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Choosing a means of transportation: Two inquiries into situational and personal determinants of moving behaviour

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Two survey research projects on situational and personal determinants of moving behaviour have been carried out.

The Hilversum survey defines the problem of choosing a means of transport in relation to private mobility behaviour and the models and situational variables used for explaining this choice. We discuss the models which are normally applied to behaviourial science investigations in order to explain behaviour. Using various traditions we discuss attitude, social environment and the opportunity structure as separate complexes. These three are the determining factors in the basis model in which behaviour is the factor to be defined. Attitude is determined, at least according to the much used Ajzen and Fishbein model, by a person's expectations for the consequences of his/her behaviour and the value he/she places on those consequences. The (pressure from the) social environment can, in turn, also be explained. We also discuss the discrepancy between reasoned action - on which most explanatory models are based - and habitual behaviour. Finally, we describe a few other psychological factors which can influence human behaviour, such as the salience and the strength of the attitude.

More than 600 car drivers over a 4-day period monitored their movements in a journal and filled in a comprehensive questionnaire. The response was 78 resp. 79%. By means of this journal the most significant dependent variable was determined: relative car use (this is the number of movements made by car divided by the total number of movements). This same variable is also measured specifically for commuter travel and shopping trips. We determined, by means of the questionnaire, attitude(s), pressure applied by the social environment and aspects of the opportunity structure. Habitual behaviour was measured by means of a question about the means of transport used most within a household in general and for seven specific categories of mobility behaviour. The investigators tested different elements other than those specified in the Ajzen-Fishbein model, while measures of salience, knowledge questions and questions relating to the image of car use were included in the questionnaire as well.

Firstly we examine the aspects of the opportunity structure, such as distance, time difference, income, stage of family development, because these are situated the most to the left in this model of causal variables. Furthermore, they are the most concrete and recognizable. The variance in car use explained by these variables was generally narrow, less than 10%. The variable playing the most important role here is always the time taken to travel by

car versus the time taken to travel by an alternative means of transportation. Distance does not matter (provided that the time difference is taken into account) nor does income level. An exception to this is individual habitual-behaviour; here the structural variables accounted for 21% of the variance.

For all dependent variables, the explained variance increases considerably when the attitude is added to the model (thus habitual behaviour reached 33% of the explained variance). Subsequently adding perceived pressure from the social environment hardly leads to a rise in the explained variance. We mention in the context of the Ajzen-Fishbein model, which specifies that the product sum of other people's opinions and the tendency to be influenced by them (a common procedure but one statistically not accountable), can as well be replaced by the generalized tendency to be influenced by what others think and say.

The results proved disappointing with respect to the environmental salience: when attitude is already included in the model, no extra explained variance is recorded. The measure of environmental knowledge did not prove to be a useful instrument. The measures of misperception yielded clearly no data in the predicted direction. The measures of image in relation to cars, bicycles and public transport revealed interesting results.

We also tried to assess the strength of attitudes, in the way described by Fazio et al., in order to increase the prediction of mobility behaviour. The strength of attitudes was individually determined under laboratory conditions. This was performed on only 55 participants in the Hilversum survey because of its time-consuming nature. It turned out to be impossible to determine their strength due mainly to too many errors made by the respondents, far more in fact than reported by Fazio et al. As we found this unsatisfactory we repeated the experiment on a sample of 34 respondents with an academic background. Here too, so many errors were made that it proved impossible to determine the strength of attitudes.

The Utrecht survey was focused on the relationship between personality variables and mobility behaviour, especially commuting behaviour. The personality variables were: (1) if the person feels alienated or comfortable in society, (2) if the person feels powerless, especially concerning environmental problems, (3) if the person distorts reality, especially the self-enhancing illusion of one's own behaviour towards the environment (this means he/she perceives his/her own behaviour as being more environment-friendly than that of others), and (4) if the person expects he/she will behave in a more environmentally acceptable manner as the result of either voluntary or enforced changes.

For the elements of mobility behaviour to be predicted we used the following: (1) individual habits when choosing a means of transport, (2) the intention to reduce car use, and (3) the tendency towards cooperative behaviour.

The variables used were measured by means of a written questionnaire. The respondents were given questions and statements, partly taken from other research and partly developed for this particular study. All respondents were inhabitants of the city of Utrecht and were chosen at random from the telephone directory. Only people were chosen who had access to a private car and worked outside the home. The sample was compiled so that half of the respondents always went to work by car and the other half went to work, sometimes by car, and sometimes by an alternative means of transport. In both categories half of the respondents lived 15 kilometres at the most from work, which meant that it was possible for

them to use a bike as an alternative means of transport. The other half lived more than 15 kilometres from work which meant that the most important alternative means of travel for them was public transport. The questionnaire was completed by 329 respondents (the response was 82%).

The scale for measuring alienation proved to be only fairly reliable. The scale for measuring powerlessness was sufficiently reliable. Self-enhancing illusions were found to be present and reasonably reliable to measure. Voluntary or coerced behaviour change did not prove to be a reliable variable to measure. The analysis was, therefore, carried out with a number of separate items of the scale.

The habit of commuting by car and the intention to reduce this practice was measured by posing direct questions. The scale for measuring the tendency towards cooperative behaviour proved insufficiently reliable. We therefore decided to use the two most important questions of it relating to driving speed.

The habit of going to work by car proved to be predictable from a high self-enhancing illusion.

The intention to reduce commuting by car can be predicted, though less reliably, if a person expects this to be achieved on a voluntary basis rather than as a forced measure. When the respondents thought of restraint, they thought primarily in terms of the probability of receiving a fine for exceeding the speed limit.

The tendency towards cooperative behaviour can be predicted if one expects this to be achieved on a voluntary basis rather than by force; this also applies, but to a lesser extent, to a high self-enhancing illusion. The question of voluntariness or restraint applies here in particular to the intention to reduce car use for the benefit of the environment and in order to limit the number of fines. This latter variable, however, is conceptually related to cooperation.

No correlation was established between the variables of alienation and powerlessness (that were at least reasonably reliable to measure) and the three aspects of mobility behaviour. Relationships were also found between the dependent variables and other data obtained from the respondents, but these connections were weak.

All in all, the results from the Utrecht survey were negative if one believes that by using these measuring instruments, a clear increase in the predictability in the choice of travel mode for commuting would appear. In as far as the personality characteristics were reasonably and reliably measured, no relationship is shown to exist between them and mobility behaviour. This, however, can be seen as supporting the already established fact determined in the Hilversum survey, that deeply ingrained individual habits play a significant role in mobility behaviour. Although this particular behaviour proved to be correlated to a general environment attitude, still it is not considered to be the result of a configuration of personality characteristics. This behaviour originates primarily from a number of external factors.

Finally, several policy recommendations are described, partly related to the results from both inquiries.

Reference

I.M. de Boer, D. van Kreveld, P.G. Swanborn (1994) De keuze van een vervoermiddel. Twee onderzoeken naar situationele en persoonlijke determinanten van verplaatsingsgedrag. (Choosing a means of transportation: Two inquiries into situational and personal determinants of moving behaviour. With a summary and policy recommendations in English.) Utrecht: Vakgroep Sociale en Organisatiepsychologie, University of Utrecht.