

# **Attitudinal approaches in travel behavior research combining quantitative and qualitative methods**

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## **1. Travel behavior research and market-oriented approaches**

According to insights from travel behavior research, dependence on car travel and concern of its environmental imprint seem well substantiated [2]. Achieving sustainable mobility is about providing market-oriented and competitive alternatives to driving. This requires a clear understanding of travel behaviour, user needs and expectations [7] that could guide mobility services adjustments, meeting better the market addressed [26]. Active modes promotion needs also a well-defined audience [28].

Market-oriented approaches for travel behavior change include segmentation techniques enriched with qualitative attributes to explore behavioral aspects. Needs, beliefs and expectations vary significantly between market segments and evidence suggests that well-designed policies should target specific groups [2, 13, 24, 25]. Recent advances in travel market segmentation indicate the need for new user segments incorporating perceptions and attitudes [2, 13, 21, 26].

This work is in line with attitudinal approaches enabling travel behaviour change strategies. It gets feedback from sciences involving human decisions like psychology and (social) marketing. Those refer to pertinent behavioral theories, with inevitably quantitative and qualitative perspectives, like the Theory of Planned Behavior, receiving a growing interest in the transport field [3, 4, 10]. Complex travel behaviour could be explored through qualitative methods, interpreting conclusions produced by acknowledged quantitative techniques, which may give precise and testable expression to “qualitative” ideas [9].

## **2. Attitudinal dimension in user segmentation**

A growing number of travel surveys now include attitudinal questions to supplement data traditionally collected, deepening knowledge of market segmentation and enabling more people-oriented transport policies [23]. Although not classified as a qualitative method, such surveys provide a means for measuring qualitative factors, important in travel behaviour, through a series of Likert-scale attitudinal statements. Factor analysis often follows for

creating explanatory variables for travel behavioral models. Analyses consistently show that some attitudinal factors are often more significant predictors of travel behavior than traditional variables [9]. Combining psychological, socio-demographic and infrastructural variables can ameliorate predictions [29] and including environmental and activation attitudes may permit identifying relevant user profiles [18]. Such attitude-based approaches can provide important information on environmental measures and different mobility behavior aspects [12]. They can thus contribute to more efficient sustainable behavior promotion [5].

### **3. Attitudinal approach of travelers in Thessaloniki, Greece**

Departing from a large-scale quantitative survey in Thessaloniki (Greece), this paper presents an attempt to extract attitudinal attributes out of a revealed preferences approach and to further investigate user perspectives with qualitative techniques. The survey concerned a new ITS platform providing traveler information and suggesting alternative greener routes. Quantitative analysis was performed and the hypothesis made was whether user typologies could be derived to allow designing tailored sustainable mobility interventions. It aimed at testing the possibility to extract attitude-based parameters out of this initially strictly quantitative approach, even without psychometric techniques. From 4,815 survey respondents, this research focused on 3,132 car drivers. Following hierarchical cluster analysis, adapted for categorical data [16, 17] and implemented in CHIC analysis software [14], a traveler typology demonstrated differing degrees of environmental sensitivity and active mobility.

First type (T1, 727 individuals, 23.2%) has highest scores on active travel and physical activity practices, being the least car-dependent group. T1, with high preference for active modes and lifestyle, were named “active travelers”. Second type (T2, 1806 individuals, 57.7%) is the most car-dependent and least physically active. Missing any active character in their lifestyle makes them “non-active travelers”. Last type (T3, 599, 19.1%) shows high scores on active travelling practice and greener travelling intention with the highest value for environmental activism among all. They are “active and pro-environmental travelers”, in short “pro-active travelers”, considering sustainable lifestyle a desirable end in itself [18].

### **4. Use of identified travelers’ types for intervention scheme formulation**

The identified types permitted conceptualizing a behaviour change intervention scheme. The attitudinal attributes derived were included in a TPB based questionnaire. They also revealed possible audiences considering intervention tools of similar health and environmental interventions [11, 15] within travel perspective.

The work focuses on “non-active travelers”, being the largest and “problematic” group, with an acknowledged deficit of activism in general in their lifestyle. They constitute a challenging subject of an intervention aiming at inducing more sustainable travelers. Following a qualitative approach and specific inclusion criteria, pilot interviews were conducted with thirty T2 people for the formulation of TPB based questionnaire. Similar interviews were performed with mobility experts while pre-testing revealed the foreseen completion duration.

Another component of qualitative research [9] was the selection of a focus (experimental) group of thirty people out of the T2 pool, with similar to the pilot criteria. Also, a twin group of thirty people constituted the respective control group.

An intervention scheme was formulated and is being pretested according to relevant interventions’ taxonomies [1]. The selected tools included prompts, incentives, task assignments and rewards [6]. Exploiting input from health, psychology and environmental sciences and taking into account multiple research constraints, an effort was made to adapt the intervention scheme to the overall socioeconomic circumstances.

## **5. Conclusions**

In a trade-off between quantitative and qualitative aspects, this work argues that their appropriate mileage adds a different perspective. The key methodological implication is that starting from a large-scale quantitative survey and passing through a small component of preparatory qualitative research at the baseline phase of an intervention study, a quantitative comparative experimental approach was possible, involving tools used in qualitative research [9]. This methodological scheme can provide explanations, insights and hypotheses absent from merely quantitative data [20]. This work succeeded in deriving attitudinal attributes out of an initially strictly quantitative work and gave pace to new inquiries. The extracted types permitted the conceptual formulation of targeted intervention schemes as well as their practical implementation with a range of tools. Health and environmentalism promotion were integrated in a sustainable mobility perspective. Future steps involve the actual performance of the intervention scheme, currently being tested.

Implications for further research include theoretical development of sustainable travel behaviour within a social marketing approach. Strengths and weaknesses of this work and the efficacy of large-scale attitudinal segmentation need to be explored, combining methods to improve relevant policies.

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