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Travel and residual emotional well-being

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ABSTRACT

This study addresses the question of how work commutes change positive versus negative and active versus passive mood experienced after the commutes. Analyses are presented for 230 time-sampled morning commutes to work, made by 146 randomly sampled people in three different Swedish cities, asking them to use smartphones to report mood before, directly after, and later in the work place after the commute. The results show that self-reported positive emotional responses evoked by critical incidents are related to mood changes directly after the commute but not later in the day. It is also shown that satisfaction with the commute, measured retrospectively, is related to travel mode, travel time, as well as both positive and negative emotional responses to critical incidents.

1. Introduction

Over the past years an increasing number of studies have investigated satisfaction with travel (for reviews, see De Vos, Schwanen, Van Acker, & Witlox, 2013; Ettema, Gärling, Friman, & Olsson, 2016). In these studies retrospective measurement of satisfaction is made by means of self-report ratings some time after the destination of travel has been reached. The self-report ratings are either made of overall satisfaction on a single scale (e.g. Abou-Zeid & Ben-Akiva, 2010) or on multiple scales measuring affect and cognitive-evaluation dimensions of satisfaction (e.g. Friman, Fujii, Ettema, Gärling, & Olsson, 2013). The results show that satisfaction with travel is influenced by travel mode, travel time, crowdedness/congestion, social interaction during travel, solitary activities during travel, and weather conditions.

An issue not frequently addressed in this research is how travel affects changes in emotional well-being (EWB), measured as the balance of positive and negative affect that people experience in their everyday lives, which is regarded as the affective component of subjective well-being (SWB; Diener, Suh, Lucas, & Smith, 1999). A large current research literature (Diener et al., 1999; Dolan, Peasgood, & White, 2008) shows that EWB is important for people's life satisfaction. Evidence is also accumulating that EWB has non-trivial effects on morbidity and mortality (Diener & Chan, 2011). While EWB is affected by many other factors, positive or negative travel experiences may also have effects. It is therefore essential for transport policy making and planning that knowledge is acquired of how EWB is affected by travel, in particular by commuting to work as worldwide billions of people do every weekday.

A limited number of studies (discussed in the next section) have investigated effects of travel on retrospective measures of EWB, that is average reported duration or frequency and intensity of affect experienced during a past time interval. Yet,

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neither of these studies isolate the effects of travel from other effects, nor do they investigate how the effects of travel on EWB develop over time after travel. The empirical study presented in this paper measures travel-related residual changes in EWB by asking participants to report how they feel directly before and directly after a time-sampled morning commute to work and later after the commute. Our argument is that by focusing on EWB (also referred to as mood in this paper) on a short time scale, we more validly assess the effects of travel on EWB than measures of satisfaction with travel would do. We also measure satisfaction with the commute retrospectively to investigate differences in results compared to our measures of EWB.

In the next section we review previous studies investigating the effects of travel on retrospectively measured EWB and satisfaction with travel. This is followed by a conceptualization of our alternative approach to measure mood before and after travel. Aims, hypotheses, and method of the empirical study are then presented, followed by a description and discussion of the results. The final section discusses the implications of the results and charts avenues for further research.

2. Review of previous research

2.1. Emotional Well-Being

In measurements of instantaneous EWB (Killingworth & Gilbert, 2010; Stone, Shiffman, & DeVries, 1999), people report the degree of positive and negative affect during a specified activity or at a sampled point in time. Conventional self-report rating scales such as the *Positive Affect and Negative Affect Scale* (PANAS, Watson, Wiese, Vaidya, & Tellegen, 1999) or the *Swedish Core Affect Scale* (SCAS, Västfjäll, Friman, Gärling, & Kleiner, 2002; Västfjäll & Gärling, 2007) have been used to both instantaneously and retrospectively measure positive and negative affect. In retrospective measurements, the remembered frequency or duration and intensity of positive and negative affect during a past time interval are reported. The affect balance is a common index of EWB obtained by aggregating repeated ratings, such as the ratio of the frequencies of positive and negative affect (Diener, Sandvik, & Pavot, 1991), the difference between the average intensity of positive affect and the average intensity of negative affect (Kahneman, Krueger, Schkade, Schwarz, & Stone, 2004), or the difference between duration-weighted positive and negative affect intensities (Krueger & Schkade, 2008).

Emotional responses evoked by travel would potentially influence the affect balance. In Kahneman et al. (2004) commuting was found to be less associated with positive affect and more associated with negative affect in retrospective measures of emotional responses, when compared to other activities. Yet, the overall evaluation of the commute was positive. Morris and Guerra (2015a) analyzed travel data from a large US sample, where a retrospective aggregated measure had been obtained of mood (based on 0-to-6 ratings of happiness, sadness, tiredness, pain, and stress) during the preceding day. Excluding purely recreational travel, the results showed that daily travel only accounted for a few percent of the variance in mood. This was still not a trivial effect compared to several other activities included in the same study. Stone and Schneider (2016) found that commuting episodes during a day were rated high in stress and tiredness, but low in meaningfulness compared to other activities on the same day. Commutes to work were found to have less negative effects on tiredness than commutes home, while longer commutes were found to increase stress and tiredness. Jakobsson Bergstad et al. (2011, 2012) showed a direct effect of satisfaction with travel on a retrospective measure of the weekly affect balance as well as an indirect effect through self-reported affect associated with performance of frequent travel-related out-of-home activities during the week. Olsson, Gärling, Ettema, Friman, and Fujii (2013) found that retrospectively self-reported positive affect decreased with the duration of work commutes. Morris and Guerra (2015b) confirmed the negative association between travel time and mood, primarily because of increased stress, fatigue, and sadness on long trips. Feng and Boyle (2014) analyzed data from a large-scale British study concluding that long work commutes are more strongly associated with negative mood for women than men. A higher load of household duties and more trip chaining were proposed explanations of the observed sex difference. Humphries, Goodman, and Ogilvie (2013) failed however to find any relationship between commuting by physically active modes and mood.

2.2. Satisfaction with travel

The previous research thus suggests that one determinant of EWB is daily travel and its characteristics. Travel conditions also influence the evaluation of travel itself. To measure this we developed the *Satisfaction with Travel Scale* (STS) (Ettema et al., 2011; Friman et al., 2013). The STS entails nine self-report rating scales that may be applied to any mode of travel to retrospectively measure affect or mood during travel as well as a cognitive evaluation of the quality of travel (Ettema et al., 2011; Friman et al., 2013). Affect or mood as measured in STS varies along two dimensions that are orthogonal to each other and oblique to the valence and activation dimensions in SCAS (Västfjäll & Gärling, 2007; Västfjäll et al., 2002), one ranging from positive activation (positive valence, high activation) to negative deactivation (negative valence, low activation) and the other from positive deactivation (positive valence, low activation) to negative activation (negative valence, high activation). Friman et al. (2013) argued that the affect dimensions as defined in STS measure the most common categories of mood or affect (e.g. stressed, relaxed, bored, enthusiastic) during travel. Some studies (e.g. De Vos, Schwanen, Van Acker, & Witlox, 2015; Ettema et al., 2011) have found that the affect dimensions of the STS are positively correlated. This should not be interpreted such that the dimensions measure the same theoretical construct, but that they correlate when measuring