Satisfaction with Travel and Subjective Well-Being: Development and Test of a Measurement Tool

Dick Ettema, *Utrecht University*
Tommy Gärling, *Karlstad University and University of Gothenburg*
Lars Eriksson, Margareta Friman, Lars E. Olsson, *Karlstad University*
Satoshi Fujii, *Kyoto University*

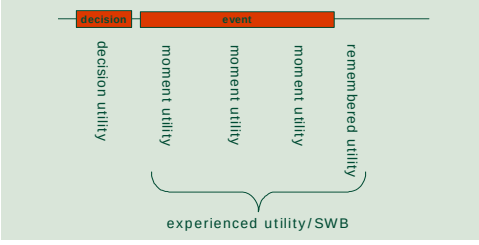
Abstract
The universities of Karlstad (Sweden), Göteborg (Sweden), Utrecht (The Netherlands) and Kyoto (Japan) have launched a joint research project to investigate the relationship between travel and subjective well-being (SWB). The collaboration involves theoretical and methodological improvement as well as empirical investigations of this relation ship.

In this study we develop and tests a measure of travel-related SWB, the 9-item self-report Satisfaction with Travel Scale (STS). In a survey of 105 undergraduates STS, mood ratings, and ratings of SWB were collected for three hypothetical weekdays differing in travel mode, travel time, access to bus stops, and daily activity agenda. The results showed that STS has an acceptable reliability and differentiates between changes in travel conditions. STS, mood, and to some extent SWB were negatively affected by travel mode (bus vs. car), access to bus stops, and the number of activities in the daily agenda.

Decision utility vs. Experienced utility

Decision utility: expected utility underlying decisions, as derived from discrete choice models.
Experienced utility: utility actually experienced.

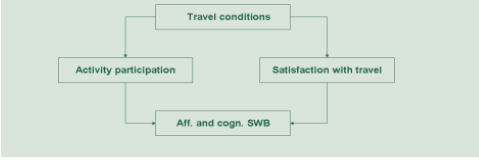
Decision utility and experienced utility may differ considerably, due to incomplete information, constrained choices and mis-prediction of the intensity of emotions. Experienced utility is also referred to as subjective well-being (SWB)



SWB and travel

SWB can be investigated in specific domains (relationships, work, etc.) but also in the context of travel. Insight in the relationship between travel conditions and SWB provides a potentially powerful tool for policy appraisal.

Travel may affect SWB in two ways:
- the direct experience of travel (delays, cleanliness, safety, etc.)
- by facilitating participation in meaningful activities



Satisfaction with travel (STS) scale

To measure travel related SWB, the STS scale was developed in this project. STS includes 6 items to tap emotions as combinations of valence and activation levels, plus 3 items to tap cognitive responses.

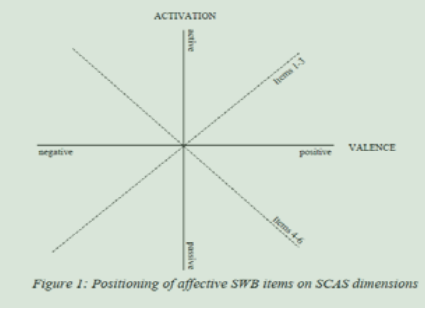


Figure 1: Positioning of affective SWB items on SCAS dimensions

Table 1: The Satisfaction with Travel Scale: End Points of Scales

Positive deactivation-negative activation (items 1-3)	
Hurried	*Relaxed*
Worried	*Confident*
Stressed	*Calm*
Positive activation-negative deactivation (items 4-6)	
Tired	*Alert*
Bored	*Enthusiastic*
Fed up	*Engaged*
Cognitive evaluation (items 7-9)	
Travel was worst I can think of	*Travel was best I can think of*
Travel was low standard	*Travel was high standard*
Travel worked well	*Travel worked poor*

Testing the STS scale

105 undergraduate students from Karlstad University, Sweden, rated 3 activity/travel patterns:
1. Drop off child at day care centre, work, pick up child
2. As 1, but with grocery shopping
3. As 1 but with durable shopping

Across participants, travel mode, in vehicle time and walking times were varried.

Results

Table 4: Mean STS related to travel mode, travel time, walking time, and agenda

Questionnaire version	Agenda 1	Agenda 2	Agenda 3	Mean
Bus, short travel time, high access to bus stops	0.37	-0.07	-0.31	-0.01
Bus, long travel time, high access to bus stops	-0.29	-0.78	-0.96	-0.68
Bus, short travel time, low access to bus stops	-0.61	-1.38	-1.33	-1.11
Bus, long travel time, low access to bus stops	-0.64	-1.34	-0.87	-0.95
Car	0.84	0.23	0.20	0.42
Mean	-0.07	-0.67	-0.65	

STS scale has a high reliability (Cronbach's α):
0.94 (positive deactivation-negative activation)
0.85 (positive activation-negative deactivation)
0.84 (cognitive evaluation).
0.91 (total STS scale)

Average STS scores under different conditions differ in expected ways:
1. Travelling by bus leads to a lower satisfaction with travel (SWT)
2. Shorter walking times lead to lower SWT
3. Higher time pressure and more travel (more activities) lead to lower SWT