



Satisfaction or compensation? The interaction between walking preferences and neighbourhood design



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ABSTRACT

This paper describes a study on preferences, neighbourhood design and walking in a northern European setting. The aim was to examine how preferences for residential choice and modal choice play out regarding walking frequency in three neighbourhoods in the Swedish city of Malmö. The study design, unlike most earlier studies on the walkability of neighbourhoods, treated preferences as explicit variables predicting the amount of walking in a neighbourhood, rather than as control variables that alter the estimated effect of the built environment. The empirical material was examined with analysis of variance and multiple regression, which indicated that heterogeneous preferences resulted in a heterogeneous response, in terms of walking frequency, in one of the neighbourhoods. The suggestion for policy is that pedestrian planning should take the heterogeneity of preferences, and thus, of demand, into account.

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1. Introduction

Walking has been given increased attention in recent years, in both planning as well as in research, and much of the research has concerned the relationship between the built environment and travel behaviour (e.g. Sundquist et al., 2011; Van Holle et al., 2012; Saelens et al., 2003; Frank and Engelke, 2001). Several factors acting as representatives (or proxies) for the built environment have been used to study this relationship, including street connectivity, density, land use mix, type of urban fabric, to mention but a few (Handy, 2005). The focus of the research has been on objective built environment characteristics in the neighbourhood context, although these have usually controlled for socio-demographic characteristics.

In recent years, however, studies on travel behaviour have shown a growing interest in including *subjective* aspects both of the built environment and of travel itself (e.g. Kitamura et al., 1997; Bauman and Owen, 2009; Scheiner and Holz-Rau, 2007; Larrañaga et al., 2014). One major part of this interest has been to examine the role of preferences for residential choice, often termed an issue of self-selection (Bohte et al., 2009). This phenomenon refers to individuals selecting themselves into preferred choices rather than being randomly distributed (Hong et al., 2014). Self-selection effects come from preferences, attitudes as well as from socio-demographic characteristics. However, in the field of urban form and travel behaviour, the self-selection problem has mostly been understood as concerning preferences. This conception can be summarised as follows. The travel behaviour of residents in a neighbourhood can partly be explained by the fact that residents have selected to live in a neighbourhood that they perceive lives up to their preferences of, for instance, walkability.

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Consequently, neighbourhoods with a large share of walking could be understood as consisting of residents that have chosen to live where they perceive walking to be feasible, pleasant, etc., in addition to the built environment itself encouraging walking. Self-selection is then considered to either lessen or strengthen the effect of the built environment on travel behaviour (Handy et al., 2005; Hong et al., 2014). Thus, if preferences for residential choice are not considered in the analysis, there is a risk of producing inaccurate estimations regarding the effect of the built environment (Bohte et al., 2009).

The self-selection problem touches upon several issues regarding the relationship between the built environment and travel (Mokhtarian and Cao, 2008). With the commonly used cross-sectional datasets, it cannot be concluded that the built environment has a causal effect on travel behaviour. The use of longitudinal data is one way of getting closer to causality, although such datasets are relatively rare. To compensate this, variables addressing self-selection have often been used to simulate respondents' preferences regarding travel and residential choice before they moved, and thereby aiming to meet the criterion of temporality, that the cause precedes the effect – in this case meaning that the influence of neighbourhood design (the cause) precedes a person's choice of travel (the effect) (Handy et al., 2005; Mokhtarian and Cao, 2008).

This paper describes a study on preferences, neighbourhood design and walking in a northern European setting. The study draws on questionnaire data from three neighbourhoods in the Swedish city of Malmö. The aim is to examine how preferences for residential choice and modal choice play out regarding walking frequency in the neighbourhoods, and to explicitly study the interaction between preferences, neighbourhood design and walking. Our conceptual understanding of the relationship between these phenomena is described in Section 1.1 below, which also is the study's analytical point of departure.

1.1. The interaction between the built environment, preferences and travel

Chatman (2014) argues that earlier cross-sectional studies on walking behaviour have failed to recognise that individuals with different preferences may react differently to the same kind of built environment. Even though they have acknowledged that individuals have different preferences for residential choice, Chatman stresses that they have not been fully able to methodologically account for the existence of *differing responses* to the built environment, although they have understood it conceptually. For the sake of clarification and illustration, Chatman (p. 49–51) stipulates four different generic scenarios that describe potential interaction patterns between the built environment, preferences and travel, in the case of walking. The four scenarios are listed and illustrated in Fig. 1. The black lines (group A and B) represent the actual levels of walking related to walkability; the grey, dashed lines are the seemingly observed relationship if preferences are unknown, but people have still selected themselves into neighbourhoods that are consistent with their preferences.

1. Walking preferences have a fixed effect on walking; the built environment has no influence.
2. Walking preferences have a fixed effect on walking; the built environment influences walking the same way regardless of preferences.
3. People with walking preferences are more responsive to the built environment.
4. People with walking preferences are less responsive to the built environment, but have a higher rate of walking.

In scenarios 1 and 2, the observed effect of a neighbourhood's walkability is fully (scenario 1) or partly (scenario 2) due to differing preferences regarding walking in the study sample. In scenario 1 the built environment only affects residential choice, and not travel behaviour. In scenario 2 the built environment does influence travel, but the effect of preferences is still fixed. As with the common understanding of self-selection, when not taking preferences methodologically into account, the effect of the built environment might be exaggerated (Chatman, 2014). Scenario 3 and 4 describe cases where preferences has a non-linear relationship with the built environment. In scenario 3, those with strong preferences (group A) for walking are more responsive to changes in the built environment, and in scenario 4, those with a lower preference (group B) are more responsive to changes in the built environment (*ibid.*). This could be described as a case of *satisfaction* versus a case of *compensation*. In scenario 3, the built environment satisfies those in group A, while scenario 4 describes a situation where the built environment compensates for the low preferences of group B.

Our study, unlike most earlier studies on walkability, took an analytical point of departure in the scenarios 3 and 4, thus explicitly acknowledging that heterogeneous preferences implicate the existence of a heterogeneous responsiveness to the built environment.¹ In doing this, we also treated preferences as explicit variables predicting the amount of walking in a neighbourhood, rather than as control variables that alter the estimated effect of the built environment. Furthermore, to capture the effects of choices made both “before moving” to the neighbourhood (theoretically speaking) and the choices made on a daily basis, this study examined preferences for both residential and modal choice. This follows the reasoning of, for example, van Wee et al. (2002), in that preferences regarding residential choice and preferences regarding modal choice are understood as two conceptually and temporally different, yet related, phenomena. *Residential choice* refers to the aspects being considered prior to an actual change of residence or when considering current preferences for residential choice. Such preferences may include aspects of travel, but also affordability, aesthetics, fear of crime, the neighbourhood's reputation, etc. (Hedman and van Ham, 2012; Næss, 2009). Preferences regarding *modal choice* refer merely to attitudes regarding different modes of travel and any preferences towards certain modes. In some cases, these two types of preferences can address the same issue, e.g. the

¹ However, Cao (2015) explicitly examined the existence of heterogeneous responsiveness regarding driving and transit commute frequencies.

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