Transport Policy 19 (2012) 93–104

Contents lists available at SciVerse ScienceDirect

Transport Policy

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

Happiness and travel mode switching: Findings from a Swiss public transportation experiment

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ARTICLE INFO

Available online 1 October 2011

Keywords:
Travel well-being
Dynamics of travel satisfaction
Reference points
Hedonic treadmill
Travel behavior modification
Mode switching

ABSTRACT

We present results from a recent experiment conducted in Switzerland that studies the effects of a temporary change in the mode of travel to work on travel happiness and mode switching. The primary aim is to study the dynamics in travel satisfaction ratings obtained before and after the intervention. Two behavioral mechanisms driving the change in satisfaction ratings are analyzed. The first one is that satisfaction ratings are influenced by reference points. The second mechanism is that satisfaction ratings are affected by cognitive awareness, whereby the disruption of routine travel conditions makes people think more fully about their travel happiness with different modes of transportation.

It is found that the measure of satisfaction with the commute by car obtained right after the temporary intervention is significantly different from the measure obtained before the intervention, and both behavioral hypotheses are supported by the pattern of change in satisfaction ratings. The policy and modeling relevance of different well-being measures obtained at different points in time is discussed.

As to mode switching, none of the 30 participants switched completely to public transportation after the intervention but a number of them continued to commute occasionally by public transportation. The relationship between mode switching and satisfaction and the implications of this intervention for public transportation agencies and other organizations interested in behavioral modification are discussed.

1. Introduction

The study of travel well-being has emerged as a major area of research, drawing on the many findings in the booming literature of subjective well-being or happiness (see, for example, Bruni and Porta, 2007; Kahneman et al., 1999; Van Praag and Ferrer-i-Carbonell, 2004). Understanding travel well-being and its relationship to travel behavior is important for enhancing travel behavior models, which include the generalized cost of travel but often exclude qualitative factors, and project appraisal methods that are mostly based on the assessment of travel time savings to users and ignore the value to non-users. A number of studies have measured travel happiness (Duarte et al., 2008, 2009a,b), travel liking (Ory and Mokhtarian, 2005), travel satisfaction (Ettema et al., 2011; Friman et al., 2001; Friman and Gärling, 2001; Jakobsson Bergstad et al., 2011; Metropolitan Council, 2007; Pedersen et al., 2009; Sacramento Regional Transit, 2006), and most notably commuting stress (Healey and Picard, 2005; Hennessy and Wiesenthal, 1997; Kluger, 1998; Koslowsky et al., 1995, 1996; Lucas and Heady, 2002; Van Rooy, 2006).

In previous research (Abou-Zeid and Ben-Akiva, 2011), we measured travel and activity well-being through a cross-sectional survey and found significant correlations between well-being and

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doi:10.1016/j.tranpol.2011.09.009

behavior. In this paper, we study the measurement of travel well-being in a dynamic context to test whether there are differences between measures of travel well-being obtained at different points in time. Well-being can be viewed as a dynamic iterative process, going from the anticipation stage to the behavior/experience stage to retrospective evaluation, with different measures capturing well-being at different stages in this process (Dolan and White, 2006) and therefore reflecting different notions of utility (Kahneman, 2000; Kahneman et al., 1997).

The context of our study is an experiment we conducted in Switzerland requiring a sample of habitual car drivers to switch temporarily to public transportation. Measures of satisfaction with the commute by car were obtained before this intervention when the participants were in a commuting routine, immediately after the intervention when the participants had to decide whether to switch to public transportation or continue commuting by car, and several months after the intervention when the participants were back in a commuting routine. In addition, satisfaction with the public transportation commuting experience was measured immediately after the intervention. We also measured pre- and post-treatment mode choices and attitudes/perceptions of commuting by car and public transportation, attributes of the commute, and socio-economic and demographic characteristics.

Using the different measures of satisfaction with the commute by car and the other data collected, we aim at testing two behavioral hypotheses that could explain changes in satisfaction ratings over time. The first hypothesis is that people evaluate alternatives, attributes, or experiences relative to a reference point (e.g. comparing one's current commute to a previous commute or to another person's commute) and rate their satisfaction accordingly. Changes in reference points over time (due, for example, to new experiences) would then cause changes in satisfaction ratings. The second hypothesis is that when people are in a travel routine, such as when commuting using a given mode, they are cognitively unaware of their travel happiness. Only when people evaluate their options and reconsider their decisions will they think of their travel happiness. The idea then is that through the direct experience with an alternative non-habitual mode, the commuting routine would be disrupted; people would then gain new information, confirm or update their perceptions about public transportation, and consequently re-evaluate their mode choice decision for the daily commute and think about their travel happiness.

In addition to examining these hypotheses, this study aims to measure the longer term effect of the intervention on mode choice and understand the relationship between travel happiness and behavior. This effort contributes to other efforts in the travel behavior modification literature that have tested the effects of various types of interventions on travel behavior, attitudes, norms, and other psychological factors, and examines additionally the relationship between public transportation satisfaction and mode switching.

The remainder of this paper is organized as follows. Section 2 reviews the behavioral theories underlying the two hypotheses mentioned above. Section 3 describes the design and implementation of the experiment we conducted in Switzerland. Section 4 presents the results of the experiment and tests the two behavioral theories using the collected data. Section 5 concludes the paper by summarizing the main findings and discussing the measurement and policy implications.

2. Behavioral theories

This section discusses two behavioral theories that may explain the dynamics in satisfaction or subjective well-being ratings.

2.1. Reference points: prospect theory

How do people evaluate their well-being? Schwarz and Strack (1991) argue that judgments of well-being are influenced by the available information and by the heuristics people use at the time of making these judgments. They present a model showing the influence of mood and comparison processes on well-being evaluations. Three types of comparison processes have been discussed in the literature: comparison to self, comparison to others, and counterfactuals (Schwarz and Strack, 1999).

Comparison to self involves comparing one's present situation with one's previous situation or predicted future situation. Perceived improvements in one's situation (e.g. a higher income, better health, etc.) lead to increases in ratings of well-being but this is limited by changing aspiration levels and adaptation effects. Comparison to others (or social comparison) is the most discussed type of comparison and involves comparing one's own situation to that of a comparison group and making judgments of well-being based on whether one is faring better (downward comparison) or worse (upward comparison) than others (Wills, 1981). However, the effect of social comparison on well-being is inconclusive (Diener and Fujita, 1997). Finally, counterfactuals refer to comparisons of one's current situation with hypothetical situations that did not happen but could have happened and making well-being judgments accordingly.

Thus, comparison processes involve reference points which are used as the basis of judgment. In prospect theory (Kahneman and Tversky, 1979), reference points are used as the basis of evaluation of outcomes; outcomes that are better than the reference point (e.g. larger monetary value) are perceived as gains and those that are worse are perceived as losses. A number of studies in the transportation field have attempted to explain route choice (Avineri, 2006; Avineri and Prashker, 2004), mode choice (Polak, 2008), or departure time choice (Senbil and Kitamura, 2004) using prospect theory and reference points. Avineri and Bovy (2008) discuss the difficulty of determining the reference point in a transportation decision context and offer a few suggestions for setting a value to the reference point in the context of travel time evaluation.

In the context of the public transportation experiment described in this paper, it may be argued that before the intervention the participants do not consider the public transportation commute when giving a judgment about their satisfaction with the commute by car because they have very limited or no experience commuting by public transportation; it is not clear what the reference point for the evaluation of the commute by car is before the intervention, but perhaps the participants would use salient attributes of their commute and certain comparison standards (such as a previous commute by car or the commute of another person). On the other hand, after the intervention and the direct experience with public transportation, the attributes of the public transportation commute may become the new reference point used in the evaluation of the commute by car.

2.2. Routine/non-routine situations: hedonic treadmill

Evaluation standards or reference points are not always clearly defined. As a result, it is not easy to evaluate well-being and "some people hardly ever think of it at all" (Lazarus and Lazarus, 1996). We postulate that this effect is more pronounced in domains involving routine behavior. Studies in the literature point to the potential cessation of affective responses under routine conditions and to dormant emotions when life is running smoothly (see, for example, Singer et al., 1978). Consider, for example, commuting, which is habitual in nature. Car commuters do not consider on a daily basis the choice of travel mode