staged from below' by people going about their everyday activity from our qualitative methods. Section 6 discusses the benefits of our mixed-methods approach and how a situated approach can reveal how accessibility is conditioned by cultural and social as well as material infrastructures. Section 7 concludes by highlighting the contribution of our approach to understanding accessibility, and its utility in combination with more traditional approaches, and provide a final reflection on the challenges and limitations.

2. LITERATURE REVIEW

Traditional conceptualisation of accessibility in urban and transport planning dates to the 1950s, when automobile dependence firmly established itself in the Western world, especially in the USA. It was defined in pioneering works as a measure of the spatial distribution of activities from a point (Hansen, 1959; Ingram, 1971) also relating to a conventional concept of mobility – the movement of people and goods between origins and destinations – that consider land use, location of destinations, the quality of available transport alternatives and other factors (Levinson & King, 2020). This 'classic' approach states in a somewhat simplistic manner that while mobility is a property of individuals, accessibility is a spatial property of places (Pereira & Herszenhut, 2022).

During the latter half of the 20th century, studies of accessibility focused on efficiency relying on four main families of quantitative measures: infrastructure based, examining the physical transport network; location based, assessing accessibility between specific origins and

destinations; individual based, considering personal reach within a specified time interval; and utility based, evaluating the economic benefits derived from spatial opportunities. These contributed to a strong quantitative tradition in the field, providing insights into transportation, activity distribution, personal accessibility and economic advantages at aggregated scales (Geurs & Van Wee, 2004; Neutens et al., 2010). This traditional conceptualisation has generally guided accessibility planning in Brazil (Vasconcellos, 2018).

More recent studies started considering access in relation to 'equity' and the opportunities that different areas and social groups are provided to access different activities (Guimarães & Lucas, 2019; Pereira et al., 2017). According to Guimarães and Lucas (2019), contemporary transport policymaking should require consideration of equity in aspects such as the design of systems, the definition of investment priorities and the allocation of resources. This also involves consideration of how 'transport-related resources' are (un)equally distributed, since owning an automobile or living close to bus stops, for example, may not be sufficient for people to reach desired places and opportunities (Pereira et al., 2017). Guimarães and Lucas (2019), Pereira et al. (2017) and Verlinghieri and Schwanen (2020) have also pointed out how studies on the distribution of accessibility to essential activities between different regions and social strata have proliferated in recent decades and contributed to identifying relationships between social inequality and disabilities related to transport.

Contemporary studies focused on Brazil include Slovic et al. (2019) investigating access to jobs by public transport in São Paulo and demonstrating how low accessibility levels are associated with places with worse socio-economic status, lower life expectancy and precarious infrastructure. Meanwhile, Bittencourt et al. (2020) compared access with workplaces in four Brazilian capital cities and found greater accessibility among white/higher income groups compared with black/lower income groups, and that there is greater inequality in larger cities compared with smaller ones. de Oliveira et al. (2021) conducted an evaluation of access to employment opportunities in Belo Horizonte using theories of social justice and spatial analysis to demonstrate the unequal distribution of accessibility and mobility.

Nevertheless, there is a dearth of studies on accessibility and equity specifically in relation to walking and cycling in Brazilian cities and those that do exist still have tended to follow the quantitative tradition. For example, research on walking in Porto Alegre has included quantitative studies on the link between the built environment and attitudes and barriers to walking (Larrañaga et al., 2016, 2019) and the relationship between built environment and walking choices (Vargas et al., 2022). Pritchard et al. (2019) modelled the potential of cycling, in combination with public transit, to address inequalities in job accessibility in São Paulo. Tucker and Manaugh (2018) analysed the equitability of access to bicycle lane networks in Curitiba and Rio de Janeiro, while Duran et al. (2018) also used mapping to explore the inequalities of bicycle sharing systems in several Brazilian cities.

Qualitative approaches to investigating walking or cycling in Brazil are less common. Jones & Novo de Azevedo (2013) conducted exploratory research to understand discourses on the perceived role of cycling in the future development of a Brazilian city (Pelotas, Rio Grande do Sul) using focus groups, interviews and observations. Maia et al. (2016) used focus groups and cognitive mapping to understand the relationship between the general mobility behaviours of people living in low-income locations in Recife, their ability to engage in everyday activities and their perceptions of how their livelihoods and access opportunities in the wider city were related to the local transport system. Similarly, Guimarães et al. (2019) have investigated access to healthcare by people in low-income communities in Sao Paulo using focus groups.

Studies in South America that have adopted a qualitative approach to investigation include Martínez et al. (2019) on the meanings behind attributes of the built environment when walking in deprived neighbourhoods in Santiago de Chile, while in the same city, Jiron (2010, 2011, 2020, 2020) used ethnographic approaches to explore 'everyday practices' of mobility,

often focusing on the mobility of women. These studies examine how transport-related decisions – including walking and cycling choices – reflect and impact family arrangements, lifestyles and socio-cultural traditions to address urban inequalities from a critical perspective (Jiron & Gómez, 2018; Jones & Novo de Azevedo, 2013).

More recent studies have placed an emphasis on methodologies that seek to capture real-life situations and include, for example, interviewing methods that elicit people's perceptions while walking or cycling (e.g. de Arruda et al., 2021; Jirón et al., 2020; Montoya-Robledo et al., 2020). Many focus on assessing 'personal safety' issues. For example, Capasso da Silva and Rodrigues da Silva (2020) studied how safety aspects – crime perception and true violence occurrences – influence mode choice on trips to a university campus in Brasilia, while Arellana et al. (2020) suggest that subjective personal security and traffic safety are the greatest factors influencing walkability in medium-size cities in Brazil.

Despite these and other recent advances in mixed-methods research in Latin America, accessibility studies still follow an 'intermediary' approach, deploying, on the one hand, quantitative methods that, even when aiming to address contemporary issues such as accessibility inequalities and to criticise autocentric planning, are mainly based on secondary data and desktop spatial analyses. On the other hand, studies regarded as qualitative still rely on 'utility' concepts and methods traditionally employed in consumer research to assess transport decisions, such as stated preference experiments and choice modelling (Arellana et al., 2020; Falavigna & Hernandez, 2016; Ferrari et al., 2020; Guzman et al., 2023; Ruiz-Padillo et al., 2018; Trichês Lucchesi et al., 2020).

Qualitative research on the lived experience of walking and cycling in Brazil and South America, therefore, is still in its infancy. This prompts calls for further research in order to understand people's needs and abilities and to make access by these modes more equitable, particularly given they are the main modes used by low-income groups (Vecchio et al., 2020).

2.1. The new mobilities paradigm

The 'New Mobilities Paradigm' (Sheller & Urry, 2006) provides the possibility of further consolidating the 'accessibility turn' in urban research. This is because it broadens conceptions of accessibility and expands the possible approaches to investigation and therefore understanding of the *social and cultural context* within which mobilities (including walking and cycling) takes place. The central premise is that movement is an integral part of how a place is defined and experienced and is more than simply movement between points. In essence, mobility is inscribed with *meaning* by those who interpret and make sense of it and is constructed through different contexts and positions (Cresswell, 2006).

Adding the dimension of design and physical form of the built environment to this framing, Jensen (2013) has brought a sociological analysis of mobility closer to the disciplines of urban design, civil engineering and architecture. Jensen's 'staging mobilities' framework (Jensen, 2013) directs the focus towards the way infrastructures, technologies and networks are designed, laid out and built, and how this relates to the social realm in terms of the meaning of movement to social and cultural practices. This allows the contemporary city to be understood as an assemblage of circulating people, goods, information, signs, and relational networks that create individual and collective experience while choreographing mobile bodies.

2.2. Staging mobilities

The Staging Mobilities framework posits that mobilities are always being staged and acts as a framework to analyse how (and by who and why) staging takes place as it does ('staging from above' by planning, design, regulations and institutions) and how those who are staged perceive and react to their staging ('staging from' below by consociates in interaction and individual performances of mobile self-preservation). By focusing on three dimensions for any

Figure 1. Jensen's staging mobilities framework.
Source: Jensen (2013, p. 6). Reproduced with permission from the publisher, Routledge.

real-life mobile situations – physical settings and material spaces; social interactions; and embodied performances – the approach enables investigation of individual experiences and collective processes of inclusion and exclusion in the transport system (Figure 1). Particular attention focuses on how people 'stage mobility from below' through negotiating infrastructure and the strategies they use, and the affective and emotional dimensions in terms of how they feel. Jensen also appeals for 'critical mobility thinking' in the application of his framework to attend to the social repercussions that different mobility arrangements and designs may have in terms of social inclusion and exclusion (Jensen, 2009).

Use of Jensen's staging framework is in its infancy and has been applied to cases in the Global North. Examples of its application include, Den Hoed (2018) using it more narrowly in relation to: older people's cycling in the Netherlands and the UK through biographical interviews and mobile methods; Murray and Cortés-Morales (2019) on the role of institutions in the staging of children's mobilities in the UK; Paananen and Minoia (2019) used mobile methods and geographical information system (GIS) data to understand the experience of international cruise passengers visiting Helsinki, Finland; and Dahl Wikstrøm and Böcker (2020) who combined mobile methods, GIS, photo- and map-elicitation in interviews with participant observations to understand the introduction of electric bikes (e-bikes) to suburban commuters in Oslo, Norway.den Hoed 2018 and Dahl Wikstrøm and Böcker (2020, pp. 296–297) found that combining qualitative methods with the Staging Mobilities framework provided an effective means of breaking down the previous disciplinary silos of health, ageing and transport studies and provided a more holistic understanding of ageing and mobility in context. Similarly Murray and Cortés-Morales (2019) emphasise how the framework can highlight the 'interdependencies of social interaction, materials and communications' of children's mobilities. Paananen and Minoia (2019) reflect on how the framework effectively brought together qualitative and locational data to better understand both the enabling and disabling aspects of tourism mobility. They emphasise the advantages of mixed methods and how the data can be situated in the framework but the time-intensive nature of qualitative methods is also noted (Paananen & Minoia, 2019). Dahl Wikstrøm and Böcker (2020) do not reflect on the success of their application of the framework but use it effectively to structure their analysis.

So, while the Staging Mobilities framework has been used effectively as a theoretical model with mixed-methods data, it has not yet, to our knowledge, been applied to walking and cycling in the Global South or a general resident adult population.

3. APPROACH AND METHODS

The data we report here for our Porto Alegre case are drawn from a larger study that focused on mobility, health and well-being across three cities in Brazil: Brasília (Federal District), Florianópolis (State of Santa Catarina) and Porto Alegre (State of Rio Grande do Sul). In each of these three cities, we selected low- and middle-income neighbourhoods based on their different spatial and demographic characteristics and the challenges they were facing in relation to promoting healthy urban mobility (Jones et al., 2019).

In Porto Alegre the low-income target was the Greater Cruzeiro region, from which we selected a neighbourhood known as Cruzeiro-Tronco (see section 4). After the listing of all residential addresses recorded inside the neighbourhood boundaries (Figure 2) by the CNEFE – National Registry of Addresses for Statistical Purposes (Brasil, IBGE 2012) – we established a 95% level of confidence and a ±5% confidence interval to arrive at an approximately 800 households sample size, randomly selected from the list.

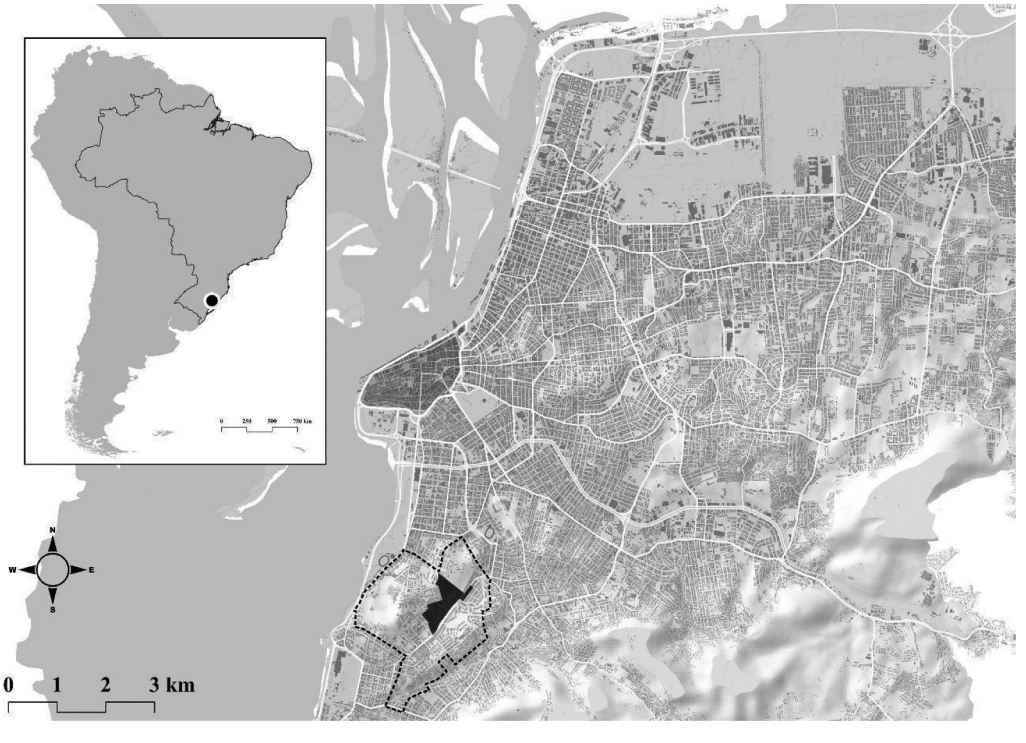

Figure 2. Location of the city of Porto Alegre in Brazil/South America and location of the Cruzeiro-Tronco neighbourhood (black fill) inside the Greater Cruzeiro region (dotted outline) in Porto Alegre, with highlighted city centre (dark grey).

Source: Authors' own.

Methods included a social survey applied to a single resident aged 18+ at each household to obtain data on neighbourhood perception; personal travel behaviour; quality of life; physical activity; health and life habits. Part of the survey included the Neighbourhood Environment Walkability Scale (NEWS; Cerin et al., 2006) to assess perceptions of environmental attributes of the neighbourhood and accessibility for walking and cycling.

To understand the experience of mobility of those residents that have declared walking and cycling as their preferred modes of transportation we applied in-depth qualitative investigation using 'mobile methods'. A subsample of 12 individuals was drawn from those surveyed who agreed to participate in the second stage of the research. The sample aimed to balance gender and age profiles and walking and cycling as predominant methods of travel.

Mobile methods move beyond conventional 'stationary methods' of social science towards a more situated understanding of mobility through observation of, and enactment in, everyday mobility spaces (Boas et al., 2020; Buscher & Urry, 2009; Buscher et al., 2010; Fincham et al., 2009). For our study, this involved a researcher accompanying the participant (and videoing them using a bodycam) while they made a regular journey of their choice either on foot or by cycle as part of a 'go-along' interview (Carpiano, 2009; Kusenbach, 2003) and using Jensen's Staging Mobilities framework (Jensen, 2013), first as a basis for the discussion topics, and second to analyse the significance of those *interactions* and participant's *embodied emotions*. The discussion topics included route choice, decisions made during the journey, experience of social interactions and those with physical infrastructure and changes in feelings. Capturing the journey on video while on the move was particularly important for the cycle go-alongs due to the inherent difficulty of interviewing people side by side while sharing the road vis-à-vis talking and walking on the footway or while seated on a bus (Brown & Lackova, 2020).

Before the go-alongs, biographical interviews were conducted with participants. This enabled researchers to develop an understanding of the participants' cycling and walking trajectory over their life course and set within the context of their household, employment, relationships and current mobility practice (Chatterjee et al., 2012; Schoenduwe et al., 2015). It also allowed researchers to build rapport with participants before going on a journey together.

All fieldwork was conducted between November 2017 and June 2018 by a team of five Brazilian researchers living in Porto Alegre (Jones et al., 2019). Biographical and go-along interview material was validated with participants. Analysis involved complete immersion in the data by the researchers and co-authors shortly after field data collection. Thematic analysis using constant comparison between interviewees' accounts of their mobility enabled points of convergence and divergence to be identified (Braun & Clarke, 2006). Thematic analysis was aided by using NVivo version 12 (QSR International, 2018). The study was approved by Brazilian Ethics Committee (see Ethical statement below) and all participants gave their written consent to the interview and for the use of anonymised quotations and visual material generated during the fieldwork.

4. THE SETTING: STAGING MOBILITY IN PORTO ALEGRE

In this section, we first describe how mobility is 'staged from above' within the context of Porto Alegre and, more specifically, our case site, the Cruzeiro-Tronco neighbourhood by 'planning, design, regulations and institutions' in the city that have shaped the 'physical settings, material spaces and design'. We do this by briefly explaining the *institutional setting* before describing the *physical setting*. Section 5 turns our attention to 'staging from below' in that neighbourhood.

4.1. Institutional setting

Porto Alegre (population of 1.49 million) is the capital city of the State of Rio Grande do Sul, being regarded as providing one of the highest standards of living in the country – the third best among 23 Brazilian capital cities in terms of income and longevity (Brasil, IBGE 2012) – and is also renowned for its progressive and democratic tradition, hosting the first World Social Fori that started to challenging globalisation and neoliberal agenda in the beginning of the 2000s (Teivainen, 2002). It was also the first city to pioneer a 'participatory budget' and the inclusion of residents in the public expenditure decision-making process (Bruce, 2004; Fedozzi & Martins, 2015).

Following nationwide trends, the number of motorised vehicles in the State of Rio Grande do Sul grew 45.2% from 2012 to 2022, while the number of inhabitants grew only 6.83% (Rio Grande do Sul, 2022). The numbers for Porto Alegre are similar and reflect the mode share in the city: approximately 30% public transport, 20% walking, 50% private car and 0.5% cycling, based on our estimates extrapolated from the last transport survey held in 2003 (Porto Alegre, 2004). The average travel time from home to work was approximately 34 min in 2010, while approximately 8% of the workforce spends more than 1 hour per day travelling from home to work (Pereira & Schwanen, 2013).

The city was a pioneer in policies for cycling, starting in 1995 by building cycle lanes to connect parks and recreation areas and culminating in the 2009 Bicycle Master Plan that promised to develop approximately 495 km of protected bicycles lanes and to establish a new culture of sharing traffic space (Porto Alegre, 2009). However, more than 10 years later, fewer than 48 km had been built by the mainly right-wing mayors who took office over that period. Their pro-market economic approach tries to encourage cycling by the implementation of a bikeshare system sponsored by a local bank, offering approximately 500 cycles in 41 stations across the city (Porto Alegre, 2022) and to stimulate other commercial start-up companies to populate the wealthier parts of the city with dockless bikes and e-scooters for hire.

Regarding walking, the city launched in 2011 its Accessibility Master Plan, but it deals exclusively with standards for the universal design and signalling of pavements, entrance to buildings, ramps, crossings, etc., without considering broader concepts of 'access to the city' (Porto Alegre, 2011). More recently, the Pedestrian Statute of 2014 establishes rights of pedestrians, duties of drivers and assigns the municipality with responsibility for providing safety for pedestrians, particularly for people with disabilities (Porto Alegre, 2014). However, again, there is little evidence of providing for accessibility in a broader sense, such as establishing routes between residential areas and employment centres or creating walkable/cyclable neighbourhoods.

A proposal to consolidate the aforementioned regulations into a Porto Alegre Mobility Plan (MobiliPOA) has been in place since 2018, but at the time of writing was not fully completed (Porto Alegre, 2022).

4.2. Physical setting, material spaces and design

The Greater Cruzeiro region – from which we studied the Cruzeiro-Tronco neighbourhood – is home to 65,408 inhabitants (around 4% of the total population of Porto Alegre) housed within approximately 6.8 km^2, 1.4% of the city's area (Brasil, 2012). The region is described by the Brazilian Census as a set of 'subnormal agglomerates', where the average per capita income is estimated to be three time less than the average for the city (Brasil, 2012). Cruzeiro is also known for its high rates of criminality, especially because of the drug dealers. Police data show there were 19 homicides in 2018 in Cruzeiro, 3% of the total 510 spread across the city's 94 neighbourhoods (Cidade de Porto Alegre, n.d.).

Figure 3. Cruzeiro-Tronco zoomed satellite image.
Source: Google Earth, Image © 2023 Maxar Technologies, Image © 2023 Airbus.

Figure 4. Tronco Avenue roadworks next to the roundabout, November 2017.
Source: Authors' own.

Despite being located close to the city centre – approximately 3 km (Figure 2) – the neighbourhood is an 'enclave' embedded in the formal city but poorly connected to it. The site is conformed by a deep valley with very sloping hillsides, on the bottom of which there lays a main road – the Avenida Tronco. It resembles a patchwork of densely built housing estates – the so-called Vilas – that have, potentially, a high degree of connectivity for walking due to the small blocks (Figure 3). But, in practice, the network is highly fragmented and full of dead ends, with few direct routes between the Vilas.

The diversity of land use is low, commerce is mainly composed of small shops without the presence of supermarket chains that dominate the city. There is a large public facility located near the Tronco Avenue roundabout (Table 1) that provides a significant portion of the local healthcare services, supplemented by three small health units scattered

Figure 5. Tronco Avenue roundabout, August 2023.
Source: RBS – Zero Hora Editora Jornalística S.A., 2023.

throughout the region. Recreational areas are scarce and poorly maintained, often becoming hubs for drug dealing.

Public transportation consists of buses that are mainly routed along Tronco Avenue, almost exclusively connecting the region to the city centre and making journeys to other neighbourhoods long and time-consuming. Taxi and ride-hailing services tend to avoid the area at night.

Travel survey data highlights the low mobility of inhabitants with 1.2 trips on average on working days; fewer than 7% of weekly trips made for recreation/leisure purposes; approximately 2% of the trips made by bike and 42% on foot (Jones et al., 2019), much bigger figures than the city's.

There are serious deficiencies in infrastructure for moving around, especially in pavements, street drainage and public lighting, exacerbated by the abandoned Avenida Tronco 2014 World Cup infrastructure project (Table 1).

5. FINDINGS: STAGING FROM BELOW

In this section, revealing staging from below, we first provide an insight into residents' perceptions of their 'physical settings, material spaces and design' through social survey; second, we expand on this through in-depth investigation with 12 residents about their walking and cycling experience in the neighbourhood using biographic interviews and mobile methods to focus in on 'social interactions' and 'embodied performances' in order to reveal 'staging from below' by consociates in interactions and individual performances of mobile self-preservation (Jensen, 2013, p. 7).

5.1. Social survey

A total of 717 residents aged 18 or over responded to our survey (90% response from the 800 targeted population). They were asked to record their general travel behaviour and their perception and satisfaction with their neighbourhood in relation to access, walking and cycling, safety from traffic and crime. Compared with the demographic of Porto Alegre city, the sample was skewed towards women (69% versus 52%), non-white (50% versus 20%) and lower income – R$1524 versus R$2480 per month (Brasil, 2012). Around 40% of all journeys during a typical week were reported as being on foot, 34% by car,[1] 22% by public transport and around 2% by cycle. This is broadly equivalent to

figures for the overall Porto Alegre urban area in 2003, as well as the fact that men were much more likely to drive compared with women (39% versus 13%).

Analysis of survey responses on the NEWS items (Table 2) demonstrated that, in terms of *access to services*, most residents perceived that there were shops and places to go within easy walking distance of their homes (items A–C) and they were satisfied with this level of access (item L). However, while almost two-thirds (63%) perceived that there were pavements on most streets, more than half (59%) did not think that these were well maintained (items D and E). Despite this, 71% were satisfied with ease of *walking* (item N) and around 60% thought it was pleasant to do so (item O).

In contrast, for *cycling*, there was an overwhelming perception (93%) that there were *not* cycle lanes on most streets in the neighbourhood (item F) and three-quarters (74%) perceived that those that did exist were *not* well cared for (item G). Nearly two-thirds (59%) were unsatisfied with ease of cycling (item P) and only one-third (33%) indicated that it was pleasant to cycle in the neighbourhood (item Q).

Residents were divided (36%/50%) on their satisfaction with the *amount of traffic* in the neighbourhood (item R) and the perceived impact this had on *ease and pleasantness* of walking (48%/52%, item H) although one half (50%) were unsatisfied with the *speed of traffic* in their area (item S).

Residents perceived there is a high crime rate in the neighbourhood (89%) and that this made it unsafe to go out during the day (62%) and particularly at night (86%) (items I–K) while four-fifths (78%) were unsatisfied with safety from crime (item T). Despite this, over half (55%) of all respondents felt that Cruzeiro was *a good place to raise children* (item U) and two-thirds (66%) thought it was *a good place to live* (item V).

5.2. Biographical and go-along interviews

Our participant set included six people who identified as women and 6 who identified as men, aged between 20 and 57 years (Table 3). Six had access to a driving licence. Four participants performed a journey by cycle (one of which was combined with a bus trip) and eight performed a journey on foot (two combined with a bus trip). The journeys were mainly functional including work and study and started from participants' homes or workplaces. Six journeys were confined to the local neighbourhood and the other six extended beyond the neighbourhood to other areas within the city and metro region. The shortest journey lasted 5 min and the longest 74 min.

5.2.1. Interactions

Our participants reported several challenges when walking inside Greater Cruzeiro. The walking environment was generally regarded as highly variable in quality with some very poor-quality pavements typified by uneven and broken surfaces, holes and overhanging vegetation. We observed lamp posts and (often redundant) payphones located in the centre of pavements as well as an abundance of litter and debris strewn across the ground. Navigating these obstacles was a factor in some of our participant's route choices. Informal footpaths were used as shortcuts, some through rubbish strewn areas that were reportedly infested with rats or frequented by drug users Figure 6. Miriam (female, age 32) explained that the pavements were of poor quality because their maintenance was the responsibility of the householder:

Table 2. Residents' perceptions of local accessibility and overall neighbourhood satisfaction.

		% (*n* = 717)				
Item		**SD**	**D**		**A**	**SA**
	Access to services					
A	I can do most of my shopping at local stores	12	10	–	29	49
B	Shops are within easy walking distance of my home	26	13	–	30	31
C	There are lots of places to go within easy walking distance of my home	10	5	–	21	65
	Places to walk and cycle					
D	There are sidewalks on most of the streets in my neighbourhood	26	11	–	26	37
E	The sidewalks in my neighbourhood are well maintained	45	14	–	30	12
F	There are cycle lanes on most streets in my neighbourhood	90	3	–	4	2
G	The cycle lanes in my neighbourhood are well cared for	69	5	–	17	9
	Safety from traffic					
H	There is so much traffic on my street that it makes it difficult or unpleasant to walk in my neighbourhood	29	19	–	13	38
	Safety from crime					
I	There is a high crime rate in my neighbourhood	4	7	–	22	67
J	The crime rate in my neighbourhood makes it unsafe to go on walks during the day	25	12	–	27	35
K	The crime rate in my neighbourhood makes it unsafe to go on walks during the night	12	4	–	13	71
	Neighbourhood satisfaction	**TU**	**U**	**N**	**S**	**TS**
L	Access to shopping	5	6	4	26	59
M	Access to public transport	21	14	8	23	34
N	Ease of walking	10	13	5	21	50
O	Pleasantness of walking	19	15	7	25	35
P	Ease of cycling	42	17	8	11	21
Q	Pleasantness of cycling	40	15	12	11	22
R	Amount of traffic	18	18	14	20	30
S	Speed of traffic	27	23	13	14	24
T	Safety from threat of crime	61	17	5	6	11
U	Neighbourhood is a good place to raise children	23	15	7	28	27
V	Neighbourhood is a good place to live	13	14	7	29	37

Note: SD, strongly disagree; D, disagree; A, agree; SA, strongly agree. There is no neutral category. TU, totally unsatisfied; U, unsatisfied; N, neither unsatisfied nor satisfied; S, satisfied; TS, totally satisfied.
Margin of error ≤ ±5% at a 95% confidence level.

Table 3. Participant characteristics.

Pseudonym	Gender and age (years)	Economic status	Driving licence?	Go-along	Details
Alan	Male, 35	PartTime work	Yes	Walk (and bus)	Regular commute from home to work outside the neighbourhood (approximately 0.3 + 4.7 km)
Bruna	Female, 29	Unemployed	No	Cycle	Circular route from home to nearby public square (approximately 1.9 km)
Gabriel	Male, 20	Unemployed	No	Cycle	Regular commute from home to school outside the neighbourhood (approximately 4 km)
Joana	Female, 53	Unemployed	No	Walk	Regular commute from home to her granddaughter's school (approximately 1.3 km)
Lorena	Female, 57	FullTime work	No	Walk	Regular commute from work outside the neighbourhood to her home (approximately 1.6 km)
Marcos	Male, 53	FullTime work	Yes	Walk	Regular walk as part of his work as a health agent (approximately 0.3 km)
Miriam	Female, 32	FullTime work	No	Walk	Regular commute from home to bus station (approximately 1.7 km)
Mogli	Male, 22	PartTime work	Yes	Cycle (and bus)	Regular commute from home to the nearby neighbourhood to take a metropolitan bus to the university (3.5 + 23.7 km)
Raquel	Female, 42	FullTime work	No	Walk	Regular commute from work to home (approximately 3.4 km)
Roger	Male, 24	PartTime work	Yes	Walk	Regular journey from home to the gym (approximately 1.6 km)
Silvana	Female, 41	PartTime work	Yes	Walk (and bus)	Regular commute from home to work outside the neighbourhood (approximately 1 + 10.5 km)
Pedro	Male, 23	PartTime work	Yes	Cycle	Biographical interview only – go-along not performed due to bicycle theft

> [Walking on the sidewalk is] awful, so you take a walk on a street full of holes, because the sidewalk is the resident's responsibility, so you take three or four good ones, but another with a dirt road, holes and grass, not comfortable at all.

Figure 6. Miriam's go-along.
Source: Authors' own, 2018.

Marcos (male, age 53) during his walking go-along highlighted the injuries he had incurred when walking and the challenges for people with restricted mobility:

> I have two colleagues, one has a knee twist because of a sidewalk in the street … if you are going to help some wheelchair patient you do not have accessibility. … I already twisted my foot sliding on the sidewalk that does not exist, happens a lot.

While respondents commonly cited the poor maintenance as being an issue, the absence of pavements within the neighbourhood appeared to be accepted as 'normal'. Along unsurfaced side-streets where vehicle traffic was less common, we witnessed participants walking in the middle of the street rather than using the pavement. Where roads were surfaced with asphalt and traffic levels typically higher, participants were generally 'forced' to use the pavements because of their fear of road danger. Raquel (female, age 42) explained how she often chose to walk in the highway even when it was busy with cars:

> There's a point out there where the sidewalk is not good, there are more people walking and I have to walk in the middle of the street. In a point like this, with the cars coming, it's kind of dangerous, it requires a little more attention.

Journeys on foot could be made even more problematic after periods of heavy rainfall. Despite being a car free walking route, unfinished groundworks along the main Tronco Avenue (Table 1) had created problems with flooding. Joana (female, age 53) explained how these conditions had become more prevalent:

> When it rains, it clogs all the manholes, and we are the ones who suffer. All the courtyards flood. Of all the years we've lived here, it has never flooded before, but lately. … Just yesterday, with that 'drizzle', everything was already full of water.

Participants emphasised their lack of mobility choices in some areas of the neighbourhood that meant they had no alternative but to walk. For example, our oldest participant, Lorena

(female, age 57), highlighted the lack of public transport for her journey: 'I come here on foot because there's no way for me to come and go, not because I want to, because there's no bus available.' Sometimes, when tired or when the temperature was high, she made use of a private collective taxi,[2] but found it expensive. Meanwhile, Raquel often walked longer distances due to financial issues: 'I'll have to do it now until the 30th, because I've spent all my TRI [transit pass] and I'm out of money, so I'm forced to come on foot.'

Car-oriented planning and its impact were evident in Greater Cruzeiro. Cars were typically parked up blocking pavements making access to residences difficult. A private university located in the neighbourhood had installed pedestrian barriers on the corners of some side roads forcing pedestrians to walk on the highway. During her go-along on foot, Raquel commented on the inconvenience of the barriers:

> Because of that thing there [the barriers] … I don't know what the reason for that is … I would have to walk all the way over there to cross, I think it is easier to cross here, outside [on the street].

However, busier routes were often seen as 'safer', particularly for female participants, including Raquel. She explained that she chose to walk along busier routes due to personal safety fears: 'I go where I know there are more people and cars flow … [although] … sometimes, on the crosswalk and I have almost been run over several times.' Meanwhile, Lorena explained how she walked in the middle of the road when the streets were empty for fear of being accosted: 'If they come to get you, the tendency is for you to be scared, and if you go to the middle of the street the car will have to stop.'

Cyclists did not seem particularly uncomfortable with the absence of cycle paths on side roads in more informal parts of the neighbourhood where roads were often unsealed. However, they expressed dissatisfaction with the lack of supportive infrastructure for cycling along asphalted main roads. Pedro (male, aged 23), who would generally cycle whenever he could (apart from when it was raining due to flooding), felt that the neighbourhood was more challenging to cycle in than the city: 'The road is bad, but the respect issue [of how drivers interact with cyclists] is pretty much the same. It doesn't change, but it's worse here than in the city. It's pretty bad to ride here.' Gabriel, our youngest participant, (male, aged 20) rode fast and confidently and considered the areas inside his neighbourhood the worst part of his journey, especially after the World Cup construction that meant drivers were finding alternative routes through the neighbourhood:

> Access is not easy and now [and] with these constructions for the World Cup, it got worse, because [traffic] it's on the other street, and that one doesn't support so many cars, ending up terribly, with horrible access. It just got worse.

Bruna (female, aged 29) regarded herself as a very experienced cyclist but bemoaned the lack of infrastructure including stop signs at junctions to prevent cars from over-running junctions. She also pointed out the dangers of the accumulation of sand and grit on road surfaces which make skidding and falling off her bike more likely. Although she did cycle on the highway, she would mainly use the pavement when cycling with her daughters for safety. Pedro was also reluctant to cycle on the highway, stating, 'I always look for the cycle path in the maps so I can ride there. When I don't find them, I go to the sidewalks.' Mogli (male, aged 22) stated how he preferred to make a detour up a steep hill rather than using the main flatter route through Tronco Avenue because of perceived danger.

Despite these challenges, our participants regarded cycling as a cheaper option that allowed them to save on public transport fares while providing a healthier mode of mobility. Indeed, bus services were criticised for being increasingly expensive, crowded, and unreliable.

Participants explained how difficult and time consuming it could be to use the bus system and of their fear waiting at bus stops. Pedro, who had a part time job that required him to move around the city at different times of the day, chose to ride a bicycle because he thought he could no longer rely on public transportation time schedules. Alan (male, aged 35) stated during his biographical interview, that he cycled, 'to save with tickets and as a sort of sport and health promoter'. However, he also emphasised how he was increasingly deterred from using his cycle, 'because nobody respects it [bicycles] and many streets don't have bike lanes' and highlighted the paradox, 'if you take to the road, the cars complain, if you take to the sidewalk, pedestrians complain!'

5.2.2. Embodied performances

A dominant theme was fear of crime and of personal safety both within and outside the neighbourhood. For some participants, there was a paradox of feeling the need to exercise through walking for personal health and fears over personal safety when walking. Lorena explained how her mobility choices were conflicted because she wanted to walk to maintain her health but that she had to balance going out against concerns over personal safety:

> My [high blood] pressure is better too [when I walk], but there's a higher life risk, not just. … It's my health, I'm not saying it's perfect. … It's better on the one hand and worse on the other, because it's always a life risk. … In the end, you go because you have to, it's really complicated, but we must have faith and move on.

There was the perception that the fear of crime was related to gangs involved in drug trafficking. Roger (male, age 24) expressed that this was a response to the lack of opportunities for young people and that the situation was deteriorating:

> Accessibility has been improved, the avenues …, but the matter of the community itself … tends to get worse as time goes by … the drug trafficking, the young kids take the wrong path of life in a very early age, with only few wanting the right one. … If you are a resident, they usually respect you … working in the security field, sometimes at night, I have to walk in a neutral way, in black clothes. I've been confused with the police several times. … They shoved me with a pistol, but one of the kids that was with them knew me from high school … then, they let me go.

Many participants described how they would plan their routes carefully and comport themselves so as not to attract attention. They would circumnavigate areas within the neighbourhood that they perceived as dangerous or impassable due to the activities of drug traffickers or the police. For example, Alan pointed out specific locations in the neighbourhood he regarded as dangerous but often had to walk through them after alighting his bus on his journey home from work to save a lengthy detour: 'I have no way to come home other than on foot, too. It's dangerous to take the route in that area near [location], but I take that route so I don't have to go all the way around.' Marcos, a health worker, who spends much time walking around the neighbourhood, greeting and stopping to talk to people along the way, explained how he and his team had established codes for certain areas on a map to categorise where to avoid based on how dangerous they are perceived to be with respect to violence. Some of our female participants explained how, when travelling on foot, they would not carry any valuables and would walk at a quicker pace while being fully alert to their surroundings. The time of day also affected journey decisions for both male and female participants. The effect on female participants was stark. Raquel highlighted how she was deterred from walking during hours of darkness, particularly on winter evenings while Silvana (female, age 41) explained how she

felt fear even when waiting at a bus stop, and how, on her return bus journey, she would often ask the bus driver to drop her off on the corner near her home.

> Sometimes 5pm is already night, and it is very dark here. Until I reach [street near her neighbourhood] I get scared. So, I probably wouldn't walk on those winter nights. (Raquel)

> The biggest problem is fear. This time, it's all about fear. If it wasn't the fear, it'd be cool to wait at the stop for 30 minutes, but what annoys me is insecurity. Having to stay there, you don't know, in a minute some crazy person may come by and mug you, so I try, always at night, I try to take the bus where I feel safer … I stay where there are people. (Silvana)

But some of male participants could also be deterred from going out at night as Roger explained, 'During the day, where I live is okay; at night, I no longer take walks'.

Participants also described the more extreme measures they had taken to include being escorted by car or simply minimising the need to go out by receiving the delivery of goods and groceries. Lorena, our oldest participant was one example:

> There was a shooting yesterday. When things like that happen, we get home early, my husband comes and picks me and any of my kids up and we. … [Interviewer: He picks up the neighbours too?] Yes, and the people that leave at this time get together and shut themselves at home, just leaving the next day. We live in fear today, so, the more you stay inside your house, the better. At the end of the month, you buy your groceries, pay your bills, which is easier today because you use the Internet, and stay at home.

On the other hand, Mogli described how cycling gave him a sense of autonomy despite the challenges of living in Cruzeiro, and meant that he had been able to delay obtaining his driving licence but still be able to travel beyond the neighbourhood to 'to get out of here and get to know a bit the outside, have a different perspective'. But he also recognised the challenges of cycling and the fear it could invoke:

> I've been a cyclist for a long time and I have some experience, so I know when I can or can't do some things, but I think it's awful for people who lack this experience and are starting just now. I believe that, when it comes to traffic, nobody shows respect. When somebody knocks me off [the so-called 'punishment pass'], it's okay for me, because I'm used to traffic already. … It is a really bad feeling. I think I've been knocked off four times.

Data from the social survey highlighted that, despite the perception of poor-quality infrastructure for walking and (particularly) cycling, and high levels of dissatisfaction with safety from crime, there was a high level of satisfaction with the neighbourhood as a good place to live and to raise children. There was a general strong sense of community that made them feel safer when they arrived near their own streets or alleys. Raquel expressed this paradox: while she expressed dissatisfaction with the state of infrastructure close to her home, she felt safer walking near her house, 'where she knows everyone'. Joana was clear that the neighbourhood was a good place to raise children stating, 'Look, I've raised all my children here and, for me, it [the community] is safe. If you don't get involved [with the drug gangs].' Indeed, time and again, our researchers witnessed serendipitous encounters between neighbours greeting each other in the street and finding time to stop and talk.

Throughout our immersive fieldwork we sensed a lack of faith in formal institutions. Joana was typical of residents who had little confidence in more formal social responses to problems.

Speaking about attempts to progress the Avenida Tronco works (Table 1) she explained that the community association had little information or influence stating, 'Well, they go there, but they never tell us anything certain. [They say] they will start and all, but they never do. It's always the same thing.' There was also scepticism about the motives of the Police or their ability to provide safety and security of residents. Lorena emphasised strongly how public security interventions were not seen in a positive way by people who live in the neighbourhood:

> Let me be really honest with you, I trust the crook more than the Police. I'm more protected by the crooks than the Police itself because they come politely, but not the cops. These are always humiliating people, cursing them, calling them names and all.

6. DISCUSSION

Our research has demonstrated how accessibility is highly conditioned by cultural and social as well as material infrastructures. Through attention to how mobility is 'staged from above' we demonstrated how the continued legacy of top-down autocentric planning and incentives to increase private car mobility has had a detrimental effect on walking and cycling. Using the case of Porto Alegre, we highlighted how the institutional context – dominated by far-right politicians and the real estate market – continues to produce an unevenness of mobility for people of different gender, age, race and income levels, affected differently in terms of accessibility (Silveira et al., 2022; Sheller, 2018). Our Greater Cruzeiro case study, provided a case in point of a low-income neighbourhood suffering the consequences of car-oriented infrastructure despite the promise of sustainable mobility infrastructure. The stalled implementation of the Avenida Tronco road scheme in Greater Cruzeiro provided an extreme example of how poorly conceived and partially implemented infrastructure has had a negative effect on the accessibility of residents – especially those travelling on foot or by cycle – in an already challenging environment, impacting not only their ability to fulfil immediate basic necessities, but also their long-term health and well-being. This corresponds with studies focused on community severance in Latin America, for example, da Silva Júnior and Ferreira (2008) who found that effectively there are restrictions on walking carried out by residents of an urban area sectioned by a highway in Uberlândia/Brasil resulting from the 'barrier effect'.

Our situated investigation of how residents 'stage their mobility from below' provides important insight into many aspects of accessibility in a typical Brazilian low-income neighbourhood, highlighting how mobility is highly relational and is often contingent on the support of family and other members of the community – particularly for women – as demonstrated in previous studies on mobility in Latin American cities (Giannotti et al., 2017; Hernández & Santos, 2020; Jiron & Gómez, 2018).

Our approach was able to excavate the 'mobility rationales' of how residents typically navigated their neighbourhood on foot and by cycle in the context of poor or non-existent infrastructure provision; 'route rationales' in terms of social interactions and how our participants circumvented 'troublesome areas'; and how 'embodied performances' affected how they comported themselves at different times and in different spaces. Our participant discourses highlighted how the threat of violence caused fear and restricted accessibility in certain spaces, especially by active modes, and, in extreme cases, led to immobility and chime with previous findings on this subject (Capasso da Silva & Rodrigues da Silva, 2020).

We also revealed the strategies that some of our participants used for accessing employment and other activities located in areas outside of the neighbourhood by public transport and how this could be expensive and time consuming and the challenges of accessing and alighting

at bus stops within the neighbourhood because of threats to personal safety and well-being – a common problem in many Latin American countries (Scholl et al., 2022).

Unsurprisingly, many low-income residents revealed their desire to buy a car for what is perceived as safer, more comfortable and reliable mobility, a somewhat common phenomenon in Brazil, where the automobile industry and mainstream media stimulate car dependence (Saraiva & Barros, 2022; Vasconcellos, 2018). There was, however, recognition of the negative impact of private cars on the community and the desire for improved conditions for walking and cycling (and public transport riding). Paradoxically, while these everyday challenges and lack of faith in formal institutions provide a strong incentive for residents to leave the neighbourhood, our research highlighted how the strong social bonds within the community underpinned perceptions of Cruzeiro as a 'good place to live'.

In summary, our approach to understanding accessibility as lived experience demonstrates the benefits of providing a more realistic picture of accessibility within specific spatial and social contexts. While this is not to negate the importance of studies that use 'objective' measures (e.g., distance, connectivity) we are mindful that this can overestimate the access potential (Arellana et al., 2020) and therefore researchers would be wise to be much more alert to the situational context on the ground.

7. CONCLUSIONS

In this paper we highlighted how transport studies have traditionally followed a rationalist, abstract approach to build information on accessibility, while the 'New Mobilities' paradigm has opened up new avenues for investigating movement at multiple scales and constructing knowledge about the meaning of accessibility. We demonstrated the potential of the 'Staging' framework as a heuristic that, in combination with a mobile methods approach, allows a deeper understanding of the complexities of everyday accessibility by constructing knowledge with participants. We responded to the gap in qualitative research on walking and cycling in Brazil and responded to Jensen's invitation for more 'critical mobility thinking', namely, to consider the social repercussions that different mobility arrangements and designs may have in terms of community accessibility and social inclusion/exclusion (Jensen, 2009). We highlighted how research on the 'lived experience' in Brazil (and South America) is still scarce and of the importance of understanding people's needs and abilities to make access by foot and bicycle more equitable, particularly given they are the main modes used by low-income groups.

We applied Jensen's (2013) 'Staging Mobilities' framework as part of a mixed-methods research approach to investigate walking and cycling in the case of a low-income community in Porto Alegre, Brazil. Our combination of social survey, biographical interviews, mobile methods and the application of Jensen's framework, went beyond reporting attitude and behaviour or representing 'objective' measures of accessibility across physical space, and enabled a deeper understanding of the lived experience of accessibility at a variety of scales: from the micro – details of challenges pedestrians faced navigating streets in the neighbourhood – to the macro-level, for example, accessing public transport stops to move beyond the neighbourhood. In so doing, we were able to co-produce with residents a deeper understanding of the reality, and quality, of accessibility when moving within and beyond the local neighbourhood. To our knowledge, our paper is the first to use the 'Staging' framework within the Latin American context as the few studies that exist have mainly applied it within the context of mobility in the Global North.

The research team was privileged to participate in a variety of 'spaces of engagement' (Bermingham & Porter, 2007) including people's homes as well as their immediate streets and public spaces resulting in participants being in more familiar territory and therefore having more sense of control over the research processes. Researchers were able to 'step into participants' shoes' and share the embodied experience of movement through different spaces

and atmospheres, allowing them to understand the strategies people use for moving around their neighbourhood and accessing places and to elicit (often taken-for-granted) tacit knowledge that they had accrued from multiple mobile experiences.

However, we should recognise that this approach is not without its challenges and shortcomings. First, we recognise that we were only able to gain a partial understanding of participant's experiences of mobility and accessibility and that such understanding can only ever be a small part of an individual's life experiences and is subject to their willingness and ability to articulate their feelings and experiences in words. Second, the research methods are time-intensive and so a relatively small number of participants were involved. While these can never be representative of the wider population, our sample was mostly made of young adults and those in middle age, so the experiences of, for example, children and older people are not represented. We may also not have reached those people who are less disposed to walking and cycling or are unable to use those modes. Those from seldom heard groups may also have not engaged, for example, those not wanting to engage with researchers from a formal organisation and those who were sceptical about the ability of the research to lead to effective change. Third, we have tried to be mindful of the preponderance of negative experiences that can dominate over more positive aspects of sense of place and that this can serve to stigmatise areas further.

Finally, conscious of our duty and desire to try to create positive change through our research, there is the need to communicate findings effectively, particularly to those in power. This can be a challenge for audiences more accustomed to 'objective' and 'valid' measures of transport accessibility. It is also important to recognise that the detailed and nuanced findings of the methodology adopted are specific to the local context and cannot be generalised more widely. However, we encourage greater use and experimentation with mixed-methods approaches to understand the accessibility challenges of localities. In this sense, our research also supports the claim that the 'Accessibility Turn' should push harder for decolonising research, adapting tools and co-creating novel approaches that move away from the impositions of Western/Global North countries by considering the significant socio-economic, cultural and spatial dissimilarities between the hemispheres (Ferrari et al., 2020; Keeling, 2013). We hope that this paper has drawn attention to how a pluralistic approach to understanding accessibility can help to inform more traditional quantitative studies and how this could contribute to more effective policy and practice at a local level, within a Global South context.

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AUTHOR CONTRIBUTIONS

Conceptualisation: TJ. Methodology: JV, TJ, BS. Fieldwork supervision: JV. Analysis of data: JV, BS. Data curation: JV, BS, TJ. Writing, reviewing, editing: JV, TJ, BS. Funding acquisition: TJ, JV. All authors have read and agreed to the published version of the manuscript.

DISCLOSURE STATEMENT

No potential conflict of interest was reported by the authors.

DATA AVAILABILITY STATEMENT

Data are available as supplementary material by contacting the Graduate Program in Urban and Regional Planning (PROPUR) at UFRGS (propur@ufrgs.br) and the Environmental Psychology Research Group at UnB (hartmut.gunther@me.com).

ETHICAL STATEMENT

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and national research committee and the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. The research was approved by the Research Ethics Committee of the Federal University of Rio Grande do Sul (reference number 2.019.940) and the Municipal Health Agency of Porto Alegre under number CAAE 58214416.9.3001.5338, on 18 April 2017.

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GEOLOCATION INFORMATION FOR CASE SITE

–30.06969407678887, –51.216439362986705

NOTES

1. 'Car' includes taxi/ride hailing.
2. Smaller than a public bus, often with air-conditioning, but more expensive.

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