



Is the intention to travel in a pro-environmental manner and the intention to use the car determined by different factors?

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ABSTRACT

This study makes use of a sample of residents living in the central parts of Sweden to compare psychological predictors of the intention to use three travel modes: the car, the bus, and the bicycle. An expanded version of the theory of planned behaviour containing separate measures of social norms is employed. The results demonstrate that attitude, subjective norm, and perceived behavioural control explained between 38% and 48% of the variance in intention to use various travel modes. In all cases, perceived behavioural control is an important factor and by adding descriptive norm to the original predictors in the theory of planned behaviour, the explained variance, with regard to biking and using public transport, increased by between 5% and 6%.

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1. Introduction

This study compares psychological predictors of the intention to use three travel modes: the car, bus, and bicycle, and in particular focuses on the importance of what we believe others expect from us versus what is perceived as normal behaviour. In previous studies, various theoretical perspectives have been employed to understand factors important for choosing travel modes. According to the theory of planned behaviour (TPB) (Ajzen, 1991), intentions are based on a combination of attitude toward the behaviour, subjective norm, and perceived behavioural control. Intention has a direct effect on behaviour, and under some circumstances, the same applies to perceived behavioural control.¹ Moreover, the theory stipulates different antecedents, or indirect measures, of attitude, subjective norm, and perceived behavioural control. Beliefs about the consequences of behaviours – behavioural beliefs – frequently influence attitude. Beliefs about the normative expectations of others, normative beliefs, influence subjective norm, and beliefs about factors facilitating or inhibiting behaviours, control beliefs, influence perceived behavioural control. The theory recognizes the importance of background factors, such as: personality, emotions, education, age, gender, and past experience although if they affect behaviour it would be via beliefs (Ajzen and Fishbein, 2005).

According to Cialdini et al. (1990), a distinction should be made between injunctive, or subjective norms, and descriptive norms. The former refers to beliefs about what is and what is not approved ways of conduct, what one ought to do, while descriptive norms are what is typical and normal behaviours, what is. With regard to modal choice, studies have found that descriptive norm is a significant predictor of using the car and the bus whereas subjective norm significantly predicted the intention to use these travel modes (Gardner and Abraham, 2008; Heath and Gifford, 2002), although Thøgersen (2006) found that only subjective norm was a significant predictor of using public transport. With regard to cycling there is some

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¹ Several studies have used the TPB to predict modal choice; for example, Bamberg and Schmidt (2003) on car use, Titze et al. (2008) on cycling and Forward (2004) on walk, cycle, and drive decisions. Intention is used as the dependent variable in this study instead of behaviour, but a fairly large number of studies suggest that intention is able to predict behaviour reasonably well; e.g. Gardner (2009) and Heath and Gifford (2002).

support for the importance of descriptive norms (de Geus et al., 2008). Several explanations have been given as to why descriptive norms are sometimes more important than subjective norms. One methodological explanation is that since descriptive norms often display lower means and larger variability compared to subjective norms, the risk for reduced variability is greater for subjective norms (Courneya et al., 2006). Other explanations are that the distinction is real and not only a methodological artefact. It has for example been suggested that descriptive norms are particularly important for behaviours that are rejected by the society at large (Manning, 2009).

Even though several studies have examined psychological predictors of travel mode choice, the focus has often been on examining a single travel mode making a comparison between different travel modes unfeasible. Moreover, in the context of modal choice few studies have treated subjective and descriptive norms as two separate constructs. Here we examine psychological predictors of the intention to go by car, bus, or bicycle. Based on Bamberg and Schmidt (2003) and Heath and Gifford (2002), we expect, attitude, subjective norm, and perceived behavioural control to be significant predictors of intention to use the car and bus. Although, only perceived behavioural control was found to be a significant predictor of cycling in a study by Forward (2004) when all the predictors in the TPB were examined, attitudes and social influences have been found to be important in other work (Titze et al., 2008). Descriptive norms have not been found to predict intention to use the car and public transport, although a few studies have found an effect on behaviour (Heath and Gifford, 2002; Gardner and Abraham, 2008), and there is some support for considering descriptive norms in relation to cycling (de Geus et al., 2008).

2. Method

The study was conducted in the municipality of Falun in the central part of Sweden. Falun is a small municipality with about 55,000 inhabitants (Statistics Sweden, 2006). A questionnaire was sent to a randomly selected sample of 2000 citizens aged 15–84 years and the response rate was 31%. More women than men answered the questionnaire, the mean age was 51, and more than 40% had university or college education. Almost 80% had both a driver's licence and access to a car, and about the same number had access to a bicycle. However, only about 20% had sometimes or always access to a bus travel card. Compared to the average for the municipality, the participants with higher education and who are women were greater than the average, but with regard to the possession of a driver's licence and access to a car, the respondents in Falun are comparable to other parts of Sweden.

In the questionnaire, the participants had to consider the trip they most often make during a week. The participants described the trip's purpose, how long it was and what travel mode was most often used. Fifty-eight percent made a work trip, 8% a trip to study, 24% to service and shopping activities, 7% to leisure activities, and 2% had other trip purposes. The trip length was between 200 metres and 670 km, with a mean length of 20 km. The most common travel mode was the car, chosen by 54% of the participants, while 15% used the bus, 16% the cycle, and 2% walked. The remaining 13% used different travel modes on different trips, combined different travel modes on the same trip, used transportation services for the disabled, the company car or car pooled. The level of car use was comparable to Sweden as a whole whereas the use of bus and cycling was higher and the level of walking trips was lower (Swedish Institute for Transport and Communications Analysis, 2007).

Following the description of the trip, the participants evaluated the use of car, bus, and cycling, but still with the same trip in mind, with regard to relevant TPB indicators.

Attitudes toward the three travel modes were assessed by a combination of behavioural beliefs and outcome evaluations. Initially, the respondents rated the consequences of using different travel modes, 13 different behavioural beliefs, on a seven-point scale (1 = strongly disagree, 7 = strongly agree). In relation to all the travel modes, the extent to which using that particular mode on the trip would improve their fitness level, making them relax, feel free, risk of being in a traffic accident, get to the destination quickly, making the trip inconvenient, spending a lot of money, risk of being attacked or threatened by others, get a pleasant journey, help to improve the environment, and finding the trip convenient since there are parking facilities or a bus stop outside work. With regard to driving and cycling two more consequences were assessed, having difficulties finding somewhere to park and being worried that the car/bike would be stolen or vandalized. Two different consequences were measured in relation to bus, finding bus changes complicated and the bus to be too crowded. Subsequently, the importance of each of the consequences was assessed on a seven-point scale (1 = not at all important to me, 7 = very important to me) to give outcome evaluations (e.g., the importance of improving the fitness level). Before combining the behavioural beliefs and outcome evaluations into measures of attitudes toward the modes, positive consequences (i.e., exercise, relaxation, freedom, quick, convenient, environment, easy to park/use the bus) were recoded so that higher values on all behavioural beliefs indicated a more positive belief. Each behavioural belief was multiplied with the respective outcome evaluation. Subsequently, the products were summarized and divided by the number of items resulting in a scale from 0.5 to 24.5 where a higher value signified a more positive attitude. The internal reliability for the attitude measures was all over 0.70.²

The two types of social norms were assessed using two indicators for both subjective and descriptive norms. For subjective norms the items "Most of my friends consider using the car/using the bus/cycling to be..." and "My family/partner considers using the car/using the bus/cycling to be..." was assessed on a seven-point scale ranging from completely unacceptable to completely acceptable. The items were recoded so that a high value indicated a stronger subjective norm. Descriptive norms were measured by the items: "My closest friends will themselves use the car/use the bus/cycle" and "My

² Values between 0.75 and one are considered to be high according to Aron and Aron (1998).

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