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Spatial variation in the potential for social interaction: A case study in Flanders (Belgium)

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ABSTRACT

Empirical evidence is mounting that good urban design fosters the formation of social fabric. Existing evidence is however limited in at least two respects. First, empirical studies have focused largely on social interactions taking place within the residential neighborhood, while leaving social encounters near the workplace unconsidered. Second, while various studies have examined the impact of the built environment on *realized* social behavior, there is as yet no empirical research on the *potential* for having social contact. A deeper understanding of the geography of social interaction potential is nonetheless important, for it is individuals' social opportunities rather than their preferences and actual choices that are most directly amenable to policy intervention. This paper seeks to address both issues in an empirical case study in Flanders and Brussels (Belgium). An exploratory spatial analysis is conducted to uncover spatial trends in the potential for social interaction in order to better understand the role of urban spatial structure in the production of social interaction potential.

1. Introduction

It is a truism that social cohesion and community interaction lie at the heart of society by fostering reciprocity and trust among citizens (Putnam, 2000). Communities with higher levels of supportive inter-personal interactions are likely to inspire educational achievement, civic engagement, economic development, responsive democracy, innovation and safety. At the individual level, being socially involved is conducive to health and well-being as well as the ability to find higher paying jobs.

The need to build communities that promote social and health welfare has long been a central concern among planning practitioners and scholars (Jacobs, 1961). Empirical evidence is mounting that good urban design encourages the formation of social fabric. In particular, low-density, automobile-oriented suburban development is said to be inimical to impromptu neighborly interactions, while high-density, pedestrian-friendly neighborhoods with mixed land-uses are credited with increased levels of neighborliness and social vibrancy. Freeman (2001), for instance, suggests a powerful negative relationship between the level of car use and the number of social ties in a neighborhood. Leyden (2003) and Lund (2003), for their part, found that people living in walkable neighborhoods tend to experience enhanced levels of social interaction relative to those living in automobile-oriented neighborhoods.

The alleged relationships between urban design and social interaction are often gladly employed by New Urbanists, New Town advocates and other urban reformists to buttress criticism of urban sprawl in favor of promoting compact urban areas (Sander, 2002; Talen, 2002). Meanwhile, however, a number of scholars have also brought opposing evidence to the fore suggesting that urban sprawl in itself does not necessarily undermine social contact. Regressing individuals' social interaction variables on census-tract density, among other variables, Brueckner and Largey (2008) observed that low-density living has a positive, rather than negative, effect on the propensity to engage in social activities. Hence, they assert that the argument of deterred social cohesion should not be incorporated in the panoply of critiques on urban sprawl. Likewise, Nguyen (2010) concluded that "compact living, as characterized by high population density and street accessibility at the county level, is unfavorable to social interaction, faith-based social relationships, and giving and volunteering".

Studies on either side of the debate, however, have at least two important limitations. First, they focus largely on social contact taking place within the residential neighborhood, while leaving individuals' social encounters near the work location unconsidered. In other words, the implications of urban sprawl and other design alternatives for individuals' commuting behavior across the wider metropolitan region are not accounted for. This is to be deemed a harmful limitation given that lengthy commutes may adversely affect the frequency and duration of being involved in

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social activities (see Farber & Paez, 2009, 2011 for a detailed study on this matter). Furthermore, the narrow focus on neighborhood social ties is in sharp contrast with empirical evidence suggesting a tendency toward decreased intra-neighborhood and increased extra-neighborhood socializing (Forrest & Kearns, 2001; Guest & Wierzbicki, 1999). Second, the existing studies examined the impact of the built environment on such *realized* social interaction variables as the frequency of socializing with neighbors, membership in hobby-oriented clubs and attending church, but did not assess the *potential* for having social contact. Gaining insight into social interaction potential is nonetheless important for it is individuals' potential rather than their willingness to partake in social activities that is most directly amenable to policy intervention. This view aligns with the long-standing tradition of time geography in the social sciences which emphasizes the importance of constraints on (joint) activity participation (Hägerstrand, 1970; Lenntorp, 1978). Also, considering *potential* instead of *observed* social behavior enables to circumvent the issue of self-selection (i.e. social people tend to prefer walkable neighborhoods, rather than walkable neighborhoods encouraging sociability).

In an effort to solidify our understanding of both aspects in the ongoing discourse regarding the link between urban form and social interaction, we have developed a method for measuring the social interaction potential at the scale of metropolitan regions. The method is described in detail in Farber, Neutens, Miller, and Li (2012), but its fundamentals will be recapitulated in the next section. The method makes allowance for commuter flows and time budgets as well as for the land-use and transport system within a region. It has previously been tested with experimental data of synthetically constructed cities with differing land-use configurations and daily commute-flow characteristics. This paper presents an empirical application of the metrics proposed in Farber et al. (2012). It uses actual data from Flanders (Belgium) and Brussels to perform an exploratory spatial analysis of the geography of social interaction potential in this region. The aim of this comprehensive exercise is to uncover spatial trends in the potential for social interaction in order to better understand the role of urban spatial structure in the production of social interaction potential. It should be emphasized, however, that this empirical study will look only at the space–time opportunities for having social (face-to-face) contact. The implications of having more such opportunities for social capital (Bordieu, 1986; Coleman, 1988) remain implicit and are merely hypothesized. The reader should thus appreciate that the potential for having social contact is an important, yet not the only prerequisite for accruing social capital. Various other structural and cognitive preconditions, including the quality of social resources (see Rostila, 2010), need to be considered to fully grasp the notion of social capital.

The remainder of this paper is organized in four sections. The next section describes the fundamentals of the method introduced earlier in Farber et al. (2012). Section 3 presents the study area, data, assumptions and computational aspects. Results are presented and discussed in Section 4. Finally, the paper concludes with a brief outline of the major findings as well as the avenues for future work.

2. Method

2.1. Conceptual approach

Central to our approach (see also Farber et al., 2012) is the derivation of the potential for social interaction from the intersection of space–time prisms (Fig. 1). A space–time prism is a key concept of time geography and gathers all space–time points that are physically accessible to an individual given one or more space–time anchors, the maximum velocity of physical movement and the minimum time required for some activity (Hägerstrand, 1970). Space–time anchors represent key locations in an individual's life, such as home and work, where activities with a high degree of space–time fixity are undertaken – that is, activities that are relatively difficult to re-schedule or re-locate in the short run. Space–time anchors condition physical accessibility by dictating where and when discretionary travel and activities must start and end (Cullen & Godson, 1975; Kwan & Hong, 1998; Miller, 2005a).

In recent years, several authors have relied on prism intersections as a way to model the potential for social interaction. Recent accomplishments in this field include the implementation of toolkits for querying and representing the opportunities for joint activity participation and intra-household interaction (Kang & Scott, 2008; Kwan & Lee, 2011; Neutens, Versichele, & Schwanen, 2010; Yu & Shaw, 2008), the theoretical formulation of necessary conditions for physical and virtual interaction (Miller, 2005b) and the development of an analytical framework for measuring joint accessibility (Fang, Tu, Li, & Li, 2011; Neutens, Schwanen, & Miller, 2010; Neutens, Schwanen, Witlox, & De Maeyer, 2008).

In line with these studies (Fang et al., 2011; Neutens, Schwanen, & Miller, 2010; Neutens et al., 2008), we will express the potential for social interaction in terms of the amount of time available for interaction with others within a particular time budget. As commuting constitutes the primary nexus of daily spatial mobility (Salze et al., 2011), the subsequent theoretical and empirical development will concentrate on the interaction possibilities within a single time budget between work and home. In other words, individual prisms will be anchored at the home and work location as depicted in Fig. 1. The model can be extended to other parts of the day and multiple time budgets in future research, with the appropriate modifications. As journey-to-work travel data for an entire metropolitan region is typically not available at the individual level, we will adopt a zonal approach and consider commuting flows from one zone to another. Hence, we will translate the microscopic rendezvous scenario between two individuals, as depicted in Fig. 1, to a general situation where an individual with a particular commuting pattern may socialize with all other commuters in a given metropolitan region. This means that we are concerned with the potential intersection of zone-to-zone commuting flows rather than prism intersections of separate individuals living and working at discrete anchor locations. In the next section we will explain more formally how these intersections can be computed.

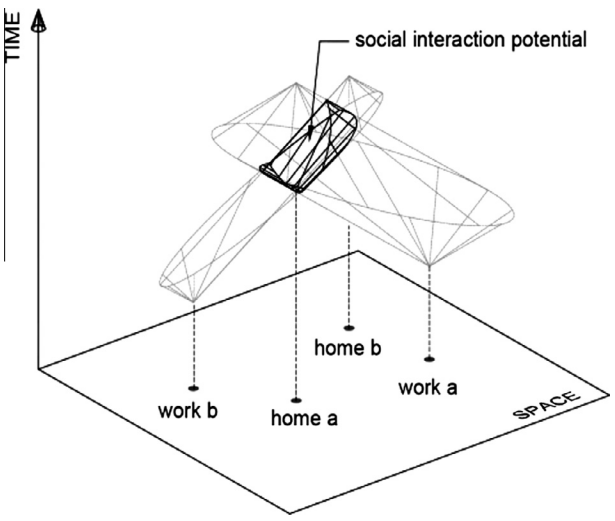

Fig. 1. Potential for social interaction at the intersection of two space–time prisms.