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Cycling and walking: literature review



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Introduction

Walking is now the most common mode of urban travel in the world, on all continents except North America (Aguiléra and Guébert, 2014). In major American cities, the modal share of walking in terms of the number of trips is 1 to 4%, while in some European cities it sometimes exceeds 40%. In France, around a quarter of local trips are made mainly on foot, with an average duration of 14 minutes per trip (Ministry of Ecological Transition, 2019). However, the modal share of walking remains hard to observe, quantify and compare, because it is often embedded in mobility loops that involve the use of other means of transport. Walking is often still not seen as a real mode of travel, given how natural and obvious it is. Distances covered on foot are

generally hard to measure, even by pedestrians themselves. Recreational walking, on the other hand, is easier to categorise and measure. Indeed, data on this kind of journey on foot is more regular and reliable than data on daily and more utilitarian trips. Cycling, which is the alternative to walking in terms of active mobility, can be more precisely quantified. It is much easier to identify a bike trip, its distance and its travel time, and therefore to enter and report it in statistics. This is probably linked to the fact that this type of movement requires a vehicle, which consequently leads to a greater awareness of the trip. The modal share of cycling has had a completely different history to that of walking. Following the generalisation of bicycles at the end of the 19th century, linked to industrialisation and a concomitant decrease in price, cycling grew in popularity up until the post-war period - coinciding with the rise of cars - when suddenly it practically disappeared from cities. For example, in Sweden, the modal share of cycling by number of trips went from 80% during the Second World War to less than 1% in the 1970s (Emmanuel, 2010). Over the last three decades, cycling has nevertheless experienced significant growth, according to figures drawn from international and historical comparative studies (Buehler, et Puecher, 2021 ch. 1). Between the beginning of the 1990s and the middle of the 2010s, the modal share of cycling tripled - and even quadrupled in some American cities, such as Boston, New York, Chicago and San Francisco. It has also dramatically transformed mobility practices in some Latin American cities, including Santiago de Chile (twice as many trips by bike), Buenos Aires (six times as many) and Bogota (eleven times as many). We find a similar phenomenon in many European cities, such as Paris, Seville, Valencia, London and Vienna, where cycling remained marginal until recently but is now becoming an important part of people's mobility practices. Amsterdam, Copenhagen, and even some Japanese cities that are pioneers in the field, continue to see increasing numbers of kilometres travelled by bike. Finally, as far as France is concerned, it should be noted that cycling has been on the rise for several years (Héran 2019) and it now represents almost 3% of trips and 1% of kilometres travelled in people's daily lives at the national level (figures from the 2019 Personal Mobility Survey, in French: Enquête mobilité des personnes, or EMP). While these statistics reflect the general development of cycling, other figures reveal a growing diversification in terms of cycling purposes and profiles. While in North America, cycling trips are still mainly performed for leisure, in Europe, utilitarian motives are much more common (Buehler and Pucher, 2021, ch.2). A recent international comparative study found that commuting to work currently accounts for nearly 60% of bike trips in the 35 cities studied, and 40% within urban areas in the 11 countries being compared (Goel et al. 2021). The researchers also observed that, in

contexts where the practice of cycling was more widespread, there was a greater balance in terms of motives for cycling (work-related or not). The aim of this note is not to provide an exhaustive survey on these topics, but to offer an overview of the current knowledge on the matter, of avenues worth exploring in the future and of some more controversial topics, with a particular focus on sociological aspects related to these modes of travel. A great deal of research has been carried out on cycling and walking in recent years, but mainly in disciplines similar to engineering and operational research. We have opted instead to focus our attention on comprehensive and experiential approaches to cycling and walking, i.e. from the standpoint of geography, sociology, public health and traffic accidents, as well as ergonomics and urban planning. This document is organised by themes. The first two themes are dedicated to cycling and to the different profiles of cyclists. The next two themes (3-4) focus specifically on walking. Finally, themes 5-8 question different facets of these two active modes. In a short conclusion, we identify some themes that have been neglected by research but that are still important for promoting the practice of walking and cycling, even more so in the years to come.

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Conclusions

In the introduction, we defined the goal of this research note: to provide an overview of current research in social sciences and urban planning on the factors likely to promote lifestyles that are more focused on walking and cycling. What significant insights can we draw from this work? Without attempting to provide an exhaustive analysis, here are a few important points to take away from this review:

Walking as a means of transport is still poorly measured

Statistically, walking is still poorly measured. Pedestrian trips are not systematically recorded, as they are sometimes considered to be too short or to be nothing more than transitional gaps within travel loops that involve using other means of transport. This lack of measurement actually hides a devaluation of walking as a means of transport in daily life. As a result, basic data on walking is incomplete in many databases, making comparisons difficult and rendering this mode of transport invisible.

Research focuses largely on urban uses of cycling and walking

Research has developed considerably over the last five years regarding cycling (especially) and walking (a little). However, it is striking to note that the vast majority of this work concerns urban environments, and even more specifically, the urban living environments of the central districts in large cities. Although there are some studies on rural walking, the differences between the urban and rural worlds are always analysed with reference to the urban context. This urban lens and its influence on how pedestrians are represented do not correspond to rural populations and contexts. We should therefore develop criteria and methodologies based on rural realities, in particular to properly reflect walking conditions in these contexts.

Sensitive approaches to walking and cycling are poorly developed

Research carried out on walking and cycling remains very strongly influenced by quantitative approaches and, more precisely, by engineering approaches. As a result, there is a disregard for the sensitive and social dimensions of walking and cycling, and similarly, cyclists and pedestrians are insufficiently viewed as subjects with aspirations and free will. Yet these aspects are central to understanding the use of transport modes. The increased use of cycling as a daily means of transport is a case in point. In urban areas in southern Europe and to a lesser extent in Latin American

cities, cycling is largely practised as a factor of social distinction associated with young and educated urbanites expressing their environmental awareness by riding a bicycle. This distinction is sometimes complemented by political mobilisations: the idea that an object can change the world, the so-called *velorution*, is quite widespread. We therefore claim that it is absolutely essential to address these questions in the analysis of cycling practices.

The diversity of walking practices is poorly studied

Walking is not considered in its diversity and the walker is almost always reduced to a single individual, who is not carrying anything, who has no particular physical ailment and who can therefore move at a sustained pace. Walking situations involving several people (a family, for example), items being carried, children's strollers, the slow pace of elderly people, the need to rest en route and therefore have access to a bench - all these factors and more are generally overlooked when studying pedestrians and their experiences.

Comparative approaches offer a wealth of insights

Comparative approaches between cities and between countries offer a wealth of insights and should be developed. In the corpus that we reviewed, comparisons between European countries and Japan proved to be particularly instructive. With regard to social practices, they revealed very important sociocultural factors in the practice of walking and cycling that are rarely explained. Generally speaking, more comparisons deserve to be conducted and developed.

Historical research projects need to be developed

Some (contemporary) historical research projects uncover decisive factors for promoting cycling. These are particularly enlightening on the mechanisms of change and should be further developed.

User conflicts as indicators

Throughout our overview, the study of accidents and the analysis of user conflicts have emerged as powerful indicators of the obstacles individuals encounter when practising active modes. By developing research on user conflicts, we could achieve a finer understanding - through the lived experiences of pedestrians and cyclists - of the challenges they encounter when using these means of transport. Such an approach could allow for the assessment of pro-walking and pro-cycling public policies on the basis of their sedimentation in the built environment.

The diversification of the bicycle

Among future research avenues on the expansion of cycling, one important theme would be to look at how the diversification of bicycle options impacts the use of this mode of transport. We have long seen how the diversification of available options can broaden a product's adoption, such as in the automotive field with the expansion of model categories (low cost, premium, sedan, station wagon, coupé, minivan, SUV). The same phenomenon has been at work for a few years now with bicycles: first with mountain bikes, then with other variations such as recumbent bikes, folding bikes, cargo bikes, and more recently, with a generalisation of e-bikes and trailers. The reviewed literature reveals that these technical innovations allow for a wider use, facilitating the adoption of new lifestyles, especially for families wishing to make do without a car. E-bikes also enable cyclists to cover greater distances quickly and effortlessly, thus helping to change the purpose of trips performed by bike, especially for commuters. They also allow the elderly to reclaim this mode of travel. Similarly, since these new models have arrived on the market, cycling has also become popular in cities and regions with difficult topography or significant urban sprawl.

Cycling as a political mobilisation

Recent research on cycling shows that this mode of transport has become a central object of political mobilisation. The cycling revolution known in some activist circles as the velorution takes various forms. First of all, it refers to the desire to promote bicycle reuse and the circular economy, in particular through participatory repair workshops. It also refers to the desire to transform public space in cities, initiated by movements such as the "critical mass" that have spread throughout the world. Finally, it refers to feminist demands and to criticisms of capitalism. While research on these themes has been growing within social sciences over the last few years in Europe and in North and South America, it would be worth developing larger investigations. Indeed, these efforts suggest that pro-cycling movements are drivers of urban transformation and as such they should be taken seriously in urban policies.

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Chapô

Recent surveys by the Mobile Lives Forum show that around 30% of the French population live locally, yet many trips under 5 km are made by car. There is therefore huge potential for a modal shift to active modes of transport. The purpose of this

research note is to provide a thorough understanding of this paradox. It aims to explore, through a detailed overview of the current research in social sciences and urban planning, the ingredients that are likely to enable people to lead lifestyles in which walking and cycling are more regularly practised as a means of transport in daily life. This review allowed us to identify research questions that have already been well studied, as well as some blind spots. It led us on a journey through Europe, in particular Scandinavian countries, but also North America and Latin America where numerous studies are carried out, as well as Japan, a pioneering country in terms of research on walking and cycling.

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