



# Walking short distances. The socioeconomic drivers for the use of proximity in everyday mobility in Barcelona



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## ABSTRACT

Many studies have found that cities, with residents that are co-located with jobs and services in compact and diverse urban environments, generate positive outputs for a number of areas of social policy, with issues ranging from environmental to social and including public health. This evidence supports promoting rich and thriving neighbourhoods in order to encourage short distance mobility. In this context, we use a wide travel survey (EMQ06), undertaken in Spain, to measure short-distance travelling within Barcelona and to assess how distinct social groups make use of the local scale for their everyday mobility. The effects of socioeconomics and access to transport are discussed, prior to applying a Chi-squared Automatic Interaction Detection (CHAID) method, in order to explore heterogeneity among the different social groups, in terms of local travelling. We found that nearly a quarter of all daily mobility in Barcelona is performed with a local trip, and that short trips are more frequently undertaken for personal purposes. Also, age, gender and access to private transport appear as significant factors. Overall, our results suggest that a proximity scale is being used by those groups with greater time–space constraints, such as working women or low income people without access to private vehicles, opening important implications on transport policy regarding the design of proximity-prone environments.

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## 1. Introduction

Proximity is a spatial concept with a growing presence in most of the academic literature regarding cities and urban environments. New ways of understanding the city are arising around principles such as sustainability, liveable cities, knowledge economies or rethinking of urban values. Within this new academic debate, proximity appears as a transversal element in many of the arguments. Especially important is the tendency to consider it as a key to achieving increasingly sustainable urban models, in the environmental, social and economic senses. Proximity, in general, facilitates human interaction, economic efficiency and social cohesion (Huriot, 1998). More specifically, reducing distances between housing, jobs and services, makes it possible to reduce the kilometres travelled in motorised vehicles, in conjunction with an improvement in the accessibility for people's everyday mobility. As a result, in recent years, planning policies have, increasingly, focused on favouring shorter travel distances and active transportation, promoting localised and compact urban development (Manaugh and El-Geneidy, 2012). The literature has extensively explored walking as a modal choice (Middleton, 2009;

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Saelens and Handy, 2008), and also the use of short trips (Litman, 2012; Ory and Mokhtarian, 2009). There have been far less studies that have, specifically, explored the use of short walking trips, although some examples can be found in Rietveld (2000) and Ryley (2008). Our study endeavours to fill this research gap while, concomitantly, introducing some methodological novelties and assuming a new perspective: a short walking trip is not just a matter of travel choice, but a need that has been resolved in a short distance, by means of a highly sustainable type of journey.

Hence, the present paper sets with two major objectives: (1) to introduce a new measure for short-distance travel and local use, and (2) to understand the effects of socioeconomic factors and access to transport on people's activity spaces and their use of proximity. To do so, the rest of the paper is organised as follows: the next section reviews the concept of proximity, along with some of the literature that has explored the determinants of travelled distances. Section 2 discusses a new approach to proximity measuring, through modal choice and travel time. It also introduces some characteristics of the study area, along with data sources and methods of analysis. In Section 3, the empirical findings, based on modelling results, are presented and discussed. Concluding remarks are presented in the final section. The discussion will be based on Barcelona data, but the results are universal and the policy lessons are easily transferable to other dense and compact urban environments.

### 1.1. Proximity

Spatial proximity is a long-discussed aspect of urban science (Allen, 2000; Gubbini, 1997; Schmid et al., 2011). In being defined, simply, as how closely located are the physical elements of a city, it should not be conceived as a simple Euclidian measure (Bissell, 2013; Healey, 2004). Assessing proximity through geometric distance means seeing the city as an isotropic space, an abstract and theoretic concept, very far removed from the anisotropic character of actual urban spaces (Brunet, 2013). Urban space is not homogeneous, as locations and places with different gravitational forces draw more, or less, attention from the users of the city (Healey, 2004; Huriot and Perreux, 1998). At the same time, every individual has a different set of perceptions which shape his (her) own idea of the urban world by modifying the actual use that he (she) makes of the urban environment. As a result, neither Euclidean nor rectilinear distances serve any purpose in assessing people's use of proximity (Dumolard, 2011).

In defining proximity, more contextual factors such as shape, orientation, size or connectivity are also relevant (Brennan and Martin, 2012), just as the preferences and needs of the population are as important as the neighbourhood's built environment. The spatial use of the city is shaped by the combination of objective and subjective factors (Dumolard, 2011) and, consistent with Nussbaum's works (2003), proximity should, therefore, also be addressed from people's capabilities and not only from physical parameters.

What makes local travel desirable for urban planners is its benign environmental and social outputs (Manaugh and El-Geneidy, 2012). With respect to the environmental aspects, compact cities consume less energy and release less pollutants (Owen, 2009). At the same time, the promotion of non-motorised transportation alleviates congestion problems and has a positive impact on public health (Handy and Boarnet, 2002; Kerr et al., 2012). It is through this increased presence of active modes of transport that proximity also entails its main positive outputs on the social aspects. This modal shift from motorised to non-motorised creates more democratic urban spaces, that avoid monetary or skill discrimination and that, finally, are diminishing the social differences caused by diverse access to transport (El-Geneidy and Levinson, 2011; Rubulotta et al., 2012; Talavera-García et al., 2014). The absence of specifically needed abilities, such as having a driving license or monetary costs makes non-motorised travel, almost, universally accessible (Curtis and Scheurer, 2010). Hence, by making all the facilities in the city equally available to all kinds of people, proximity has the capacity to produce equal and socially sustainable travelling patterns.

### 1.2. Determinants of distance travelled: socioeconomics, access to transport and built environment

Each social group has its own travel necessities that are unequal and are defined by their demographic and socioeconomic status (Cerin et al., 2007). These characteristics determine daily needs, for which people are willing to spend more or less time, depending on their personal schedule. Time is a finite resource that is equal for everyone, regardless of wealth or social status (Madanipour, 2007). Within time, we have to accommodate all of our daily activities (Harvey, 1991). Upon these frameworks, every individual makes his own complex balance between activities, transport needs, and time available, which is demonstrated by their travel behaviour (Miralles-Guasch, 2011).

However, the exact distance that a person can travel in order to fulfil his (her) needs is strongly determined by access to transport (Morency et al., 2011). Uneven access to the different modes of transport, clearly, affects travel behaviour and, ultimately, people's travelled distances (Carse et al., 2013; Kenyon, 2011). Having access to mechanised transport, either private or public, is a precondition for making long journeys in short time spans, compressing time-space and making more locations available, hence, it has a great impact on activity territorialisation, modal choice and travelled distances (Scheiner, 2010). Together, time availability, personal needs and access to transport shape individual space-time prisms (Ritsema van Eck et al., 2005; Van Acker et al., 2010), a classic time geography concept that depicts the set of all locations that can be, potentially, reached by an individual, given a starting location and its temporal constraints (Mercado and Páez, 2009).

Overall, every social group has its own range of needs and every need must be satisfied somewhere within its available time-space prism (Chapin, 1974; Neutens et al., 2007). But, as aforementioned, urban spaces are heterogeneous and every

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