Transport Policy 27 (2013) 171–178

Contents lists available at SciVerse ScienceDirect

Transport Policy

journal homepage: www.elsevier.com/locate/tranpol

The road to happiness: Measuring Dutch car drivers' satisfaction with travel

Dick Ettema [a,*], Tommy Gärling [b,c], Lars E. Olsson [c], Margareta Friman [c], Sjef Moerdijk [d]

[a] Utrecht University, PO Box 80115, Utrecht 2508TC, The Netherlands
[b] University of Gothenburg, PO Box 500, SE-405 30 Göteborg, Sweden
[c] Karlstad University, SE-651 88 Karlstad, Sweden
[d] Centre for Transport and Navigation, PO Box 5044, 2600GA Delft, The Netherlands

ARTICLE INFO

Available online 15 March 2013

Keywords:
Well-being
Travel satisfaction
Car
Road characteristics
Traffic

ABSTRACT

Recent research suggests that travellers' anticipated trip utility may differ from the utility they actually experience when making the trip. This implies that it is important to investigate not only the factors underlying trip decision making, but also the actual experience of the trip. To that end, this paper presents an empirical test of the satisfaction with travel scale (STS) that was developed to measure travellers' satisfaction with travel. STS measures travel satisfaction in terms of two affective (positive activation versus negative de-activation and positive de-activation versus negative activation) and one cognitive dimension. The STS was applied in the Netherlands in a survey of car users. The results suggest that the reliability of the measurement scales is satisfactory to good, and that they are indicative of an overarching concept of travel satisfaction. Regression analyses carried out with the three STS dimensions as dependent variables show that STS is influenced by experienced traffic safety, annoyance with other road users, the trip being tiring, being distracted by billboards, and lack of freedom to choose speed and lane. In addition, travel purpose and personal characteristics play a role. Overall, the findings provide support for the validity of the STS as a tool to measure satisfaction with travel. It is concluded that using tools such as STS may provide relevant insights into how qualitative and design-related factors influence the attractiveness of trips made by car or other travel modes.

1. Introduction

An important aim of transport and traffic policy is to influence people to travel in societally beneficial ways. While some policies aim at promoting a shift away from car use toward more sustainable travel modes (Proost and Dender, 2008), other policies, such as road pricing (Tillema et al., 2010) and reward measures (Ben-Elia and Ettema, 2011) aim at changing car drivers' decisions about departure times or routes, leading to a reduction of congestion and local pollution. As a consequence, travel behaviour research has placed a strong emphasis on disentangling the factors that influence people's decisions about behaviour and behavioural change. Much less attention has been given to the issue of how people experience the trips they make as a result of their decisions. It is usually assumed that the factors that influence decision making will, to the same extent, determine how the outcome of a travel choice (a trip) is experienced. In practice, this implies that the utility that can be derived from, for instance, econometric discrete choice models based on observed travel choices is assumed to be identical to the experienced utility during the trip resulting from the choice.

Recently, research has been reported that questions this assumption. In general, it has been found that individuals a priori overestimate the emotions (both positive and negative) resulting from changes in their situation. This is because such positive and negative outcomes are emphasized during decision making, whereas the actual experience is affected by many other factors not considered when the decision was made. For instance, in the context of transportation, Pedersen et al. (2011) report that car drivers who voluntarily switch to using public transport evaluate their travel by public transport less negatively than they expected they would. In a similar vein, Schwartz and Xu (2011) and Xu and Schwarz (2009) report that travellers' general perception of travel often differs from their experience of actual trips. This is because their perception is framed in an (often socially constructed) view of what travel is supposed to be like, whereas the actual trip may be affected by unforeseen circumstances and events that distract from the actual trip itself.

From a theoretical point of view, Ettema et al. (2010) (see also Kahneman, 2000) argue that a distinction should be made between different forms of utility. Preceding a trip, individuals have an *anticipated utility* of the trip, based on previous experiences and information retrieved from others. In a more technical

* Corresponding author. Tel.: +31302532918; fax: +31302532037.
E-mail addresses: d.ettema@geo.uu.nl (D. Ettema), Tommy.Garling@psy.gu.se (T. Gärling), lars.e.olsson@kau.se (L.E. Olsson), Margareta.Friman@kau.se (M. Friman), sjef.moerdijk@rws.nl (S. Moerdijk).

0967-070X/$ - see front matter © 2013 Elsevier Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.tranpol.2012.12.006

sense, one could argue that the anticipated utilities associated with different travel options (e.g., modes) determine which choice is made. If measured by estimating formal discrete choice models, the anticipated utility is termed *decision utility*. The trip itself will usually consist of different stages (e.g., walking to the bus stop, waiting for the bus, sitting in the bus, etc.). Each stage (or even shorter periods within a stage) will result in momentary evaluations, termed *momentary utility*. After completing the trip, individuals will aggregate their experienced momentary utilities into a *remembered utility*. This remembered utility will influence their perception of a trip made by a specific mode as well as their anticipated utility before a next trip.

To date, investigating the experience of travel has received limited attention compared to the multitude of studies of travel choices?. Yet, we feel that this area is important for the following reasons. If momentary utility influences future choices, it is important to identify factors influencing it, which may differ from the variables conventionally included in travel forecasting models. For instance, qualitative factors, such as personal safety, cleanliness and atmosphere and specific incidents occurring during the trip have been found to influence momentary utility of public transport users (Stradling et al., 2007), but are not included in travel forecasting models. In the context of driving (Novaco and Gonzalez, 2009), traffic flow conditions and road layout have been shown to influence stress levels and pleasantness of driving, whereas behavioural models of for instance route choice only consider travel times. Thus, investigating which objective or subjective factors influence travel experience brings to the fore factors that also influence travel decision making and should be subject of deliberate policy making. In addition, knowledge of the factors influencing travel experience increases our insight into how travel can be made more enjoyable in itself.

Given the importance of investigating travel experience, this paper has two objectives. First, methods need to be developed to measure the momentary utility experienced during travel. Over the past years, efforts have been made to develop such approaches. Jakobsson Bergstad et al. (2011) developed a five-item scale to measure satisfaction with travel which focused mainly on cognitive evaluations of the trip. This approach to measuring travel satisfaction assumes that individuals are capable of remembering how they experienced an event (a trip in this case) earlier the same or previous day. As such it builds on the day reconstruction method (DRM; Kahneman et al., 2004) and the event reconstruction method (ERM; Schwarz et al., 2009). A close correspondence has been observed between measures obtained with reconstruction methods and momentary methods of measurement of experiences (experience sampling method; Stone et al., 1999). Jakobsson Bergstad et al. (2011) showed that satisfaction with travel correlated positively with car use and age. In a later study, Ettema et al. (2011) extended the measure, referred to the satisfaction with travel scale (STS), such that it now also includes affective dimensions. Ettema et al. (2011) tested the extended STS (see Section 2 for details) in an experimental setting. The results suggested that it has sufficient internal validity and responds to changes in activity and travel settings (time pressure, travel mode, travel time, and walk time) in the expected way. Thus, measurement tools developed to measure experienced utility appear to give satisfactory results when applied in experimental settings. However, further tests are needed to decide about the applicability of STS to measure experienced utility of travel. A first step is the application of STS to actual trips testing reliability as well as validity by investigating how STS varies across contexts.

A second research challenge in the context of measuring experienced utility is to investigate the factors that influence experienced utility. As noted, this is particularly important as the factors that influence experienced utility are not necessarily the same as included in discrete choice models assessing decision utility. There are indications that the experience of a trip is to a significant extent affected by 'soft' factors, such as for instance interaction with passengers, cleanliness, personal safety, use of materials, which are not easily foreseen when deciding about a trip. For instance, Jakobsson (2007) and Steg (2005) report psychological motives for car use, which refer to emotions evoked by driving a car (e.g., feelings of pleasure-to-use and freedom). Apparently, driving affects people's mood and partly explains why the car is perceived to be attractive and satisfactory to many people (Steg, 2005). It has also been found that symbolic (self-presentation) aspects significantly contribute to the positive utility of driving (Mokhtarian and Salomon, 2001).

Studies of commute stress amongst car commuters (e.g., Novaco and Gonzalez, 2009) indicate that stress is related to affective and cognitive assessment of travel, and that higher levels of stress are associated with higher impedance, less perceived control and less predictability. Obviously, congestion levels will have a large impact on such factors, implying that policies that influence road capacity or travel demand will have an impact on stress and satisfaction with travel. In addition, factors such as road design and traffic information may add to the predictability and perceived control of car drivers. Thus, apart from the aim of the present study to test the extended STS in the context of daily travel behaviour, another aim is to test whether STS can be used to identify which policy-related factors influence car drivers' satisfaction with travel.

The rest of the paper is organized as follows. Section 2 outlines the STS that was investigated in the present study. Section 3 describes the data collection. Section 4 describes the results. Section 5 draws conclusions and discusses further research efforts.

2. Method

An important aim is to test the application of STS to actual car trips and investigate the relationship of STS to external factors. The STS applied here is based on methods developed to measure subjective well-being (SWB). SWB is defined as an individual's cognitive and emotional well-being. According to Diener et al. (1985) SWB consists of two dimensions: cognitive and affective well-being. Cognitive well-being refers to an individual's assessment of his or her life in general, primarily based on his or her objective life circumstances. It is a judgment of one's life in terms of how good it is, rather than directly expressing one's emotions or mood. Still, it cannot be ruled out and it has been empirically demonstrated (Jakobsson Bergstad et al., 2012) that cognitive well-being is in part based on memory for emotional experiences. Cognitive well-being is measured using existing scales such as the satisfaction with life scale (SWLS) (Diener et al., 1985) or a single item scale (World Values Survey, 2005).

Affective well-being refers to an individual's emotional state. It may be measured by immediate self-reports of emotions or mood during execution of an activity or travel. Alternatively, affective well-being may be measured retrospectively. Schwarz et al. (2009) report that results from reconstruction methods, in which respondents recall how they felt during a specified past episode, are highly correlated with immediate reports. With respect to measurement scales, Watson et al. (1988) proposed the positive and negative affect scale (PANAS) to measure affective well-being. With this method, respondents indicate their affective experience by self-reports on a set of positive and negative adjective scales. Another method to measure affective well-being is the Swedish core affect scale (SCAS) (Västfjäll et al., 2002; Västfjäll and Gärling, 2007). It is assumed in this method that emotions can be decomposed into two underlying dimensions: valence (positive versus negative) and