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Final Report

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Measuring and Modeling Travel Well-Being in a Dynamic Context

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Problem:

Travel behavior models typically assume that people base their travel choices on time and cost considerations and do not account sufficiently for qualitative factors that affect the choice. Travel choices are however more likely to be motivated by a desire to maintain or enhance travel well-being. In addition to time and cost, travelers value factors such as reliability, comfort, convenience, safety, etc. Thus, travel well-being is a broader concept that encompasses generalized cost. While there have been numerous studies that have measured some travel well-being in one form or another (happiness, stress, satisfaction, liking), most of these studies have been cross-sectional. Yet, well-being is a dynamic process, and measurements of well-being could produce different answers depending on the moment in time at which it is measured, such as under habitual or non-habitual travel conditions. Our aim is to assess these dynamics in travel well-being and to develop a modeling framework that captures the relationship between well-being and travel behavior.

Approach:

We contribute to the measurement and modeling of travel well-being or happiness in a dynamic context and analyze the policy implications. With respect to measurement, we conduct experiments in Switzerland (at Geneva airport and two universities: EPFL and UNIL) and MIT requiring employees who habitually commute to work by car to switch temporarily (for 2-3 days) to commuting by public transportation in return for free public transportation tickets. The idea is that before the experiment, the participants are in a routine condition of daily commuting by car, so they may not think a lot about their travel happiness; the role of the experiment is to break the routine and induce the participants to think about their commute happiness. We measure their happiness with the commute by car and their mode choice before and after the experiment. We also measure their happiness with the commute by public transportation after the experiment. The objective is to evaluate the differences in the happiness responses that they give before and after the experiment. In terms of modeling, we develop an extended modeling framework where the happiness measures are used as indicators of the utility: the pre-experiment measures as indicators of “remembered utility” of the car, and the post-experiment measures as indicators of the “decision utility” of car and public transportation.

Methodology:

We test for significant differences between the pre-experiment and post-experiment happiness measures using statistical tests. We develop an extended random utility modeling framework that incorporates the happiness measures as described above, and that also models the relationships between different notions of utility such as remembered and decision utility. We estimate the model using the maximum likelihood method.

Finding and Conclusion:

We found significant differences between the pre-experiment and post-experiment measures of happiness with the commute by car, which suggests that the timing at which happiness is

measured matters. One implication is that happiness measures that are to be used as indicators of decision utility should be measured at the moment of decision-making. In Abou-Zeid et al. (2012), we have explored psychological explanations that could explain the dynamics of the happiness ratings observed in the experiments, such as changes in reference points of the evaluation of the commute or effects of routine and habituation to the commute.

In terms of modeling, we found that the models that include happiness as indicators of utility in addition to the usual choice indicators increase the efficiency (i.e. the accuracy) of the parameter estimates (Abou-Zeid, 2009; Abou-Zeid and Ben-Akiva, 2010). We are currently testing such an approach with activity-based models.

We have also analyzed the policy implications of the experiment findings for institutions and public transportation agencies aiming at encouraging people to switch from driving to using public transportation, and we discussed the observed differences in mode switching between the Swiss and MIT cases. These policy implications are discussed in Abou-Zeid et al. (2012) and Abou-Zeid and Ben-Akiva (2012) and include various aspects such as the importance of customized marketing to individuals with a strong predisposition to switch to public transportation, the role of cost savings in inducing the decision to switch, the role of the free trial in increasing the awareness of people about the modal options available to them, and the role of institutional policies in terms of parking and public transportation subsidies that also affect mode choice decisions.

References:

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