

Consumers' pro-environmental attitudes and their use of public transportation

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1. SYNOPSIS

This paper reports findings of a study, investigating the effects of consumers' pro-environmental attitudes on their commuting behavior in the Theory of Planned Behavior framework.

2. ABSTRACT

Researchers and government policy-makers have usually assumed that consumers' ecological concern and positive attitudes toward sustainable development issues are reflected in their overt consumption patterns, as a preference for public transportation, for example. Yet, numerous recent studies have reported findings that seem incompatible with this notion.

Whether or not consumers' general pro-environmental attitudes, as compared to their specific attitudes towards the relevant behaviors, have an influence on their consumption patterns was investigated in the study reported in this paper. A relevant general environmental attitude dimension, reflecting a person's ecological orientation, was proposed to influence consumers' commuting intentions, and the proposition was tested by means of multivariate regression analysis. A modified version of Ajzen's Theory of Planned Behavior was used as a theoretical framework for the study.

The findings discussed in this paper suggest that consumers' beliefs of how much behavioral control they have, in choosing their commuting method, have clearly the most significant influence on their commuting behavior. Consumers' sense of behavioral control seems to be impaired mainly by various inconvenience factors associated with the use of public transportation.

The findings also seem to indicate that a relevant general attitude dimension may add to the prediction of specific behaviors. In fact, the paper presents findings suggesting that general attitude dimensions may even be better predictors of ecologically oriented consumption than attitudes toward specific behaviors. This seems to contradict, to some extent, with the Fishbein-Ajzen attitude theory.

3. INTRODUCTION

Marketing practitioners and government administrators, alike, have commonly viewed the green trend in consumer values and attitudes as a new market potential for environmentally safe products and services. Positive environmental attitudes are assumed to cause ecologically responsible behaviors for a number of reasons. Attitude-behavior consistency is said, for example, to maintain cognitive consistency (e.g. Festinger 1959) or a person's self-concept (Rokeach 1973, 215-217) or to simply be rational - people's attitudes toward acts are based on subjective evaluation of the utilities of behavioral outcomes of those acts, like in the Theory of Reasoned Action by Fishbein & Ajzen (e.g., Ajzen & Fishbein 1980). Unfortunately, however, an ample and cumulating body of research has demonstrated that changes in people's consumption patterns have, in fact, been fairly modest, and many researchers have reported findings of an attitude-behavior inconsistency in the context of ecological consumption (Haavisto & Lankinen 1991, Heiskanen 1992, Heslop & al. 1981, Hutton & Ahtola 1991, Uusitalo 1990).

From the administrators' perspective, these reports of attitude-behavior inconsistency seem problematic. Environmental protection and energy conservation policies have often relied heavily on providing information and influencing consumers' attitudes. If consumers' pro-environmental attitudes are inconsistent with their behaviors, measures aiming at changing their attitudes are obviously ineffective. Do consumers' pro-environmental attitudes, then, have an influence on their consumption patterns? Excluding the behaviorist approach to attitude research (see e.g., Foxall 1984), there are two major views to this problematic issue.

The terms 'ecological concern' and 'pro-environmental attitudes' usually refer to people's numerous environment-related general attitudes. Such general attitudes, first introduced in the traditional attitude theory (e.g., Allport 1935), are attitudes toward objects, people, or institutions, and they specify only the target of the attitude, e.g., environmental protection, but generalize across the remaining elements involved, such as the legitimate means of environmental protection in specific situations. The traditional attitude theory posits that general attitudes towards an attitude object influence all human behavior associated with that object.

In contrast, the more recent expectancy-value theories emphasize that human behaviors can be predicted reliably only from specific attitudes towards those behaviors. As Fishbein & Ajzen (e.g., Ajzen & Fishbein 1980, 88-89) point out, in different contexts and at different points of time, general attitudes toward a target may be unrelated or only weakly related to some behaviors that may be performed with respect to that target. People may act differently in different settings, because the beliefs underlying their attitudes vary in different physical, social, and psychological contexts. On a rainy day, for example, the evaluative beliefs underlying a person's attitude toward 'taking the bus to work' (thereby cutting down energy consumption and carbon dioxide emissions) may have very little to do with his or her positive attitude toward environmental protection. Therefore, in the Fishbein-Ajzen attitude model, (e.g., Ajzen and Fishbein 1980), general attitudes are entirely excluded and the concept of attitude is conceptualized as an attitude toward a specific behavior in a specific context.

In the context of ecologically oriented behavior, however, there seem to be grounds to propose that consumers' general attitudes toward sustainable development issues do have an effect on their ecologically relevant behaviors, irrespective of the contextual details involved. General pro-environmental attitudes often involve various affective elements, usually associated with moral concerns, e.g., ascribing responsibility to self or others for ecological consequences of human behavior, which may not be tapped by the relevant specific attitude measures. People may, for example, have a positive attitude toward an ecologically correct behavior, but this positive attitude is not reflected in their actual behavior, unless they feel a moral obligation or responsibility to engage in such behavior. Such moral concerns may well constitute an important affective dimension of a general pro-environmental attitude. In fact, too little attention has been paid to the structure of general environmental attitudes in the past research. Usually general pro-environmental attitudes have been conceptualized as unidimensional constructs only.

Consequently, the main purpose of the study reported here was to elaborate on the influence of consumers' general pro-environmental attitudes on their ecologically relevant behaviors, specifically on their use of public transportation to commute. To achieve this research objective, (1) a general attitude dimension, relevant in the context of ecologically sound consumption, was extracted, and (2) the effects of this general attitude dimension, as compared to specific attitudes, on consumers' behavioral intentions were investigated using a modified Theory of Planned Behavior -model (Ajzen & Madden 1986, Ajzen 1991).

4. RESEARCH DESIGN

4.1 Conceptual framework

To test the proposition that consumers' general pro-environmental attitudes have an independent effect on their ecologically relevant behaviors and to elaborate on the attitude-behavior relation in the context of ecologically oriented behavior, a conceptual model, based on Ajzen's (1986, 1991) Theory of Planned Behavior, was constructed. The model, which is presented in figure 1, proposes that consumers' behaviors that have environmental effects are determined by their relevant intentions, which, in turn, are dependent on (1) their specific attitudes toward the behaviors, (2) their subjective ecological orientation, (3) the subjective norms involved, and (4) the behavioral control that consumers perceive to have in the action situation.

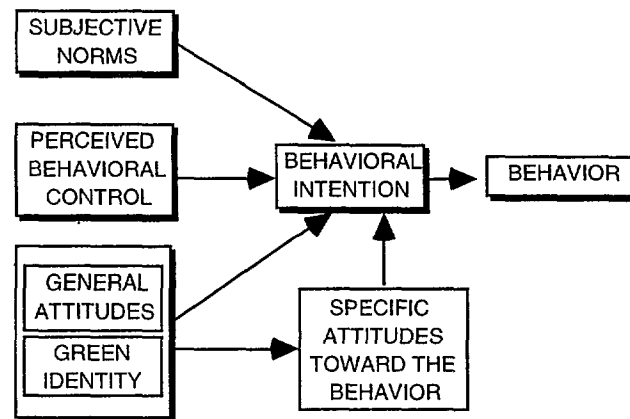


Figure 1. Conceptual model for predicting commuting intentions

In this model, the variable Subjective ecological orientation refers to a general attitude dimension that is comprised of consumers' environmental attitudes, and the degree of ecological consideration associated with their role identity as consumers. All the other variables in the model are defined according to the conceptualizations of the Theory of Planned Behavior. Thus, subjective norms are assumed to be products of a persons beliefs that specific individuals or groups think s/he should or should not perform the behavior in question, and his or her motivation to comply with the specific referent others. Perceived behavioral control is assumed to be formed by consumers' beliefs about the presence or absence of requisite resources and opportunities, and the perceived power of these control factors to facilitate or inhibit the performance of the behavior. And finally, a specific attitude is assumed to be a function of consumers' beliefs about the consequences of performing the behavior, and their evaluations of these consequences.

In the study reported here, the link between consumers' behavioral intentions and actual behavior was not investigated. In the Theory of Planned Behavior, which constitutes the theoretical grounding for the study, action is assumed to follow reasonably from behavioral intentions unless some unexpected situational factors inhibit consumers from performing the intended behavior (e.g., Ajzen 1988, 32). This assumption was also made in the study reported here. The focus of interest, then, was not the influence of various obscuring situational factors but the effect of general attitudes, as compared to specific attitudes, on consumers' commuting behavior. Therefore, the appropriate behavioral response variable, in the research design, was 'behavioral intention' not 'actual behavior in the past' nor 'actual behavior in the future'. Never-the-less, to investigate the influence of situational factors on attitude-behavior relation and to establish the causal relationship between the two variables, a longitudinal panel design, in which consumers' actual behaviors are measured or observed some time after measuring their attitudes, would be needed

4.2 Methods

4.2.1 Sample

To select the subjects for the study a random sample was drawn from the census register kept by Statistics Finland. The sample consisted of 2200 Finnish residents over 15 years of age. Altogether 1614 subjects agreed to participate in the study.

4.2.2 Measures

The study reported in this paper, was part of a more extensive research project, KULTIAS, presently being carried out by Statistics Finland. The data collection for the entire research project was carried out as a single survey and the data were partly shared among the different sub projects of the main project. The data were obtained by means of personal structured interviews, which were carried out in the subjects' homes by the interviewers of Statistics Finland department of Interview Services.

Consumers' general attitudes were measured with an indirect multi-item attitude measure. The 61 items in the measure included statements dealing with various aspects of environmental concern, consumers' perceptions of legitimate means of environmental protection and willingness to ascribe responsibility to self for environmental

problems as well as their role identity as green consumers. The general attitude dimensions were extracted from the single items by means of principal component analysis.

Consumers' specific attitudes toward using ecologically sound transportation methods to commute were measured with a direct single item attitude measure, assessing consumers' attitudes on a 4-point scale. The wording of the question was, "How, in general, do you feel about using public transportation to commute?"

Consumers' commuting intentions were measured with the following open question; "During the next following work week, on how many days do you intend to use public transportation, car pool or bicycle to travel to work?"

Consumers' subjective norm was measured with an indirect multi-item measure, obtained by computing factor scores for a relevant principal component. The beliefs underlying consumers' subjective norm included both personal transportation specific norms and norms concerning ecological behavior.

Perceived behavioral control measure was obtained using the same methods as with constructing the measure for the subjective norm. The beliefs underlying consumers' perceived behavioral control had to do with incompatibility of routes and time tables of public transportation methods, non-monetary costs in time and convenience involved, and necessity to transport equipment and other people when commuting.

The relation between consumers' general environmental attitudes and commuting intentions was investigated by regressing their commuting intentions on the determinants of behavioral intentions specified in the conceptual framework, i.e., attitude toward the behavior, subjective norm, perceived behavioral control and ecological orientation.

5. FINDINGS

5.1 Relevant general environmental attitude dimensions

To investigate the effect of consumers' general pro-environmental attitudes on their commuting behavior, it was necessary to investigate the structure of consumers' general environmental attitudes so as to find an attitude dimension that was relevant in the context of ecological commuting behavior. The relevant attitude dimension was assumed to reflect consumers' ecological orientation. In this subsection findings concerning the extraction of this general attitude dimension are presented.

5.1.1 Definition of relevance

The attitude dimension that would be relevant in the context of ecological commuting behavior was assumed to reflect consumers' overall behavioral and attitudinal ecological orientation. A helpful description of the elements of consumers' ecological orientation is given by Henion (1976), who defines ecologically concerned consumers as people whose values, attitudes, intentions or behaviors exhibit and reflect a relatively consistent and conscious concern for the environmental consequences related to the purchase, ownership, use or disposal of particular products or services. This concern may, of course, deal with the environmental consequences of both the consumer's own and other people's behavior. Consumers' ecological orientation can, thus, be viewed as being comprised of their values and attitudes as well as their ecologically relevant behaviors.

The concept of ecological orientation, as defined above, resembles the concept of ecological role-identity. A person's role-identity is usually theorized to be inferred by the person from the semantic and episodic knowledge he or she has about his or her behavioral and attitudinal tendencies (see e.g., Markus & Wurf 1987, Kihlström & al. 1988). This knowledge includes also information about a person's referent others' perceptions of his or her tendencies (e.g., Backman 1988). Therefore, from a consumer's point of view, his or her subjective ecological orientation can be viewed as his or her ecological role-identity, which incorporates all the environmental protection-related values, attitudes, and behavioral tendencies that a consumer believes to have, as well his or her perceptions of what other people think of him or her as a green consumer.

Consequently, the set of variables, assumed to be underlying the relevant general attitude dimension, included not only variables measuring consumers' own perceptions of their environment-related attitudinal and behavioral tendencies but also variables measuring consumers' perceptions of their referent others' views on their environmentally relevant tendencies.

5.1.2 Dimensions of general environmental attitudes

The general attitude dimensions that were obtained as a result of principal component analysis 1 were defined as Ecological concern, Ecological orientation, and Ecological skepticism.

The interpretation of the first factor, defined as ecological concern, was quite straight forward. The 15 variables that loaded highly on the factor measured consumers' anxiety or concern about global and national environmental problems at various areas of environmental concern. The factor explained 12% of the total variation in the variables.

The observable variables found to be underlying the general attitude dimension defined as ecological skepticism included various skeptic views about the seriousness of ecological problems and the need for environmental protection. These views included, e.g., that people are too worried about the environmental effects of human progress, that environmental protection causes unemployment and benefits only those who are well-off, that the media exaggerates environmental problems too much, and that Finnish policy makers are already paying enough attention to environmental protection.

Eventhough the percentage of total variance that the factor explained is fairly modest (6%) it seems to suggest an anti-environmentalist attitude dimension within the environmental attitudes of Finnish consumers.²

The factor defined as ecological orientation, included attitudes usually associated with the environmentalist perspective (see. e.g., Scheffer 1991). The attitudes associated with this dimension dealt with willingness to pay higher prices and taxes for environmental protection and willingness to accept a less convenient and less affluent way of life. The summed variable measuring green consumer role-identity also loaded highly on the factor. Many of the items dealt explicitly with the use of personal automobiles. The variables used to interpret the factor are given in table 1.

Ecological Orientation	Factor Loading
Willingness to pay considerably higher taxes for environmental protection	0,63
Advocating motor fuel taxes as disincentives for driving	0,62
Willingness to pay considerably higher prices for environmental protection	0,61
Advocating regulations for less packaging and wrapping, even if it would mean higher prices and less convenience	0,60
Advocating environmental taxes for personal cars to promote the use of public transportation	0,60
Advocating government financed campaigns to persuade people to cut down driving	0,58
Advocating speed limits for cars to protect the environment	0,55
Advocating a refuse disposal fee, proportionate to the amount of waste, for every household	0,54
Willingness to accept lower standard of living for environmental protection	0,54
Advocating environmental taxes for products containing materials that are difficult to dispose of	0,53
Advocating strict norms and considerable taxes for emissions	0,53
Identification with green consumer role-identity	0,47
Percent of total variance explained	12%

Table 1. Variables contributing to the general environmental attitude dimension defined as Ecological orientation

In sum, then, three mutually independent general attitude dimensions were found, of which ecological concern and ecological orientation accounted for most of the total variance explained. It was interesting to note that the dimension defined as ecological orientation included no elements of ecological concern. This dimension clearly represented willingness to accept responsibility for environmental problems as well as tendency to ascribe responsibility to individuals, not only to the government, for environmental protection. It seems, thus, that being worried about environmental problems does not necessarily have anything to do with environmentalism or with having strong opinions about the legitimate means of environmental protection. In addition, these data suggest that anxiety about environmental problems does not necessarily go hand in hand with willingness to accept personal responsibility for environmental protection.

5.2 Test of the constructed model

Corroborating the basic structure of the constructed model by correlational analyses (N = 531), evidence of association was found between intentions and specific attitudes (0,11), intentions and ecological orientation (0,23), intentions and perceived behavioral control (-0,45) and intentions and subjective norm (0,27).

To test whether ecological orientation adds to the prediction of intentions over and above the contributions provided by the variables specified in the Ajzen's (1986, 1991) model, intentions to use public transportation to commute the following work week were regressed on the variables specified in the model constructed for the study. The coefficient of determination for the regression equation was 0,24 and a F-ratio test value of 41.35 indicated that the overall regression equation was statistically significant on 0,000 level.

As expected, perceived behavioral control ($b=-0,39$; $df=526$, $p<0,001$) and subjective norm ($b=0,15$; $df=526$; $p<0,001$) both revealed independent effects. The proposed independent effect of pro-environmental attitude on commuting intention was also substantiated ($b=0,11$; $df=526$; $p<0,01$; the multiple R squared change being 0,04). However, no independent effect of the specific attitude on commuting intentions were found ($b=0,03$; $df=526$; $p=0,94$).

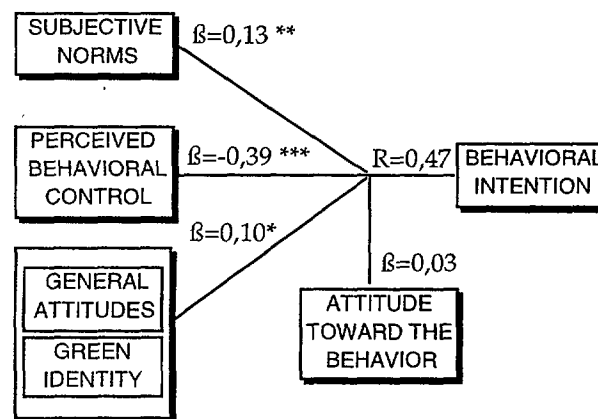


Figure 2. Regression of Commuting intentions on specific attitude, general attitude, perceived behavioral control and subjective norm associated with the use of public transportation and other ecologically sound modes of transportation. (* $p<0,05$; ** $p<0,01$; *** $p<0,001$)

In addition, a regression of intentions on the other two general environmental attitude dimensions, Ecological skepticism and Ecological concern, together with the other variables in the model, revealed no significant independent effects.

6. DISCUSSION AND CONCLUSIONS

6.1 Theoretical implications

Consumers pro-environmental attitudes are commonly viewed as unidimensional constructs; people are characterized, for example, as more or less environmentally friendly or ecological minded. The findings presented in this paper imply, however, that this conception of pro-environmental attitudes may be incorrect. The results of the elaboration on the structure of consumers' general environmental attitudes suggest that consumers' pro-environmental attitudes have at least two dimensions: concern and anxiety about environmental problems, and ecological orientation.

Therefore, in some cases, incorrect conceptualizations may well have been one, purely methodological, source of the attitude-behavior inconsistency reported in past attitude research dealing with ecological behaviors. If a general pro-environmental attitude has two dimensions, for example, there are possibly four different types of consumers, possessing different combinations of those attitude dimensions. Noting the difference between those types is obviously useful. It seems important, for example, to differentiate consumers who are only worried about environmental problems from those who are also willing to make sacrifices for the benefit of environmental

protection, as well as from those people, who have little anxiety over ecological problems, but feel a moral obligation to behave in ecologically responsible ways. If these distinctions remain undone, correlations between general pro-environmental attitudes and ecological behaviors may be lost. Also the findings reported here point in that direction. The regression analysis performed suggests a correlational relationship between consumers' general pro-environmental attitudes and their commuting intentions for one of the general attitude dimensions only.

The finding that specific attitudes toward using public transportation to commute did not have a significant independent effect on commuting intentions, whereas general pro-environmental attitudes did, seems to indicate that, in the context of ecological behavior, verbal expressions of general pro-environmental attitudes may tap some aspects of consumer preferences that are not reflected in the verbal expressions of specific attitudes. This finding seems contradictory, to some extent, to the propositions and assumptions of Fishbein-Ajzen attitude theory. Moreover, it supports the view that their approach may not be appropriate for the prediction of all ecologically oriented behaviors (Moisander & Uusitalo 1994). But, the preliminary findings presented in this paper, do not provide justifications to propose a new rival model, specifically designed for ecologically oriented behaviors.

6.2 Policy implications

The findings clearly indicate that consumers' beliefs of how much behavioral control they have, in choosing their commuting method, have the most significant effect on their commuting intentions. Consumers' sense of behavioral control seems to be impaired mainly by various inconvenience factors associated with the use of public transportation. Many people still think that using buses, trains and trams to commute, takes too much time and effort. Especially the time tables of public transportation methods were found inconvenient and incompatible with consumers' daily programs.

It is worth noting, however, that the concept of 'perceived behavioral control' is mainly motivational and does not necessarily reflect consumers' actual behavioral control. People's perceptions of what constitutes an acceptable degree of inconvenience, e.g., in the context of using public transportation, varies across different individuals. Therefore, it seems justified to assume that, consumers' perceptions of the degree of behavioral control they have in action situations, may be influenced by means of persuasive communication as well as social and financial incentives. In fact, to promote the use of public transportation, it may not be enough to deal with the actual behavioral control problems associated with mass transit. Consumers' commuting behavior may not change, unless they perceive that they do have the requisite resources and opportunities to behave in accordance with their positive environmental values and attitudes.

The finding that specific attitudes towards using public transportation to commute were not very good predictors of commuting intentions, may imply that the salient beliefs, underlying these specific attitudes, do not involve assessment of long term ecological consequences of commuting behavior. Consumers may not recognize or comprehend the link between driving and global warming, for example (see, e.g., Kempton 1991, Bell 1994). Therefore, another important objective of persuasion strategies, designed to promote public transportation, might be to educate the consumers so as to make them see the link between certain behaviors and environmental problems. To succeed in establishing this link, in consumers' memory, it would seem important to use affective appeals, such as appealing to important values and psychosocial consequences of ecologically relevant behaviors, in addition to purely rational appeals.

Consequently, social marketing interventions aiming at changing consumers' attitudes are not necessarily ineffective. It is important, however, to plan and target the intervention campaigns carefully. To discourage driving, for example, it is necessary to change consumers' attitudes toward accepting personal responsibility, in various forms, for environmental protection. Creating more anxiety about the state of the world may not help. In addition, it is important to make an attempt to influence consumers' perceptions of the degree of behavioral control they have, in choosing their commuting method. This may require, not only removing the actual resource constraints involved, but also tackling the motivational barriers associated with those constraints, i.e., consumers' perceptions of the acceptable degree of inconvenience to be experienced when using public transportation.

7. ACKNOWLEDGMENTS

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8. ENDNOTES

1. The dimensions were extracted using principal component analysis with Varimax rotation. Cases with missing values were deleted from the data. The number of cases available for analysis was 1384. The number of factors was determined by means of a Scree test. The three factors extracted explained altogether 30% of the total variance.
2. The number of questionnaire items measuring consumers' perceptions of possible negative impacts of environmental protection was small, which may explain the low percentage of total explained variance the factor accounts for.

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