

An integrated approach to measuring the whole journey passenger experience

Oded Cats *

Department of Transport Science,
Royal Institute of Technology KTH, Stockholm, Sweden

Yusak Susilo

Department of Transport Science,
Royal Institute of Technology KTH, Stockholm, Sweden

* Email: cats@kth.se

1 Introduction

The improvement transport level-of-service is always high on stakeholders and transport providers agenda. Transport authorities and providers use various standardized indicators in order to evaluate the system performance. These measures are based on passengers' travel satisfactions, such as comfort, value-for-money, punctuality etc. The same indicators are often used as explanatory variables of individual choice preference which are embedded as coefficients in the expected utility maximization approach. However, while travel satisfaction must be derived from the observed choices [1,2,3], expected utility models are estimated based on either stated- or revealed-choice preferences. It is therefore commonly assumed that experienced utilities are equivalent to expected or perceived utilities.

There is however a growing research which distinguishes between several notions of utility. Kahneman et al. [4] argued that there is a difference between experienced utility and decision utility. Experienced utility is the satisfaction with the outcome of a choice (i.e., the degree to which it is liked or disliked), whereas decision utility is the degree to which the outcome is desired when the choice is made. This implies that experienced utility which reflects satisfaction should be the subject of measurement rather than inferring decision utility from choices. In the context of transport, Carse [5] and Ettema et al. [6] claimed that the analysis of transport policy which aims to improve the level-of-service has to rely on experienced utility in its appraisal schemes.

The main objective of this study is to bridge over the current methodological gap between choice modeling and passenger satisfaction studies by establishing the relationship between

expected and experienced utility. The design of an ongoing survey with a unique set-up is discussed and its results will be soon become available.

2 Methodology

Research on travel satisfaction and benchmarking often consists of comparing the perceived performance as well as relative importance of various service aspects. However, how this perception is constructed and the extent to which these satisfaction impacts travel choices remains unknown. Exploring how does experience and decision utility interact is thus instrumental for evaluating measures to improve various service aspects.

The approach adopted in this study is to decompose travellers' expectations, experience and satisfaction by analyzing them at the trip leg level. The contribution of each stage along the journey (e.g. parking search, transferring, walking) and its respective attributes (e.g. duration, familiarity, deviation from expectations, exposure to Intelligent Transport Systems) to the overall trip satisfaction will thus be established. It is hypothesized that the relative importance of individual trip elements depends on traveller's attributes as well as the primary travel mode.

The analysis of the relations between expectations, experience and satisfaction will shed light on: (1) how does experience construct expectations; (2) how do expectations influence satisfaction, and; (3) how does satisfaction shape the form of future expectations. This gives rise to the notion of individual reference values which define the benchmark for assessing future conditions [7]. This implies that satisfaction is defined in relative terms. Furthermore, if our satisfaction level depends on the extent to which our experience satisfies our expectations and our expectations depend on previous experience than we may conclude that it is more important to be consistent than to become better. An ever improving service will lead to a shift in expectations which will result with the same satisfaction level. In order to establish the impact of travel satisfaction on expectations and hence choices, the perceived quality of non-chosen alternatives needs to be considered.

There is a growing research on the importance of risk taking in travellers' decision making process [8]. For example, there is evidence that incidents which deviate substantially from individual's expectations have a non-proportional impact on travellers' satisfaction with public transport [9]. The likelihood of such exceptional travel experiences is overestimated, especially by risk averse travellers. Real-time travel information could help reduce travel uncertainty and facilitate more adaptive travel decisions pre-trip (mode and trip departure time choice) as well as en-route (path choice). The adaptation exercised by travellers and its

interaction with travel information availability is analyzed by considering the impact of individual familiarity with alternative choices in the context of service disruption and overcrowded conditions.

3 Survey design

The study is based on a survey that is conducted as part of METPEX, a European project devoted to measuring passenger travel experience in integrated way for the whole journey. A small-scale survey is carried out in Stockholm, Sweden. Target user groups include car and public transport users, cyclers and pedestrian. Respondents are recruited at parking lots, major intersections and interchange terminals and main streets and cycling paths. This recruitment method enables to collect contextual data.

Respondents are asked about their experience on completed trip legs as well as their expectations with respect to the remaining trip legs. The analysis of this questionnaire is designed to capture the relation between individual perceived satisfaction, expectations and actual mode and route choice. Moreover, the role of subjective well-being and scheduling constraints in influencing travel satisfaction and choices on a given journey is investigated. The survey design explicitly addresses the extent of choice adaptation while accounting for uncertainty, weather conditions and travel information availability.

References

- [1] McFadden, D. (2001). Disaggregate behavioral travel demand's RUM side – a 30 years retrospective. In D.A. Hensher (Eds.) *Travel Behavior Research*. Amsterdam: Elsevier, 17–63.
- [2] Carrasco, J.A., Miller, J.E., Roorda, J.M. (2005). A tour-based model of travel mode choice. *Transportation*, 32, 399–422.
- [3] Hess, S., Daly, A., Rohr, C., Hyman, G. (2007). On the development of time period and mode choice models for use in large scale modelling forecasting systems. *Transportation Research Part A: Policy and Practice*, 41, 802–826.
- [4] Kahneman, D., Wakker, P., Sarin, R. (1997). Back to Bentham? Explorations of experienced utility. *Quarterly Journal of Economics*, 112, 375–405.
- [5] Carse, A. (2011) Assessment of transport quality of life as an alternative transport appraisal technique. *Journal of Transport Geography*, 19, 1037–1045.

- [6] Ettema D., Gärling T., Eriksson L., Friman M., Olsson L.E. and Fujii S. (2011). Satisfaction with travel and subjective well-being: Development and test of a measurement tool. *Transportation Research Part F*, 14, 167-175.
- [7] Kahneman, D. (2000). Evaluation by moments: Past and future. In D. Kahneman & A. Tversky (Eds.), *Choices, values, and frames*. New York: Cambridge University Press, 693-708.
- [8] Li Z., Hensher D. (2011). Prospect theoretic contributions in understanding traveller behaviour: A review and some comments. *Transport Reviews: A Transnational. Transdisciplinary Journal*, 31, 1, 97-115.
- [9] Friman M., Gärling T. (2001). Frequency of negative critical incidents and satisfaction with public transport services. *Journal of Retailing and Consumer Services*, 8, 105-114.