Satisfaction with travel, goal achievement, and voluntary behavioral change

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ABSTRACT

The potential effectiveness of soft policy measures aimed at reduced car use depends on how car users experience these. A common measure being implemented is a free monthly travel card valid for a limited period on public transport (PT). In this study, a total of 321 car commuters living in Värmland, Sweden were recruited into such a program. The goal was to use PT between home and work at least three times a week over a period of four weeks. Immediately after completion of the program, the participants answered a follow-up questionnaire. The Satisfaction with Travel Scale (STS) was used to measure their travel experiences. They were also asked to rate their goal achievement. A process model was used during the analyses. Regression analysis showed that the distance from home to the nearest bus stop had a significantly negative effect on the STS. The STS had a significantly positive effect on goal achievement. Both goal achievement and the STS had a significantly positive effect both on PT use and on future goals. This study shows that travel experiences and goal achievement are important for voluntary behavioral change.

KEYWORDS: Satisfaction, Goal setting, Soft policy measures, Test traveler, Public transport

1. Introduction

The problems of increased motorization have been described by many researchers. Several researchers have pointed to increased emissions (Chapman, 2007), increased congestion (Greene & Wegener, 1997), and increased levels of stress among travelers (Novaco & Gonzales, 2009) due to increased car travel. In order to reduce the negative effects of the increasingly accelerating use of private cars, several cities and regions have started to implement hard and soft policy measures. Examples of hard policy measures include changes to infrastructure or road tolls. Hard policy measures have been shown to have the intended effects on car traffic (see, for instance, the effects of road tolls compiled by Li & Hensher, 2012), but these measures are often very costly and not always politically feasible. Examples of soft policy measures include information campaigns, personal travel planning, and travel policies aimed at causing people to voluntarily change their travel behavior. The effects of soft policy measures have been evaluated in terms of changes in the numbers of trips made or how many kilometers the participants have traveled using alternative travel modes (Möser & Bamberg, 2008). In a recent review by Richter, Friman and Gärling (2010), it was concluded that soft transport policy measures are generally effective. Few studies, however, focus on how people voluntarily agreeing to change their mode of travel experience their new way of traveling, or to what extent they succeed in achieving their travel change goals.

Research into consumer behavior (e.g., Oliver, 2010) shows that satisfying experiences are of importance to people's willingness, or intent, to continue using a service or product. Thus, a negative travel experience on PT increases the likelihood of the traveler returning to his/her car. The success of the program is also likely to depend on individual goals. After having set a travel change goal, individuals form implementation intentions entailing commitment to a plan regarding how to attain the goal (Gärling & Fujii, 2002).

The aim of the present research is to examine the relationship between satisfaction with travel, goal-achievement, and future goals. We do this as part of a test traveler program (soft policy measure) whereby car users were given the opportunity to use PT for free for a limited

period.

This article is organized as follows. After briefly reviewing the relevant literature on travel satisfaction, the article discusses a process model for voluntary behavioral change. This is followed by an outline of the method and the data used for analysis. Next, the results of the regression analyses will be discussed. Finally, we will draw some conclusions and discuss some avenues for future research.

2. Review of the relevant literature

Satisfaction with travel has been studied from several different starting points and using different methods. In cost-benefit analysis (based on utility-theory, see McFadden, 2001), the utility or satisfaction is derived from observed choices constituting the actual travel behavior. A recognized problem with this approach, however, is that travel behavior does not always reflect experiences and satisfaction. For instance, traveling by car can be very stressful due to traffic jams while cycling can be very stressful for fear of becoming involved in a traffic accident. Many agree today that experiences, rather than behavior, provide more insight and a competitive advantage for developing travel services that meet the needs of the user.

The focus on travel satisfaction has thus increased during recent years in several ways. One approach is to investigate user satisfaction with different aspects of the service, or overall travel satisfaction (e.g., Eboli & Mazzulla, 2007; del Castillo & Benitez, 2012; Nathanail, 2008). Another angle is to focus on deviating incidents (so-called critical incidents like missing the bus due to a lack of information) and their relationship with travel satisfaction (Friman, Edvardsson, & Gärling, 2001; Friman & Gärling, 2001). Several studies have also begun focusing on activities occurring during the trip and how they affect the travel experience. Undertaking various activities while traveling, like reading or listening to music, can increase satisfaction (Mokhtarian & Salomon, 2001) or counteract boredom (Ettema, Friman, Gärling, Olsson, & Fujii, 2012).

In-depth studies of people’s travel experiences can benefit from theories of what determines people's satisfaction and wellbeing in life. Cognitive as well as affective factors are

important with regard to how we feel right know, as well as for how we feel about life in general (Diener et al. 1985). Ettema et al. (2011) have taken note of this and developed a measurement instrument (the Satisfaction with Travel Scale) that includes cognitive and affective travel experiences. Specifically, this measure combines cognitive judgments (quality of service) with measures of affect, the latter being divided into two dimensions with one focusing on positive activation (e.g., enthusiasm–boredom) and the other on positive deactivation (e.g., hurried–relaxed). Several studies have validated the instrument in its ability to measure car users', PT users', and cyclists' travel experiences (see for instance Friman, Fujii, Ettema, Gärling, & Olsson, 2013). In addition to measuring travel experiences, it has also been used to study the extent to which commuting affects life satisfaction in general (Olsson, Gärling, Ettema, Friman, & Fujii, 2013). This proven link makes the instrument particularly useful for policy changes since the aim should be to maintain or, if possible, increase citizens' life satisfaction.

In this study, we will focus on car users who voluntarily agreed to change their travel behavior. In light of previous research, travel change goals were formulated within the implemented soft policy program. In previous studies, behavioral plans and change goals have already proven efficient as methods of reducing car use (e.g., Fujii & Taniguchi, 2005). In addition to previous research, we will focus in this study on the relationship between travel satisfaction and goal achievement. Taniguchi and Fujii (2007) presented a process model showing that the reduction in car use is influenced by psychological factors, which are in turn influenced by environmental factors. This psychological relationship was applied to the present study with the addition that goal achievement would predict whether or not a future goal is formulated (see Figure 1).

Insert Figure 1

3. Method

3.1 Participants

A mobility survey was conducted at three workplaces in a Swedish medium-sized region

(population 310 914). All the employees (8705) were asked about their travel habits. In the mobility survey, they were also asked to indicate whether or not they were interested in participating in a test traveler program. Among those who signed up for the program (23%), people who travelled alone to work by car three days a week or more were chosen. As a result three hundred and twenty-one people participated in the program with the aim of reducing their car use to commute. The participants were offered a free monthly travel card valid on PT for four weeks (corresponding to 135 Euro). During the test period, the participants agreed to use PT between home and work at least three times a week. Of the total number of participants (321), 259 answered the follow-up survey in October 2012, which is analyzed in this study.

3.2 Procedure

A survey questionnaire was then administered using a web-based interface. A list of the email addresses of the employees who were included in the test traveler program was used to send out emails. A web link to the survey and a cover letter signed by a representative of the participating company were attached. An initial reminder was emailed after a few days and a second reminder after a week. It was possible to answer the questionnaire over a two-week period.

3.3 Questionnaire

The questionnaire consisted of four parts. Questions aimed at describing reasons for participating in the test traveler program were asked in the first part. It was possible to choose several reasons from a list of nine which included “nothing/don’t know”. The three most common reasons for participation were (1) that it was free of charge, (2) environmental reasons and (3) a whillingnes to change travel habits.

The second part asked the respondents to answer questions about progress toward their goals. Questions were asked about achieving, or exceeding, their initial commitment (three trips per week). Participants exceeding their goals were asked to specify their travel change goals prior to the test period. All the participants were asked about outcome. Outcome was ranked on a scale

from 3-4 trips per week to over 11 trips per week (see Table 1). In the analysis, “0” indicated that the goal had neither been achieved nor exceeded, while “1” indicated that the goal had either been achieved or exceeded. Two questions were aimed at describing reasons for achieving or not achieving initial goals. It was possible to choose several reasons from predefined lists. These reasons are reported in Figure 2.

In the third part, the Satisfaction with Travel Scale (STS) was applied (Ettema, et al., 2011). The STS consists of nine items which are all rated on seven-point bipolar scales, whereby a positive score coincides with both a positive affective experience and a higher quality experience, and a negative score coincides with both a negative affective experience and a lower quality experience. The items are as follows: commuting by PT was the worst/best thing I can think of, it had a very low/very high standard, it worked very well/very poorly, I felt very hurried/very relaxed, very stressed/very calm, very worried/very confident, I felt very tired/very alert, very bored/very enthusiastic, and very fed up/very engaged. As mentioned in Table 1, Cronbach's alpha was high level (= 0.839), and the coefficient of correlations (r square) between the three components exceeded 0.60. Thus an STS Index was calculated by averaging across the scales.

In the fourth part, the participants were asked questions about their future goals as regards commuting by PT after the test program. “What is your future goal as regards your commute by PT?” The scale used specified the number of trips per week, but they could also choose three other options: for instance will be more aware and choose PT whenever possible, will not use PT at all, and do not know. In the analysis, "will not use PT at all" was coded as 0 and a specified travel goal (including “will use whenever possible”) was coded as "1". One question was asked about whether or not the test traveler program would affect their travel mode choice for other types of trips (leisure and business).

Background data was collected from the mobility survey. This included gender, age, frequency of PT use, distance to work, distance to the nearest bus stop, and frequency of commutes during a working day (Table 1). The last three variables were measured using

categorical data and were thus transformed into continuous data prior to analysis. An average of the distance (kilometers) and the frequency of trips (within a weekday/month) was used during analysis (all data transformations are specified in Table 1).

Insert Table 1

4. Results

4.1 Sample description

A sample description is given in Table 2. As can be seen, a majority of the participants had more than 5 km from home to work and undertook a number of trips during a regular work day.

Insert Table 2

4.2 Goal achievement and future goals

Thirty percent (78 participants) formulated higher goals than required by the program. Fifty-one percent (n=117 participants) reported not achieving their initial goals within the program, while forty-nine percent (113 participants) either achieved or exceeded their goals. In total, 313 reasons were given for achieving initial goals (see Figure 2). Common reasons for success included good connections and the fact that PT was easy and convenient to use. Participants not achieving their initial goals gave 256 reasons for this (see Figure 3). Common reasons reported included no suitable connection being found, shiftwork, and illness.

Of the total number achieving their goals, almost all formulated a future goal (89.4%) of using PT to commute to work. Of the total number not achieving their goals, 66.4% still formulated a future goal of using PT to commute to work. Nineteen percent of the participants taking part in the program did not set any future goals for their commute to work using PT.

Insert Figure 2

Insert Figure 3

4.3 Travel satisfaction, goal achievement, and behavioral change

An index of satisfaction with the work commute was formed by averaging across all nine STS scales. Two logistic and two multiple regression analyses were performed in order to determine the influences of environmental and psychological factors on travel behavior and on achieved and future goals (see Figure 1). Gender and age had no significant effect on the included variables in the process modell and were therefore not included in the analyses. The distance from home to work, the distance from home to the nearest bus stop, and the frequency of trips within a working day were defined as environmental factors. This is illustrated in Figure 4, which also includes all the significant paths from the analyses. The regression coefficient for the distance from home to the nearest bus stop had a significantly negative effect on satisfaction with travel (see also the complete results for all variables included in the analyses in Table 3). The longer the distance was to the bus stop - the more dissatisfied were the participants. Satisfaction with travel had a significantly positive effect on the frequency of PT use. The more satisfied the participants were with their travel experience - the more they tended to use PT for their work commute. Furthermore, the more frequently the participants used PT for their work commute, the likelier it was for them to achieve their travel change goal (goal achievement). Achieving or exceeding travel change goals had a positively significant effect on formulating future goals for the work commute using PT. Satisfaction also had a significantly positive direct effect on future goals of using PT to commute to work. A satisfying experience increased the likelihood of the participants wanting to set future goals for their work commute using PT.

Insert Figure 4

Insert Table 3

5. Discussion

Understanding which factors determine whether people succeed or fail in changing their travel behavior is of fundamental concern in applied transport psychology. The question asked in this study was whether or not travel satisfaction is important in goal achievement and future use of PT. Test travelers' programs are a popular soft policy measure and their implementation is

becoming increasingly frequent in Sweden. Getting car users to try PT for a limited time can change attitudes when the benefits of PT use are discovered (Fujii, Gärling, & Kitamura, 2001; Pedersen, Friman, & Kristensson, 2011). However, for greater success, these programs should be monitored and implemented with the support of research. Following and evaluating these programs is one step in the development of future evidence-based programs.

Previous research has shown the importance of travel plans and travel change goals for the success of soft policy measures. One question concerns how travel change goals should be formulated to bring efficiency to travel behavior change. In this program, participants faced a minimum travel change goal in accepting to participate in the program. Several participants adopted this goal while others formulated even higher travel change goals regarding their participation in the program. Theories of motivation converge on the idea that setting a behavioral goal is a key act that promotes goal achievement (e.g., Ajzen, 1991; Carver & Scheier, 1998). In line with this, the results show that nearly half (49%) of the participants lived up to their travel change goals. This is an improvement on programs not requiring a specified travel change goal, where the expected behavioral change is in the order of 5-20% (Richter, Friman, & Gärling, 2010).

Half of the participants failed to live up to their travel change goals. One reason for this was the lack of suitable connections. Thus, we conclude that recruitment to test traveler program is important. Money should not be spent on participants who have no real possibility of changing their travel behavior. However, it may also be the case that the participants were not good at planning their work trips. A weakness of this program was that the set travel change goals were not followed up with individual behavioral travel change plans. Setting a travel change goal does not always translate successfully into changed travel behavior, which is the main finding of this study. Commitment to attaining a goal will not necessarily prepare people for dealing effectively with the self-regulation problems (e.g., planning how to achieve a goal or getting started) of goal attainment (Gollwitzer & Sheeran, 2006). Goal attainment could benefit from the formation of a travel plan focusing on the enactment of the travel change goal. Taking advantage of ongoing

technological developments may be one way of facilitating the implementation of travel plans (e.g., an app which reminds you to take the bus or to say no to a car trip, and which checks that you actually did use the bus). Exactly how this should be designed for maximum behavioral change could be an area for further research.

The process model of voluntary behavioral travel change shows that travel satisfaction increases the level of PT use, enabling a higher degree of goal achievement. What could be done then to increase travel satisfaction with PT? Even though few environmental factors were included in this study, the results are in line with several other studies (e.g., Eriksson, Friman, & Gärling, 2008; Stradling et al., 2005) which show that the distance to the nearest bus stop is an important factor. If this relationship is linear or if there is important step changes remains to be investigated in future studies. Physically moving bus stops closer to home is a problem, however, since this will cause longer routes in conjunction with an increased number of stops. The objective distance to a bus stop must therefore be related to the total travel time using PT. We propose a research area for the future that focuses on minimizing perceived distance and thus increases the perceived availability of PT.

Goal achievement increases the likelihood of the continued use of PT in the future for commuting to work. Furthermore, the participants achieving their travel change goals formulated new goals to a greater extent for their future work commute using PT. A formulated future goal is a goal intention or a self-instruction to use PT, thus increasing the likelihood of the participants actually doing so. Future research could follow up these results and investigate the relationship between goal intention and the actual outcome sometime after the program has ended.

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Figure captions

Figure 1. Process model of voluntary behavioral change

Figure 2. Reasons for succeeding in the initial goal (313 reasons)

Figure 3. Reasons for failing in the initial goal (250 reasons)

Figure 4. Result of hierarchical multiple and logistic regression analysis

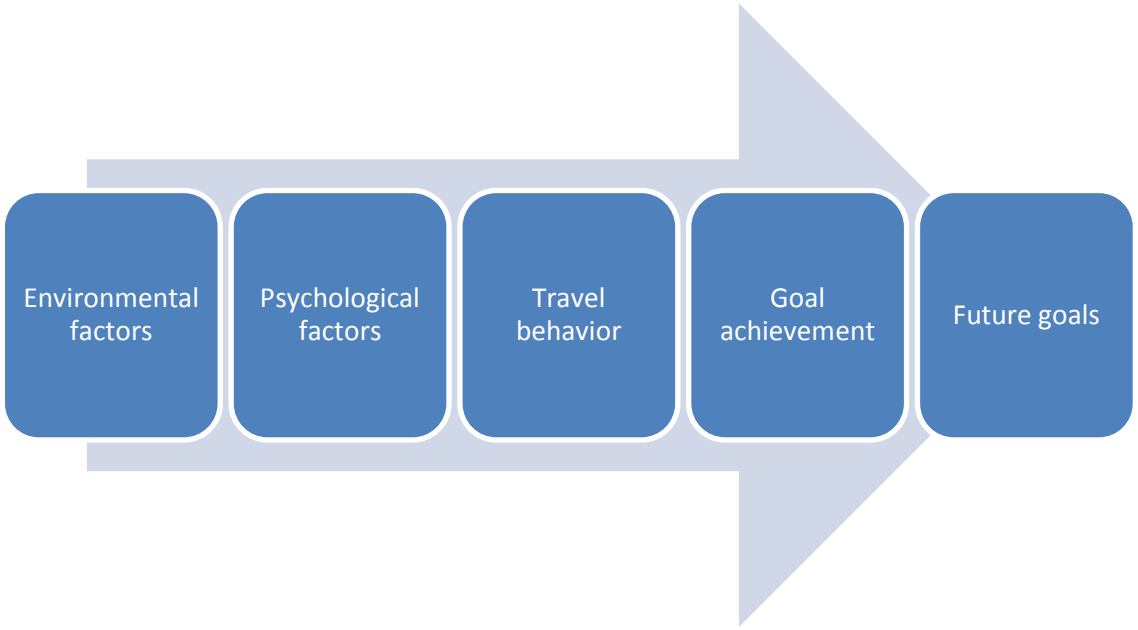
Environmental factors
Psychological factors
Travel behavior
Goal achievement
Future goals

Figure 1.

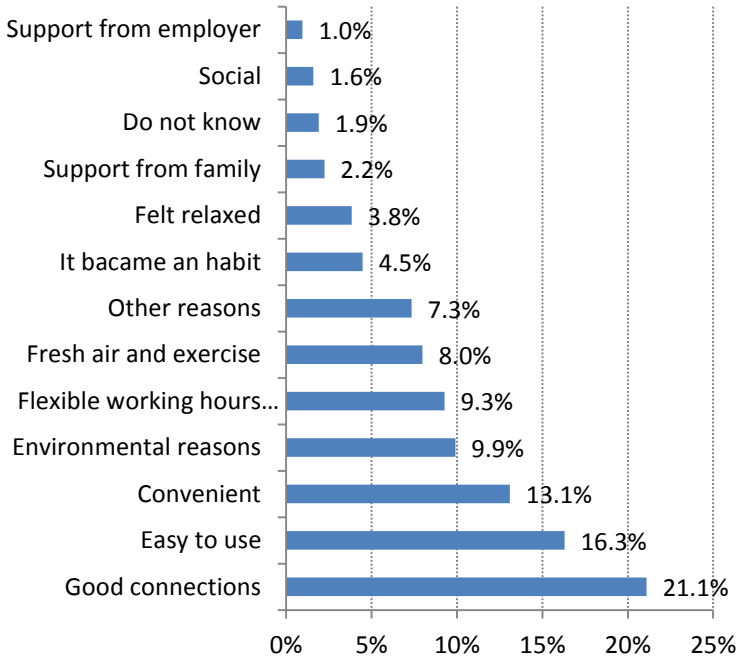
Support from employer
1.0%
Social
1.6%
Do not know
1.9%
Support from family
2.2%
Felt relaxed
3.8%
It bacame an habit
4.5%
Other reasons
7.3%
Fresh air and exercise
8.0%
Flexible working hours…
9.3%
Environmental reasons
9.9%
Convenient
13.1%
Easy to use
16.3%
Good connections
21.1%
0%
5%
10%
15%
20%
25%

Figure 2.

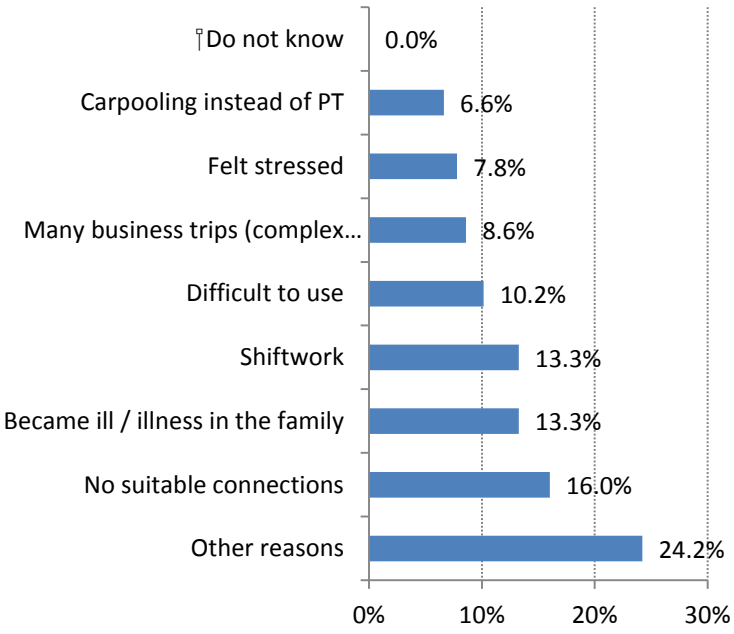
Do not know
0.0%
Carpooling instead of PT
6.6%
Felt stressed
7.8%
Many business trips (complex...
8.6%
Difficult to use
10.2%
Shiftwork
13.3%
Became ill / illness in the family
13.3%
No suitable connections
16.0%
Other reasons
24.2%
0%
10%
20%
30%

Figure 3.

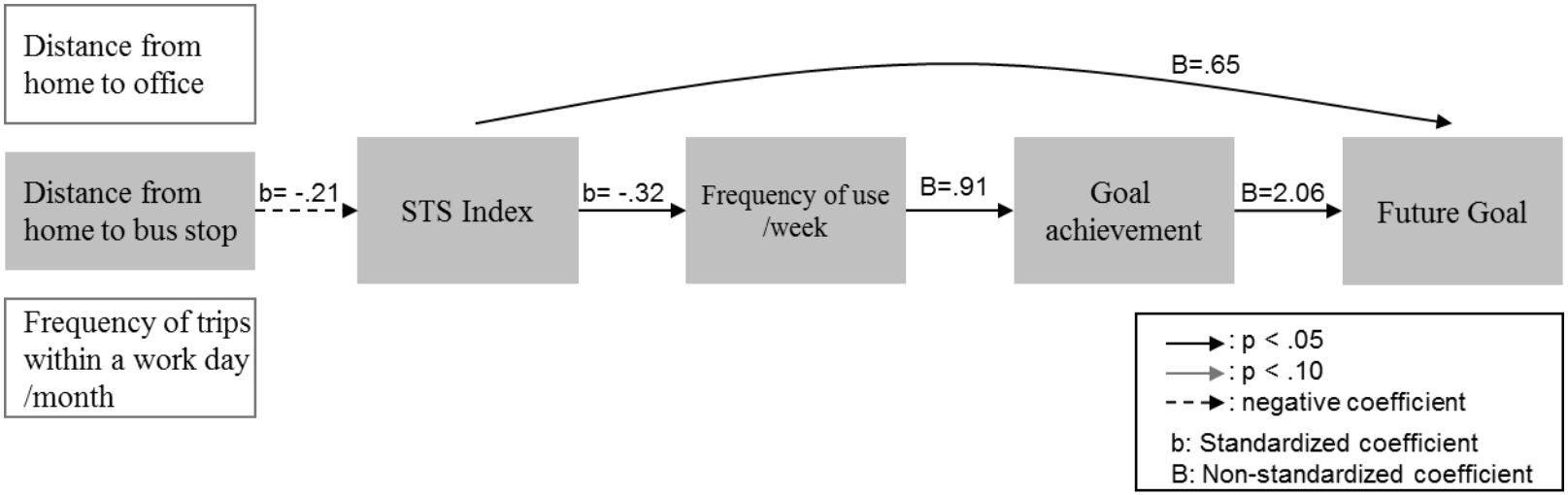
Distance from home to office
Distance from home to bus stop
Frequency of trips within a work day /month
b= -.21
STS Index
b= -.32
Frequency of use /week
B=.91
Goal achievement
B=2.06
Future Goal
B=.65
: p < .05
: p < .10
: negative coefficient
b: Standardized coefficient
B: Non-standardized coefficient

Figure 4.

Table 1. Data transformations

Subject	Question	Scale	Transformation
Distance	How far is it from your home to work? Enter the number of kilometers one way.	Km	-
Distance	Estimate the distance from home to the bus stop you choose/can choose in order to travel to work.	1) 0 - 200 m 2) 201-500 m 3) 501-1000 m 4) 1.1 km -3 km 5) More than 3 km 6) Do not know	1) 0.10 km* 2) 0.35 km 3) 0.75 km 4) 2.00 km 5) 5.00 km 6) Missing
Frequency of trips	In general, how frequently do you need to travel within a distance of five kilometers?	1). More than 5 times/week 2) 2-5 times / week 3) 3-5 times / month 4) 1-2 times / month 5) 1-2 times / year 6) Never	1) 20 times/month** 2) 14 times/month 3) 4 times/month 4) 1.5 times/month 5) 0.04 times/month 6) 0 times/month
Satisfaction with travel (STS)	Very tired - very alert Very bored-very enthusiastic Very fed up-very engaged Very hurried-very relaxed Very worried-very confident Very stressed-very calm Worst I thing can think of-best thing I can think of Very low standard-very high standard Worked very poorly-worked very well	-3 to +3 (7 point scale)	The scale was converted from "-3 to +3" to "1 to 7". Cronbach's alpha = 0.839 STS Index = summery of scales/9 scales
Goal achievement	Did you achieve or exceed your travel change goals?	1) Yes 2) No	1) 1 2) 0
Frequency of PT use per week	In general, what was the outcome of your work journeys by PT?	1) No trip 2) 1-2 trips/week 3) 3-4 trips/week 4) 5-6 trips/week 5) 7-8 trips/ week 6) 9-10 trips/week 7) 11 trips or more/ week 8) Other... 9) Do not know	1) 0 trips per week*** 2) 1.5 trips per week 3) 3.5 trips per week 4) 5.5 trips per week 5) 7.5 trips per week 6) 9.5 trips per week 7) 11.5 trips per week 8) Missing 9) Missing
Future goal	What is your future goal as regards your commute by PT?	1) 1-2 trips /week 2) 3-4 trips /week 3) 5-6 trips /week 4) 7-8 trips /week 5) 9-10 trips/week 6) 11 trips or more/week 7) Be more aware and choose whenever possible 8) Never 9) Other... 10) Do not know	1) 1**** 2) 1 3) 1 4) 1 5) 1 6) 1 7) 1 8) 0 9) Missing 10) Missing

=** The scale was transformed to kilometers and the middle point on each scale level was used in the analyses. **= The scale was transformed to months and the middle point on each scale level was used in the analyses. *** The middle point on each scale level was used in the analyses. *=1 denotes "yes, there is a future goal" and 0 denotes "no, there is no future goal".

Table 2. Sample descriptives (total sample)

Background factor	N	Percent
Gender	254	
Female		80.7
age (years)	232	
<36		14.7
36 – 45		24.1
46-55		35.3
> 55		25.9
Distance from home to work (km)	219	
< 3.0		3.2
3.0 - 5.0		4.6
5.1 - 15.0		49.3
> 15.0		42.9
Distance from Home to bus stop	230	
0-200m		22.6
201-500m		24.3
501-1000m		21.3
1.1km-3km		12.2
More than 3km		19.6
Frequency of trips (reasons to travel) within a working day	232	
Never		21.1
1-2 times / year		13.4
1-2 times / month		25.0
3-5 times / month		19.4
2-5 times / week		12.1
More than five times / week		9.1
Frequency of PT use	232	
Never		13.4
1-2 trips / week		20.3
3-4 trips / week		32.8
5-6 trips / week		13.8
7-8 trips / week		10.8
9-10 trips / week		7.3
more than 11 trips / week		1.7

Table 3. Results of multiple and logistic regression analyses

		Dependent variables											
		STS index (multiple linear regression)			Goal achievement (binary logistic regression / step-up procedure)			Frequency of PT use (multiple linear regression)			Future goal (binary logistic regression / step-up procedure)		
		b	t	p	B	w	p	b	t	p	B	w	p
Independent variables	Distance from home to work (km)	0,04	0,53	,600	-	-	-	0,04	0,66	,511	-	-	-
	Distance from home to bus stop (km)	-0,21	-2,79	,006	-	-	-	-0,03	-0,43	,666	-	-	-
	Frequency of trips within a work day per month	-0,01	-0,10	,919	-	-	-	0,07	1,21	,229	-	-	-
	STS Index				0,15	9,02	,003	0,18	3,06	,003	0,65	16,98	,000
	Goal achievement							0,61	10,41	,000	2,06	11,28	,001
	Frequency of PT use per week										-	-	-
	Constant term†	14,11	42,70	< .001	-2,15	8,87	,003	-0,35	-0,43	,670	-7,84	14,82	,000
	Goodness of fit, Number of samples(n)	R2 = 0.04; n = 195			r^2 = 0.05; n = 195			R2 = 0.46; n = 175			r^2 = 0.31; n = 138		
	†: Non-standardized coefficient is described in column b, b= Standardized coefficient, B= Non-standardized coefficient, t= t value, p= p value, w= wald statistics value												