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Workshop Synthesis: Measuring attitudes and perceptions in quantitative surveys

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Abstract

This workshop engaged participants in discussion about issues in incorporating qualitative information, namely attitudes, perceptions, and other psychological-social factors into transport research and analysis. There are many challenges to collecting this information from respondents. This synthesis summarizes the workshop presentations and discussion where participants identified the various types of information desired, reviewed the current challenges in conducting this type of data collection, made recommendations for practice, and outlined an agenda for future research.

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Keywords: qualitative data; attitudes; perceptions; psychological-social factors.

1. Introduction

As theories from psychology, such as the theory of reasoned action and the theory of planned behavior (Ajzen 1991, Fishbein 1967, Fishbein and Ajzen 1975), have become more prevalent in travel behavior research, there is increasing interest in assessing traveler attitudes and perceptions in qualitative and quantitative applications. These qualitative dimensions have been useful in explaining people’s travel choices, predicting their response to interventions, and understanding the behavioral process of transport decision-making (Clifton and Handy 2003, Kitamura et al. 1997). Drawing on the increasing experience using these dimensions in travel behavior and the knowledge from other

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disciplines, this workshop presented an in-depth discussion about the opportunities and challenges posed by the capture and measurement of attitudes and perceptions. It built on the themes and discussions of previous conferences that explored similar questions, particularly the workshop from the 10th International Survey Conference in Leura, Australia, (see “Workshop Synthesis: Measuring attitudes; quantitative and qualitative methods” by Carrasco and Lucas 2015).

The topics covered in this workshop come from a realization in the field that social-psychological factors, such as attitudes, are an important component to understanding behavior. This awareness has come about as the conceptualization of transport has evolved from a physical system to one that is human oriented (Jones 2014). With this progress, there has been an increasing awareness of theories and methods from other disciplines and an embrace of qualitative approaches. These “discoveries” have been impelled by the dissatisfaction with the somewhat ad-hoc theoretical approach and limits of current modeling to explain and predict behavior. The technological advances that have ushered in the era of big data have provided more detailed information about where, when, and how people are travelling but information about why they make these choices has not advanced at the same pace. Further, the increasing sophistication of modeling tools – such as mixed logit (Hensher and Greene 2003) and latent class models (Shen 2010) – have the ability to incorporate these subjective and qualitative constructs, assuming they can be measured and expressed quantitatively.

The workshop sought papers that advanced our understanding of how to achieve these ends. In the first session, four papers were presented that nicely framed the discussions to come, included in the references below (Singleton and Clifton 2017; Alemi et al. 2017; Maguire and El-Geneidy 2017; and Bouscasse et al. 2017). In addition, there were five other papers presented in the poster session that were associated with this workshop, also listed in the references (Stark and Hössinger 2017; Spitz et al. 2017; Gerber et al. 2017; Berger and Dörzapf 2017; and Moody et al. 2017).

2. Current challenges on measuring attitudes and perceptions

From these papers, the international group of participants from multiple disciplines engaged in a rich discussion (see the list of participants in the paper Acknowledgements). The questions posed by the group can be organized into four major themes: theory, context, methodology, and applications. This section reviews the questions discussed in each theme.

2.1. Theoretical themes

One concern that arose from this workshop was the lack of a comprehensive theory to guide our understanding of travel behaviour. For many studies, the theoretical framework is not explicitly articulated but rather it is often implied by the model specification. In others, behavioural theory is a mash-up of random utility maximization with some add-on ideas from other disciplines that are incorporated as additional variables. The field of psychology has many robust behavioral theories but are at times an awkward fit for transportation problems. Other fields, such as architecture and design, marketing, and human cognition and learning, may be fruitful areas of exploration for theoretical concepts that can be applied to travel behavior. Regardless, there is more that we can know about the role of attitudes and perceptions and a better theoretical grounding may help.

The theoretical discussion shifted to more specific concerns about the definitions of the various social-psychological concepts. The following concepts have distinct definitions in psychology but have often been applied in travel studies with little differentiation or concern about their interactions: values, attitudes, perceptions, comfort, satisfaction, motives/intentions, beliefs, subjective well-being, preferences, emotions, and feelings. The group discussed the degree to which our current measurement of attitudes is somewhat superficial, in that we fail to also capture the underlying values that may influence attitude formation. In fact, there is very little understanding of attitude formation and the endogenous relationship that attitudes have with behavior and experiences. These oversights in the transportation field may be due to the ad-hoc nature of many studies and the lack of clear theoretical guidance, as discussed above.
2.2. Context themes

The lively workshop discussions brought out many contextual issues in measuring attitudes and other constructs. The first of these - the temporal context - was raised in the workshop paper by Maguire and El-Geneidy (2017), where they explored key differences in respondent satisfaction when they were asked about the typical trip or a specific trip (e.g. the last trip). This also raises the question about the relationship between when questions are asked – while the trip is taking place or soon thereafter versus a recall question – and the responses. We know very little about the stability of attitudes over time and this matters in both the design and implementation of surveys and how these data are intended to be used to explain behavior.

The social context is complex and has multiple levels. First, there is the issue of social norms and cultural aspects that are reflective of a community. There is rarely an attempt to capture these group-level attributes. To the extent that they are considered, the concern is about the limitations of transferring model results that have been estimated from a specific place (and time). Participants expressed concern that these norms are often assumed to be correlated with socio-demographics, such as age cohorts, sex and gender, race/ethnicity, etc. For example, many recent studies on travel and activity choices of millennials suffer from the assumption that the social norms and values are strongly correlated with age. There was concern about aggregating individual attitudes to groups and communities, and assuming that these could be used to define social norms or culture.

Speaking of individuals, there are issues surrounding soliciting people about their attitudes and perceptions. These questions are by definition subjective and by nature, the individual needs to be self-aware of one’s feelings and sentiments and able to articulate them, or at least respond in a survey. For many attitudinal questions asked in surveys, the respondent may have never considered these aspects before and thus, has not fully formed a clear opinion, attitude or perception. As with any behavioural surveys, there are concerns about social-desirability bias, social awareness, and self-enhancement aspects for respondents. If respondents fear that their attitudes fall outside the norm or would portray them unfavourably, the information they provide may fail to capture their true feelings. Finally, as behavioural studies tend to focus increasingly on dynamics, temporal issues can play an important role in terms of perceptions changing over time, as well as the contrast among experienced, recalled, predicted, recent and peak perceptions.

2.3. Methodological themes

Unlike observable travel patterns, collecting psychological and social factors is complicated by the fact that passive data collection may not be feasible. However, this notion has been challenged as new methods are being developed to infer attitudes by relating them to biometric or physiological responses or associating them with other measurable actions. In this context, a good balance between quantitative and qualitative methods represents an opportunity to define key design decisions scoping breadth and depth, as well as deciding between in-person and remotely (e.g., web or mobile phone based) instruments. In addition, there is potential for balancing observational studies – adapted from other disciplines – with new tools to study responses at the social level (e.g., using social media and other broadcasting media), as well as at the individual level (e.g., studying facial recognition through machine learning techniques).

Workshop members recognized the need for further exchanging experiences about the process of constructing questions to capture attitudes and perceptions properly. In that regard, an important need is to balance the definition of standards for comparison across studies with respect to the design of adequate context-specific constructs. The balance in length is also a challenge, since it is not completely clear the optimal number of questions that can be asked to measure each attitude properly without compromising engagement and cognitive burden. Experimenting the appropriateness of scales and scores drawn from other disciplines for transport research can also help to improve the design process. In addition, a more explicit understanding of the meaning of scales used in Likert and other similar methods will help to assess the validity of attitudinal measurements.

2.4. Applications

The workshop discussion then focused on identifying key transportation applications or research domains where measuring attitudes may add value, and the current related challenges. In terms of these areas, the workshop participants identified travel demand management and travel behavior change as an area where measuring attitudes
may add value, especially in terms of aspects such as pricing strategies, encouraging using more sustainable modes, identifying different travel strategies, micro-targeting users, and nudging to system optimal. Second, as already discussed, attitudes and perceptions have the potential to enhance travel demand models, not only in its usual dimensions (production/attraction, destination, mode, and route choice), but also with respect to household location, including the need to control for self-selection. Third, measuring attitudes and perceptions can inform decisions related to a number of infrastructure design and investment decisions, such as parking schemes, pricing strategies, design of non-motorized infrastructure and streetscapes, and other public transit applications. Finally, other applications for measuring attitudes and perceptions include urban planning (e.g., land use type and development), safety and risk-taking behavior, reactions to new technologies, health perceptions, and perceived needs.

Despite this potential, it is not clear how to integrate and apply the study of attitudes and perceptions with planning tools and models, as well as adapting existing instruments to travel. As mentioned before, a proper interpretation of the elicited scores in the instruments is a key requirement, considering that those scores can be used as numerical indicators for quantitative models. Fundamental questions still remain in the application of these constructs, in terms of assessing to what extent those results are generalizable and forecasted. In fact, the value of including attitudes, specifically for these applications, needs to be tested against simpler methods, such as market segmentation. Finally, from an application viewpoint, methods need to test the feasibility of changing behavior through changing attitudes.

3. Recommendations for practice

After discussing theory, context, methods, and applications, the workshop participants identified recommendations to improve future practice on measuring attitudes and perceptions in travel surveys. In terms of purpose, the fundamental need of defining objectives and target groups carefully is very sensible to clarify which specific attitudes each specific study is measuring, and who are the audience and population that define the research’s scope. In that regard, an important recommendation is the need for a clear theoretical framework that could provide a strong base for building constructs and interpreting results. The Theory of Planned Behavior, for example, provides a strong base for designing the measurement construct. Yet, there is still an important need for translational research from Social Psychology to the Transport domain, not only to incorporate new techniques, but also to have a more explicit awareness about their potential and limitations.

In terms of methods, the workshop participants recommend considering the entire “toolkit” of different methods such as questionnaires, semantic differentials, qualitative, and open-ended approaches, in order to capture attitudes and perceptions in a multi-faceted way. Here, it is advisable to use multiple items to measure each concept, in order to facilitate proper response and understanding from the participants. Similarly, a minimum of three items should comprise these scores to reduce noise and ensure robust measures. In fact, more explicit quality control of attitudinal data is advisable by including multiple items as well as control questions, which could help researchers to measure the overall quality of engagement from respondents. Finally, in line with quality standards, it seems appropriate encouraging researchers to borrow standardized questionnaires, and further developing an item bank, with a menu of questions, items, and scores, which could help studies to be comparable in the future.

Finally, with respect to respondents, key recommendations discussed in the workshop include the use of different communication channels to reach different population segments and being careful in the recruitment process to avoid sampling biases that could interfere with the attitude of interest. It is also relevant to explain explicitly to respondents the reasons of including attitudes in the questionnaire, including the fact that similar questions may need to be included on each instrument. On a similar note, it is recommended to ensure that transport-specific terms be understood by the respondents. Although this latter issue seems to be an obvious recommendation, these kinds of explanations are not common in current studies.

4. Future research

As a synthesis, workshop participants identified key future dimensions needed to further develop our understanding of attitudes and perceptions. In terms of fundamental research, more thought is needed in the identification of the attitudes that should be measured on each context, with a more explicit consideration of the interests of policymakers. The state of the art is still very thin on understanding the stability and dynamics of attitudes and behavior, and the
interactions between attitudes, values, intentions, and behavior. In addition, further research is still needed to clarify which factors affect attitudes for different transport related aspects, and how they vary according to different geographic contexts. More comparative studies can provide the opportunity for testing methods and measurements, as well as comparing the influence of attitudes on behavioral intentions. Finally, a more technical and important practical research gap is the advancement of the imputation of attitudinal non-response, a common issue when collecting these kinds of data.

In addition to basic research, there were calls for more knowledge exchange with other disciplines, keeping up with related survey methods and theories from other domains. In fact, clarifying the specific meaning of concepts and definitions in the transport domain is an increasing need, considering the proliferation of studies measuring attitudes and perceptions, which could sometimes be very ad-hoc. In that regard, a useful effort could be performing a synthesis of related social theories, in order to contrast the experience from other disciplines with current methods in travel surveys.

In terms of applications and models, future research should advance developing instruments that could adapt better to specific contexts, but also facilitate comparisons among different studies. In the first case, attitudinal and perceptual constructs should be tailored to special groups and users, such as children, who are often left outside the scope of analysis due to the lack of meaningful constructs for them. In terms of comparisons, as discussed previously, a useful effort could consider developing standard instruments and an item bank specific for the key contextual dimensions studied in transport. Similarly, standardizing scales and scores shall help to transfer knowledge as well as to developing new useful constructs.

Finally, future studies can experiment on the feasibility of separating attitudes from travel behavioral outputs to reduce burden, using the potential of passive data collection and core-satellite designs (Goulias et al. 2011). Further effort for developing multi-instrument methods on each study seems to be a necessary step in that direction.

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