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Do partners influence each other's travel patterns? A new approach to study the role of social norms



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ABSTRACT

To better understand the role of social norms in relation to people's travel behavior this study addresses the question whether and to what extent partners in two-partner households influence each other's travel patterns. For example, is the male household head more likely to start using the bicycle if the female household head also uses the bicycle (and vice versa)? While this is a straightforward question, it has, to the best of the author's knowledge, not been explored in previous research. Using data from 958 couples from the German Mobility panel, the bidirectional effects between the travel patterns of male and female household heads are explored. To this end, the relatively new method of latent class transition analysis is used. The results show that, over time, travel pattern membership of the male household head influences travel pattern membership of the female household head and vice versa. Given that the effects are controlled for a range of individual and shared household characteristics, these results suggest that social norms at the household level play an important role. The paper concludes with an outlook on how the developed framework can be extended in the future.

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1. Introduction

In the transport literature a growing interest can be observed to understand the role of social influences in shaping people's travel behavior. This interest may be explained by the shared belief among researchers that social influences matter to a significant extent, and that, through a better understanding of their role, more effective transport policies can be designed (Sherwin et al., 2014).

Various approaches have been developed and applied over the years to reveal and assess the role of social influences on people's travel behavior. Behavioral scientists have, for example, taken an interest in capturing social influences in discrete-choice models (Fukuda and Morichi, 2007; Paez et al., 2008; Walker et al., 2011). Using spatial-econometric methods researchers in this field have tried to assess the influence of social network effects on individual decision making, e.g. the share a particular mode is used in a municipality on the individual decision to use this mode. While empirical applications are still scarce (Fukuda and Morichi, 2007; Goetzke and Rave, 2011), initial results are promising and support the notion that aggregate norms significantly affect individual behavior.

Most of the evidence of the role of social influences on people's travel behavior comes, however, from the widely-applied Theory of Planned Behavior, which (amongst other factors) assumes that the construct of subjective norms, defined an individual's perception of the social pressure from significant others to perform a certain behavior, influences people's intentions

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and subsequent behaviors (Ajzen, 1991). While the theory is hailed for its explanatory power, a major limitation is that social norms are subjectively measured. As will be argued more elaborately in the paper, claims of causality stand on weak ground due to this limitation.

This study aims to overcome this limitation and add to the existing approaches to study the role of social norms on travel behavior. To this end, it proceeds from the straightforward notion that the travel behavior of a person's significant other may be measured directly and that such measures may be regarded as objective indicators of a social norm. Based on this notion, it is argued that, since the most significant other of a person generally is his/her partner, especially two-partner households can provide an effective 'platform' to study the role of social norms. The travel behavior of the partner can then be regarded as a direct measure of a prevailing descriptive social norm at the household level. This line of reasoning supports the expectation that partners (in two-partner households) may influence each other's travel patterns. While this expectation is quite basic, it has, to the best of the author's knowledge, not been explored in previous research.

To reveal the bidirectional effects between the travel patterns of male and female household heads, the novel method of latent class transition analysis is used (Collins and Lanza, 2010). This method has previously been successfully applied to reveal transitions in people's travel patterns over time and assess which variables (e.g. life events) determine such transitions (Kroesen, 2014). In this study, it is assumed that the transition behavior (between various travel patterns over time) of the first household head depends on the travel pattern of the second household head (and vice versa).

To estimate a latent transition model panel data are required. These are drawn from the German mobility panel, a rotating panel in which households participate maximally three times. The empirical analysis is based on a pooled sample of 958 couples (from two-partner households) observed for three consecutive years at various points in time in the period from 1999 to 2009.

2. Modeling social norms within the TPB

To illuminate the contribution of the proposed new approach to study the role of social norms, this section positions it in relation to the most prominent conceptualization to study social influences in relation to travel behavior, namely the Theory of Planned Behavior (TPB).

As mentioned in the introduction, the TPB has been applied in numerous empirical studies covering various travel behaviors such as car use, public transport use and bicycle use (Bamberg, 2006; Bamberg et al., 2003, 2007; Bamberg and Schmidt, 2003; Hausteijn and Hunecke, 2007; Mann and Abraham, 2012). With proportions of explained variance ranging from 40% to 60% in the prediction of behavior, it has been hailed for its explanatory power (Gardner and Abraham, 2010). It has, however, also been criticized.

Most critiques do not reject the assumptions of the TPB as such, but propose extensions of the framework with additional explanatory factors. For example, with regard to the role of social norms, the construct of subjective norms has been criticized because it captures only the *injunctive* component of social norms, how people should behave, and neglects the *descriptive* component of social norms, how people actually behave (Heath and Gifford, 2002). Conceptually, both components represent relevant aspects of social norms (Cialdini, 2007; Cialdini et al., 1990). Several studies have capitalized on this omission and shown that measures of descriptive norms can explain additional variance in travel behavior (Eriksson and Forward, 2011; Gardner and Abraham, 2010; Heath and Gifford, 2002).

Apart from the neglect of particular factors, however, the TPB framework can also be criticized on more fundamental grounds. One fundamental point of critique relates to the assumed directions of causation (Weinstein, 2007). Theoretically, the effects between behavior and the psychological 'antecedents' may be assumed to be bidirectional rather than unidirectional. For example, a person's behavior may not only be affected by the construct of subjective norms, but, in turn, also affect this construct (since the he/she is setting a norm for others). With regard to travel behavior, the existence of such bidirectional effects has been established empirically in several studies published in the 1970s (Dobson et al., 1978; Reibstein et al., 1980) and more recently by Thøgersen (2006). However, TPB applications rarely consider such effects, even when panel data are being analyzed (Bamberg, 2006). A likely consequence is that, by neglecting reverse effects, the effects of the psychological variables on behavior are probably over-estimated (Weinstein, 2007).

What complicates matters further is that, even with panel data, establishing causal effects within the TPB framework remains difficult. This is because the psychological constructs are subjective in nature and, as a result, may (at least partially) be created 'on the spot', at the moment of questionnaire completion. Consider, for example, the measurement of subjective norms. To measure this construct respondents are typically asked to indicate their agreement with statements such as "people who are important to me think that I should use public transportation." Given the well-established human drive for cognitive consistency (Festinger, 1962), it is likely that such measures will be *instantaneously* biased by a person's current behavior. Because this reverse effect (from behavior to the subjective norm) is instantaneous, it is difficult (if not impossible) to statistically discriminate it from the hypothesized effect (from subjective norm to the behavior), even with the help of panel data.

It can be argued that the measurement of other psychological constructs, such as the construct of descriptive norms, probably provides less leeway for people to interpret and answer related questions in a self-serving manner. Still, even such measures may be affected by the described 'need-for-consistency' bias, since one is not measuring the behavior of other

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