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Review of
"Subjective well-being related to satisfaction with daily travel"

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0. Terminology, definitions
Others

0-1. Terminology

Term	Outline	Others
Health	"Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.	Definition by WHO
Well-being	**A state of** happiness and fulfillment in all aspects of life: physical, mental, and social	Using this icon →
Satisfaction	**Fulfilment** of one's wishes, expectations, or needs, or the **pleasure** derived from this.	Using this icon →

- **Positive emotions**
- **Motivation and immersion**
- **Awareness of self**
- **Mindfulness** ←-------------- **Similar** --------------→
- **Psychological resistance/resilience**
- **Empathy**
- **Compassion and altruistic behavior**

Well-being

Satisfaction

0-2. Definitions

Term		Contents	Ebata's opinion
Subjective Well-Being : SWB)		■**No definition of "happiness" at all** ■Answer "How happy do you feel about yourself" → Clarification ■Hence, the "survey" is the main focus.	**No concept of "happiness that can be compared to others"**
Two SWBs	**(A)Cognitive SWB**	■**Based on an individual's (self-imposed) assessment of well-being** ■**Also known as "life satisfaction"** ■Self-evaluations of other specific domains of life in general, such as work, consumption, health, relationships with family and friends, and leisure time (**domain-specific SWB**).	**Personal "happiness" based on the "rules of your own happiness"**
	(B)Affective SWB	■**Positive emotions** of joy, fulfillment, enjoyment ■**Negative emotions** such as sadness, anger, disappointment ■**Response portion of the individual** as determined from the above multidimensional	Happiness" based on feelings that arise spontaneously inside you, **non-logically, without even rules** within you.

0-3. Icons using this presentation

Term	Icon
Satisfaction with performance	
Satisfaction with daily travel	
Satisfaction with daily Life	
Out-of-home Activities	

Term	Icon
Cognitive SWB	
Affective SWB	
Joy, fulfillment, enjoyment	
Sadness, anger, disappointment	

0-0. Terminology　(for Ebata's only)

用語		内容	江端式解釈
主観的幸福(Subjective Well-Being：SWB)		■**"幸福"を一切定義しない→どのような定義も採用しない** ■「自分自身どの程度幸福だと感じているか」と応答することで、明示化される ■故に「アンケート」がメインとなる。	**「他人と比較できる幸福」の概念が、どこにもない**
2つの SWB	(A)認知的幸福 (Cognitive SWB)	■**個人が(勝手に)持っている何らかの、基準に基づき(勝手に)比較して判断する**幸福への**自己評価** ■**「生活満足感」「人生の満足感」**とも言われる ■仕事，消費，健康，家族・友人との関係，余暇など生活に関わる**他の特定領域全般への自己評価**もある（特定領域 SWB）	**自分の中で勝手に作り上げた「自分幸福ルール」**に基づいて判断した、自分だけの「幸福」 多分、**承認欲求**による幸福が、これに該当すると思う
	(B)感情的幸福 (Emotional SWB)	■喜びや充足感，楽しさ**肯定的感情の存在** ■悲しみ，怒り，失望などの**否定的感情の不在** ■上記の多次元から判断される**個人の感情反応部分**に該当	自分の中にルールすらなく、**非ロジカル的に、自分の内面に自然発生した感情**に基づく「幸福」

Ebata's memorandum

第 1 図　移動と SWB の関係性の概念図 1 : Ettema et al.（2010）
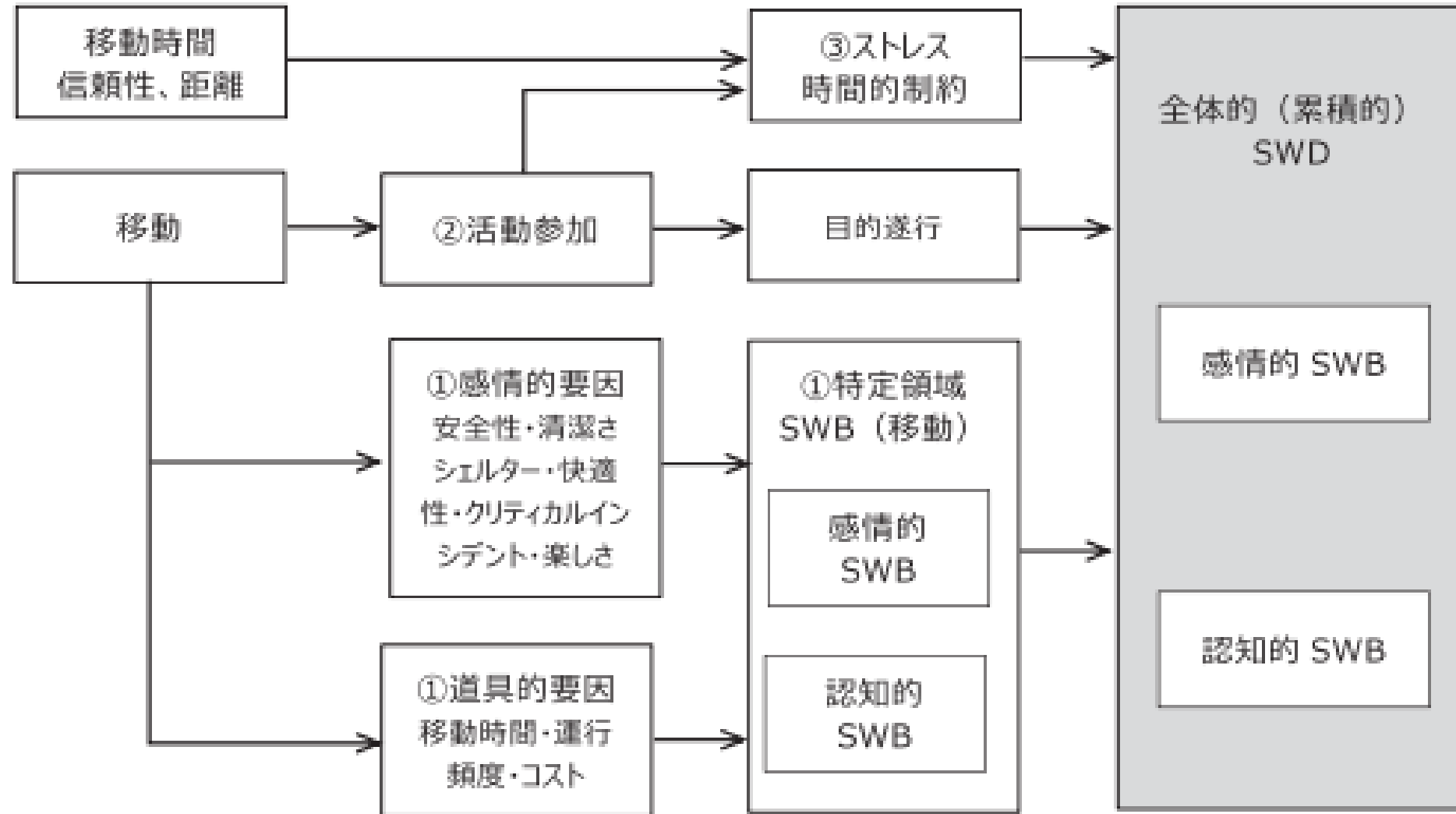
1. Overviews

1. Background
(1)Many previous studies show

Out-of-home Activities → **affect** → Subject Well-Being (SWB)
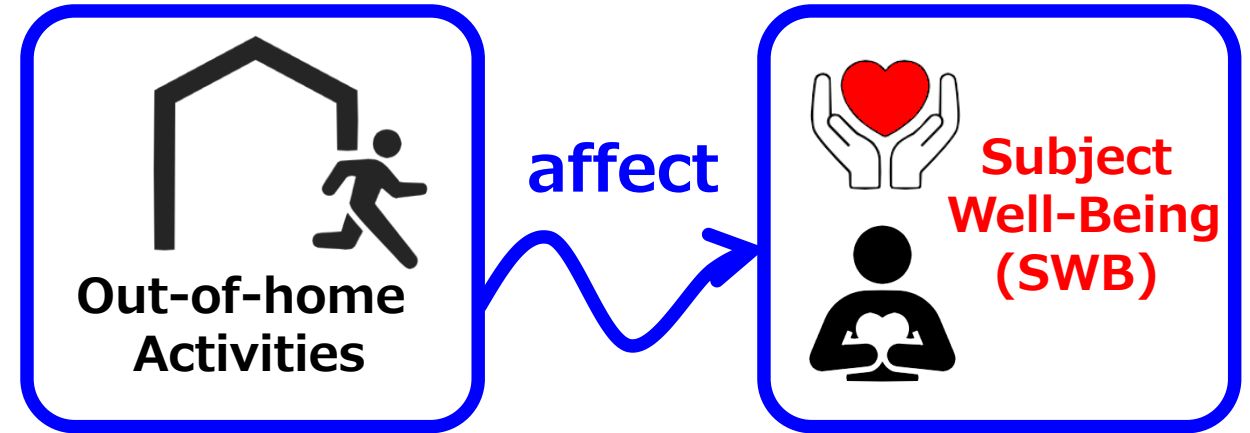
2. Purpose of this study
(1) "Daily travel" increases SWB?

Increase?
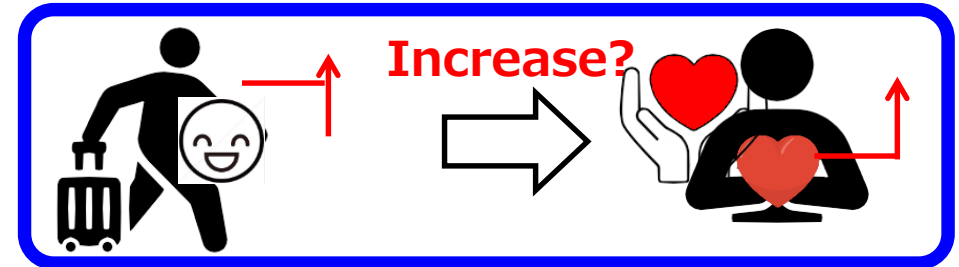
(2) Which car usage maximizes SWB?

Emotional
Instrumental
Which is Bigger?
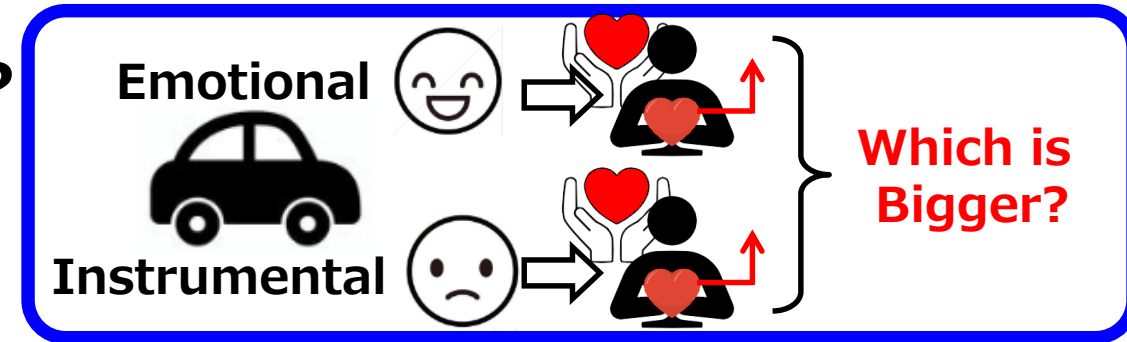
A Power Word "SWB(Subject Well-Being)" in this paper

3. Objects (Targets)
1330 persons in Sweden
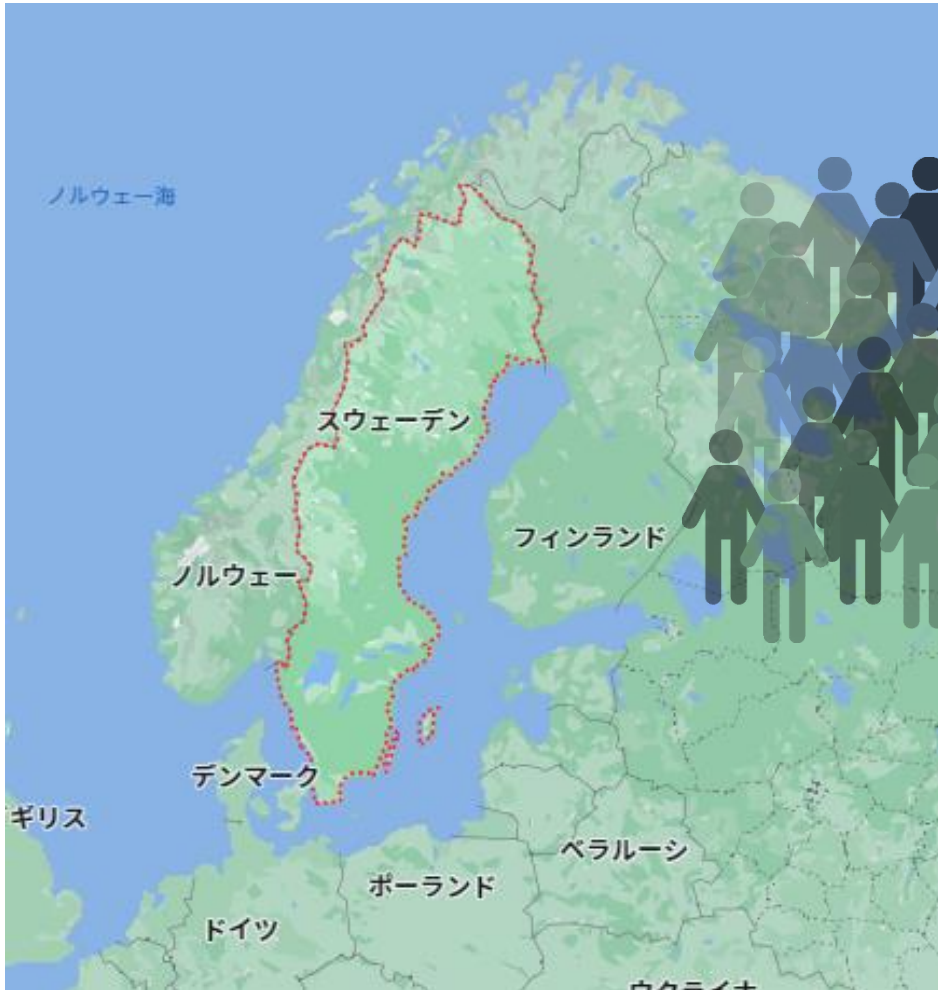
(1)Car access and use

(2)Satisfaction with daily travel

(3)Satisfaction with performance of out-of-home routine activities

(4)Affective and cognitive SWB

4. Results
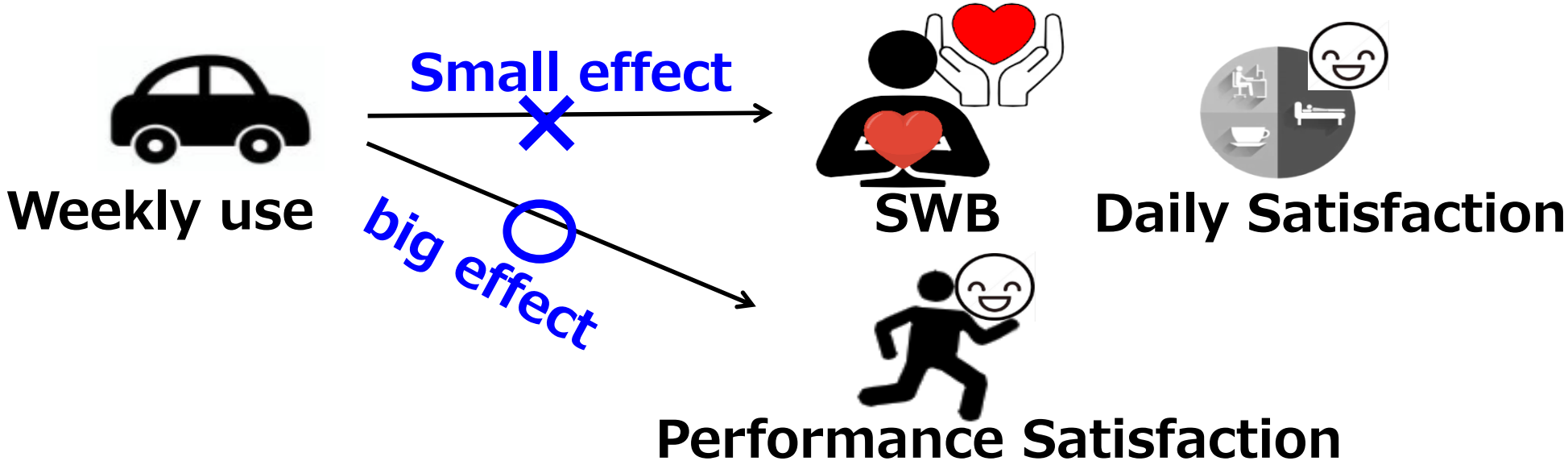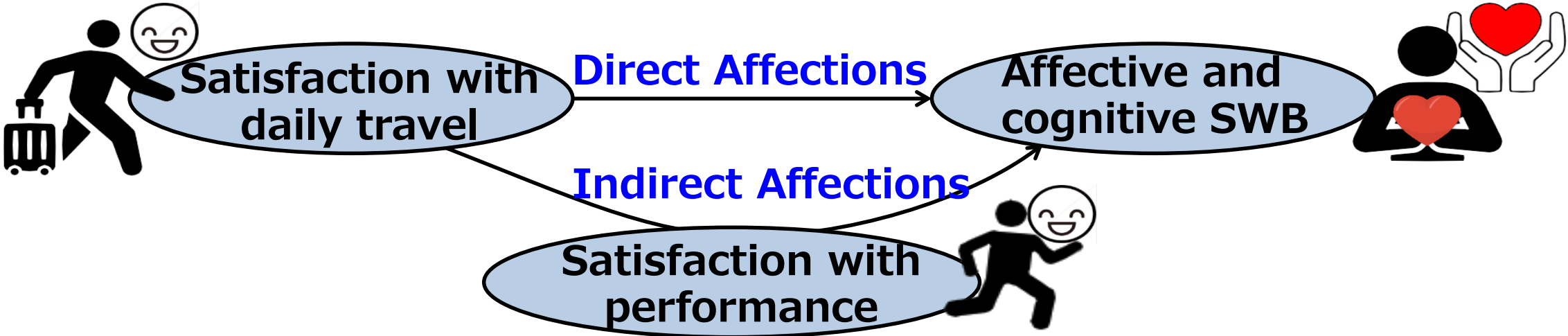
2. Literature review

From Utility-Maximization to SWB

Paper	Outline	Others
McFadden 2001	**Utility-maximization theory** is the dominant account of how travel-related choices of activity	Doubtful whether utility derived in this way is a valid **measure of travellers' satisfaction**
Kahneman 1999	**Subjective well-being (SWB)** has been proposed as a measure of individuals' benefits in a number of domains	SWB started from the paper.
Diener and Suh 1997	SWB expresses individuals' **cognitive and affective** well-being, directly measured by means of reliable psychometric scales	
Diener and Seligman 2004; Diener et al.2009	SWB refers to **overall life satisfaction**, which is relatively stable over time	Growing interest in understanding how SWB is affected
Ettema (2010)	Study of **changes in SWBs** from **changes in modes** of travel and public transportation service levels.	SWBs may find a relationship with the **travel context.**

Extract Cognitive SWB from SWB

Paper	Outline	Others
Diener (1985)	SWB is assumed to consist of **(1)positive affect (PA)** and **(2)negative affect (NA)** from direct experience, and **the (3)cognitive component** of satisfaction with life as a whole	
Stone (1999)	Emotional components (PA and NA) may be assessed by **immediate self-report of specific emotions and moods**	
Kahneman(2004) Schwartz(2009)	Assessments from memory of emotions associated with recent activity were highly correlated with **the results of the immediate method**	Measure past emotional SWB (e.g., how you felt last week, how you feel overall) or current mood (how you feel now)
Diener(1985) Pavot & Diener (1993)	**Cognitive SWB** is assessed by a 5-item life satisfaction scale.	

2-3. Literature review(3)

Miscellaneous info. about SWB

Miscellaneous
(1)**Both affective and cognitive SWB** are stable and probably genetically influenced
(2)Performance on goal-related activities, **positive living** environment, and **higher income** have higher SWB
(3)SWB does **not increase in proportion to income growth** over time
(4)SWB usually has a **U-shaped relationship with age**, being **lowest around age 40** and gradually increasing thereafter.
(5)**Marriage** tends to increase SWB, while **divorce and death** of a spouse decrease SWB
(6)**Unemployment** has been shown to decrease SWB, especially when there is little social support
(7)Results regarding gender are mixed. In some studies, **women** have higher SWB than men, in others there is **no difference**, and in still others gender differences vary by life course
(8)It can also be defined in the context of specific domains such as **work life, family life, leisure time**, etc.
(9)Customer satisfaction is **less general than the domain-specific SWB** and applies only to those who use the service.

Travellers' satisfaction is influenced by events

Events during travel

affect

Friman and Ga¨rling (2001) and Friman et al. (1998, 2001)

Critical incidents

affect

Loop

Friman（2004）

Mokhtarian and Salomon 2001; Mokhtarian et al.

Jakobsson Bergstad （2010）Steg（2005）

Cleanliness,
Privacy,
Safety,
Convenience,
Stress,
Social interaction,
Scenery

Bus environments

affect

affect

Walker

congestion, air quality, presence of trees and flowers, presence of beggars, type of pavement
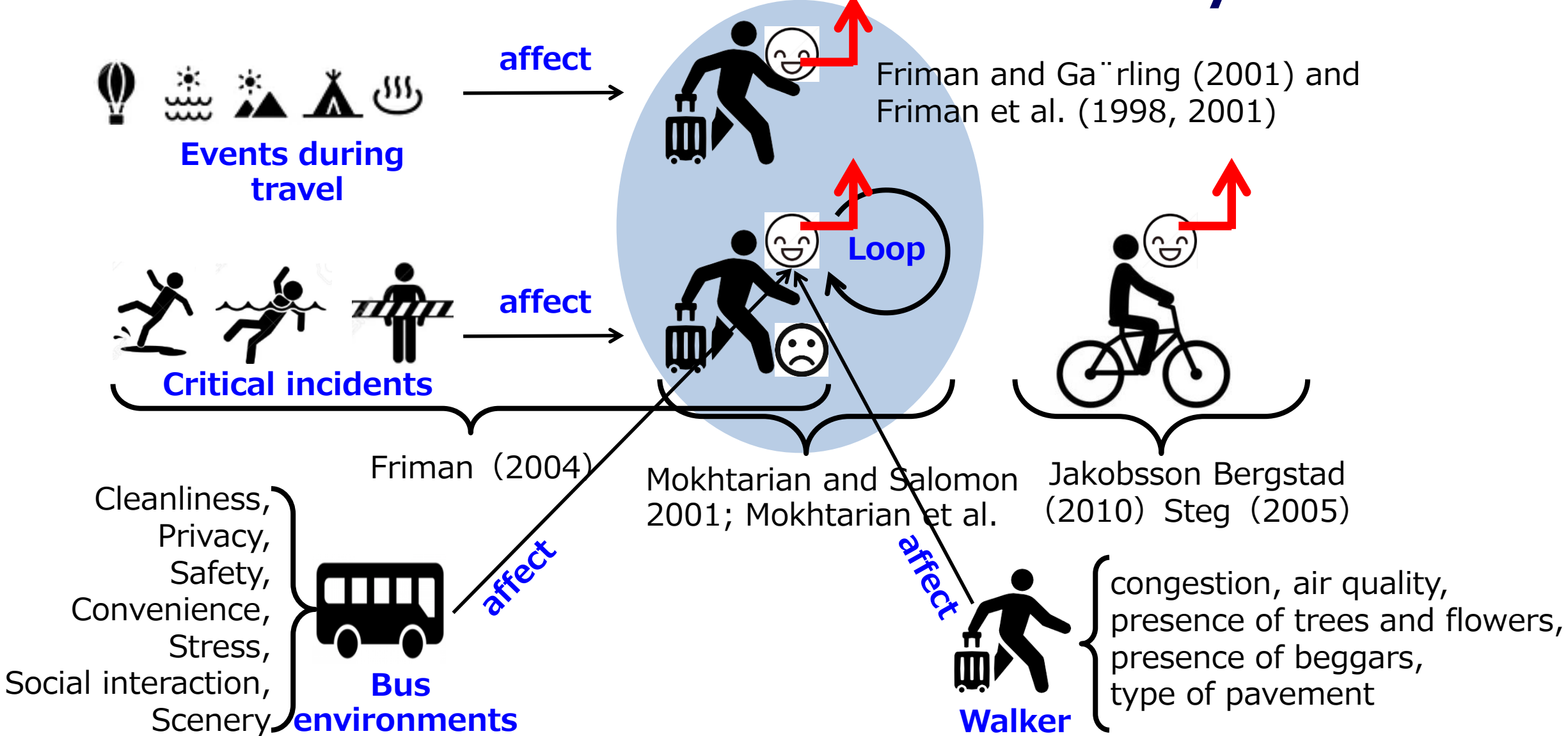
Daily travel itself lead to cumulative satisfaction

Satisfaction with daily travel → **Relate** → **SWB** （Schimmack 2008）

Activities in travel → **Relate** → **Activities in Dairy life** （Ha¨gerstrand 1970）

Different Means of transportation { bus, bicycle, car } → **Relate** / **Relate** / **Relate** → **Different SWB**
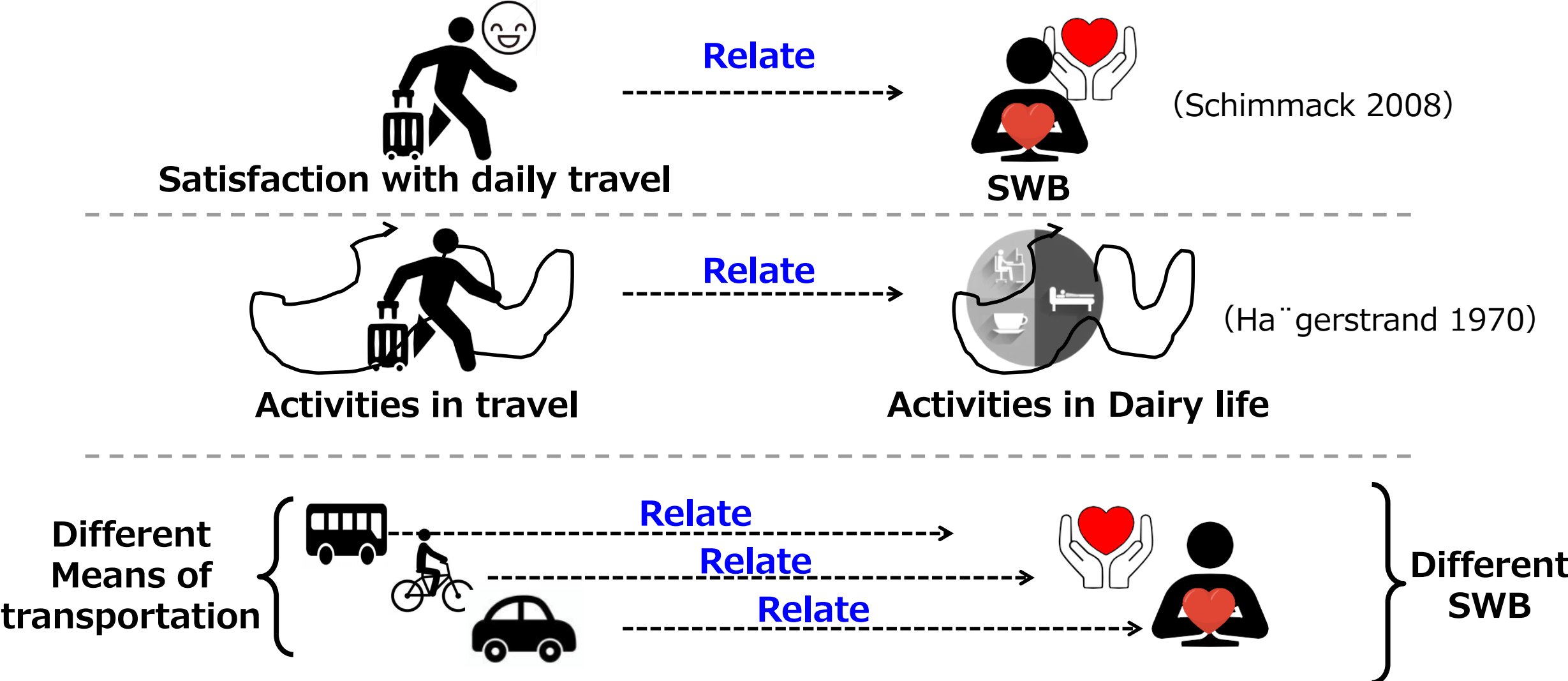
3. Method

3-1. Sample, Procedure and Questionnaire

Over 20 millions (urban areas)

Over 2 millions (semi-rural area)

Less 2 millions (farming area)

1000

1000

1000

196

536

543
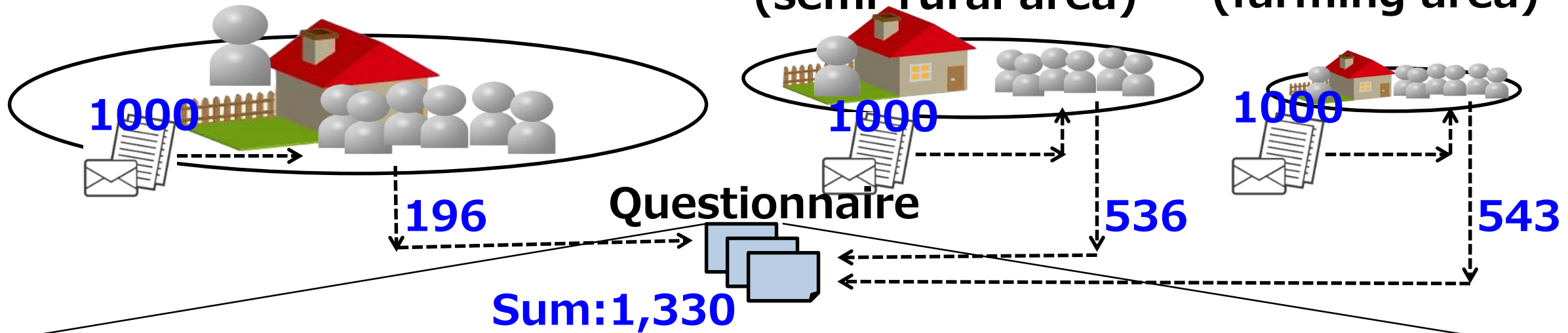
Questionnaire

Sum:1,330

(1) Questions about **instrumental, affective, and symbolic motives** for car use
(2) Questions about **daily travel**
(3) Questions about the **frequency of performing out-of-home activities** and **choice of travel mode for performing these activities**
(4) Questions about affect **associated with performing the activities**;
(5) Measures of **affective SWB**;
(6) Measures of **cognitive SWB**,
(7) Questions about **socio-demographic variables** including sex, age, education, income, employment, household type, housing conditions, and car access and use.

Developed the Travel Satisfaction Scale (STS) to measure satisfaction with daily travel

■ **STS: Factor Analysis and Principal Component Analysis with varimax rotation**

⇩

Extracting five parameters

⇩
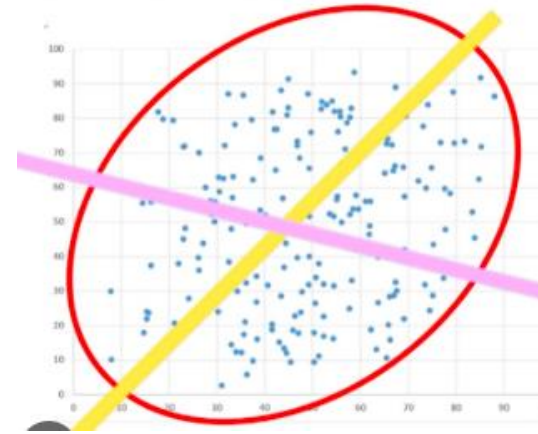
(1)Draw the axis at the widest point → maximum dispersion

(2) Draw orthogonal lines

⇩

Shrink parameters

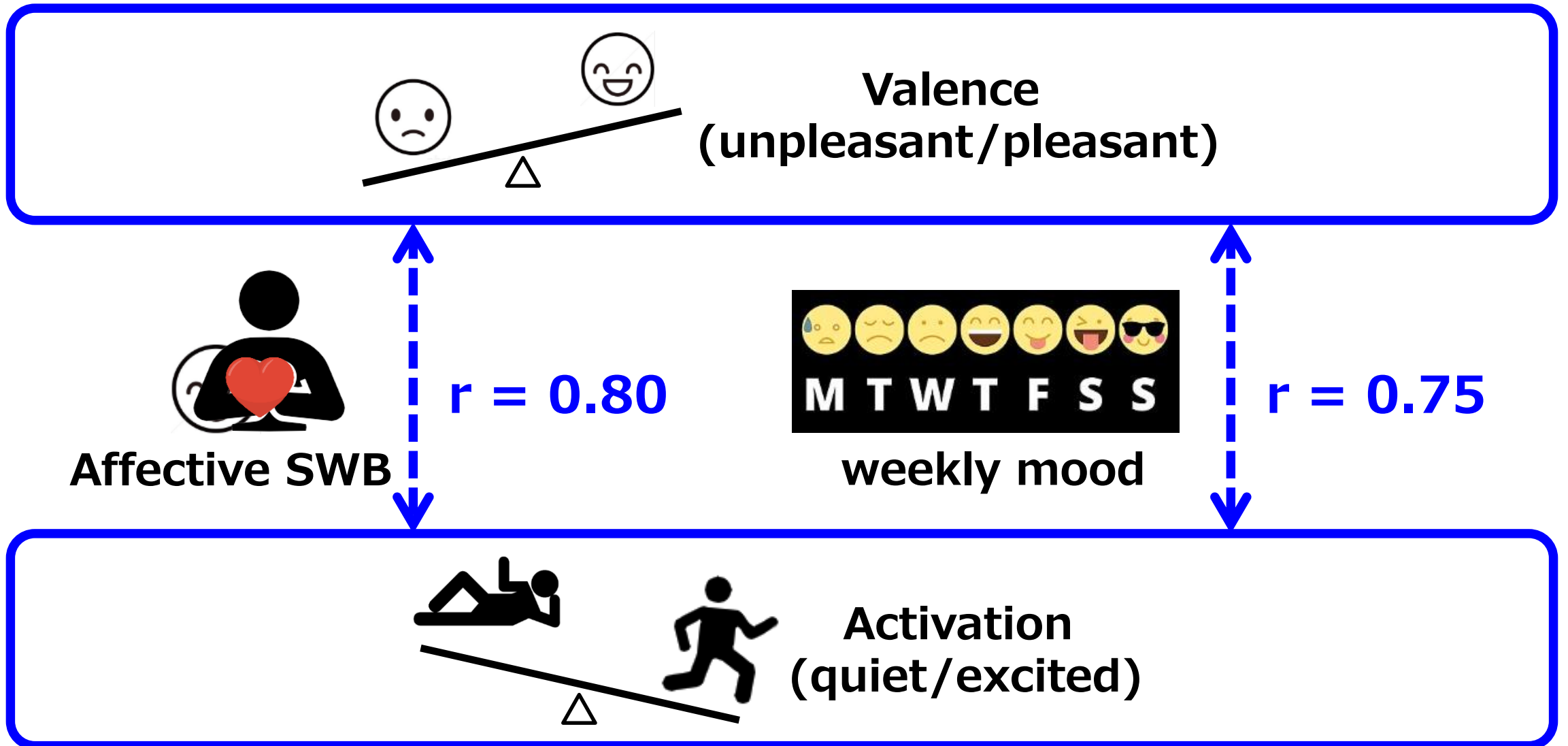| #	Parameter(Axis)
1	"I am completely satisfied with **my daily travel**"
2	"**Travel facilitates my daily life**"
3	"When I think about my daily travel, **the positives outweigh the negatives**"
4	"I would **not change anything** about my daily travel"
5	"Daily travel **makes me feel good**"

Respondents used a 7-point Likert scale ranging from 0 (disagree) to 6 (completely agree).

the STS was created by averaging the ratings for each item

Emotions felt by respondents during each activity were measured.

■ Evaluation

atomic value

Valence
(unpleasant/pleasant)

r = 0.77 for all activities, ranging from 0.69 to 0.91 when each activity was evaluated individually

Activation
(quiet/excited)

	0	1	2	3	4	5	6	7
Sad,								
Dissatisfied								
Depressed								
Happy								
Satisfied								
Joyful								

	0	1	2	3	4	5	6	7
Sleepy								
Reluctant								
Bored								
Awake								
Active								
Alert								

"What they felt last week" and "what they felt overall"

Valence (unpleasant/pleasant)

Affective SWB

r = 0.80

weekly mood

r = 0.75

Activation (quiet/excited)

Cognitive SWB was assessed by the Satisfaction with Life Scale (SWLS)

Extracting five parameters

(*)A measure of internal consistency, that is, how closely related a set of items are as a group.

#	Parameter(SWLS)
1	My life is close to **my ideals**
2	Conditions of my life are **excellent**
3	I am **satisfied with my life**
4	So far I **have achieved** the important things I want in life
5	if I could live my life again I would change **almost nothing**

Inter-item correlations ranged from 0.54 to 0.79

A Cronbach's alpha[(*)] of 0.90

Cognitive SWB

4. Data analyses

Three viewpoints from "regression analysis"
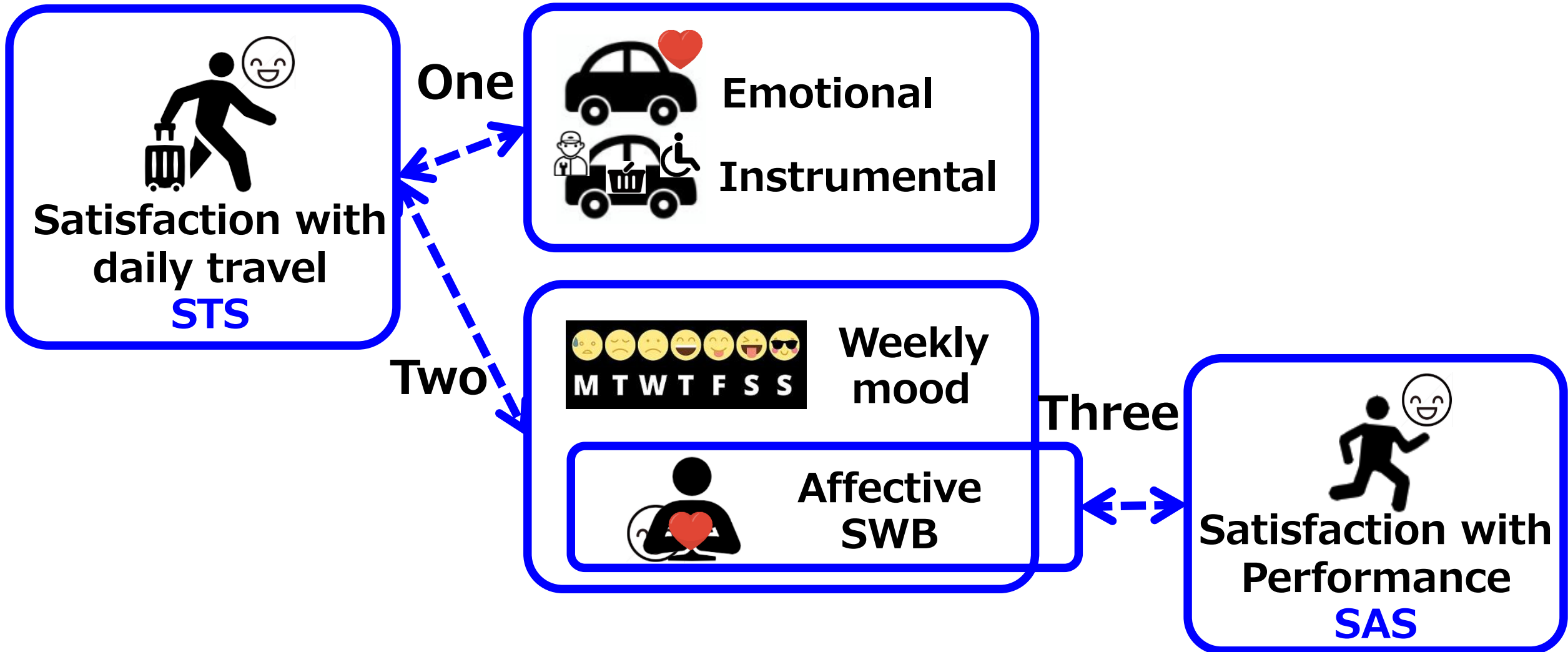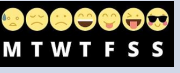
5. Results

5-1. Data trend(1)

#	Item	Size	mean	SD	d^s	1	2	3	4	5	6
1	Cognitive SWB ♥	1320	4.0	1.3	0.09						
2	Affective SWB	1313	1.3	1.2	0.16	0.64					
3	Weekly mood MTWTFSS	1320	1.0	1.3	0.13	0.56	0.68				
4	SAS	1298	1.3	0.9	0.06	0.37	0.48	0.55			
5	STS	1317	3.7	1.3	0.06	0.24	0.20	0.22	0.26		
6	Car in household 🚗	1313	1.5	0.8	0.24	0.15	0.08	0.08	0.02	0.01	
7	Weekly car use (%)	1290	76.8	33.4	0.32	0.06	-0.02	0.03	-0.06	0.08	0.47

■ Trip satisfaction [STS] and cognitive SWB range from 0 to 6, with higher values indicating higher STS and cognitive SWB.

■ Activity Satisfaction [SAS], Cognitive SWB, and Global Affective SWB range from -3 to 3, with higher values indicating higher STS and cognitive SWB.

■ Positive affect ranges from -3 to 3, with negative values indicating negative affect and positive values indicating positive affect.
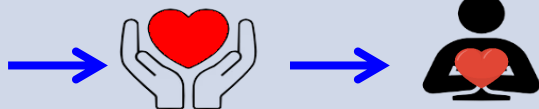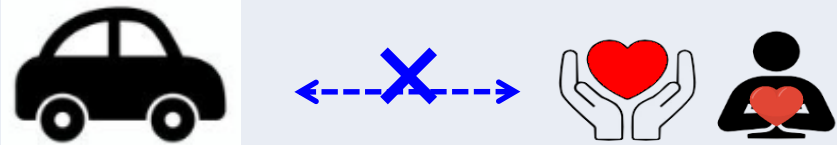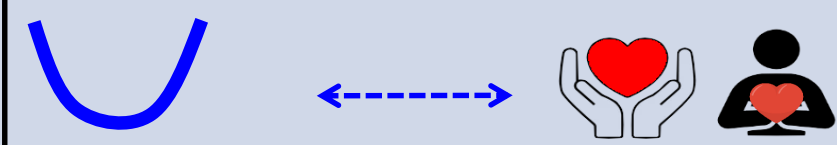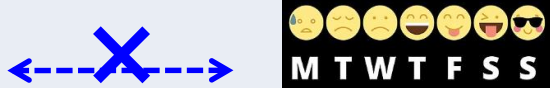
5-2. Data trend(2)

OLS multiple regression analysis with travel satisfaction (STS) as the dependent variable

Table 3 OLS multiple linear regression analysis with satisfaction with travel (STS) as dependent variable, number of cars in household, weekly percent car use and socio-demographic variables as independent

	n	β	t	p
# Cars in household	1,313	−0.02	0.61	0.545
Weekly car use (%)	1,290	0.08	2.49	0.013
Sex (man 1 vs. woman −1)	1,325	0.05	1.62	0.105
Age (36–54 years 1 vs. 18–35 years −1)	1,322	−0.03	−0.88	0.381
Age (55+ years 1 vs. 18–35 years −1)	1,322	0.14	4.13	<0.001
University (1 vs. lower −1) education	1,319	0.01	0.27	0.787
Employment (%)	1,313	0.03	1.15	0.249
Income (1–6)	1,211	0.03	1.02	0.310
Cohabitant (yes 1, no −1)	1,316	−0.03	−0.90	0.368
Children (yes 1, no −1)	1,318	−0.06	−1.89	0.059
Urban (1 vs. rural −1) residential area	1,275	−0.03	−0.65	0.515
Semi-rural (1 vs. rural −1) residential area	1,275	0.02	0.40	0.686

$R^2_{adj} = 0.02$, $F(12,1317) = 3.77$, $p < 0.001$

5-3. Data trend(3)

| #	Summaries	Pictures with Icons
1	Regression coefficients for STS are **slightly different for weekly mood, affective SWB, and cognitive SWB**,	
	However, **all three analyses show significant regression coefficients with positive signs**	
2	Regression coefficients for **sex, cohabitation, education, and employment tend** to increase from **weekly mood through emotional SWB** to **cognitive SWB**	**sex, cohabitation, education, and employment tend**
3	Regression coefficients for **household car ownership** and car **ownership per week** are **not significant.**	
4	Results for the two age variables yielded a **U-shaped** relationship with **both affective and cognitive SWB**	
5	**No age** differences were obtained for **weekly mood**	**Age**

A Figure of Simple relationship
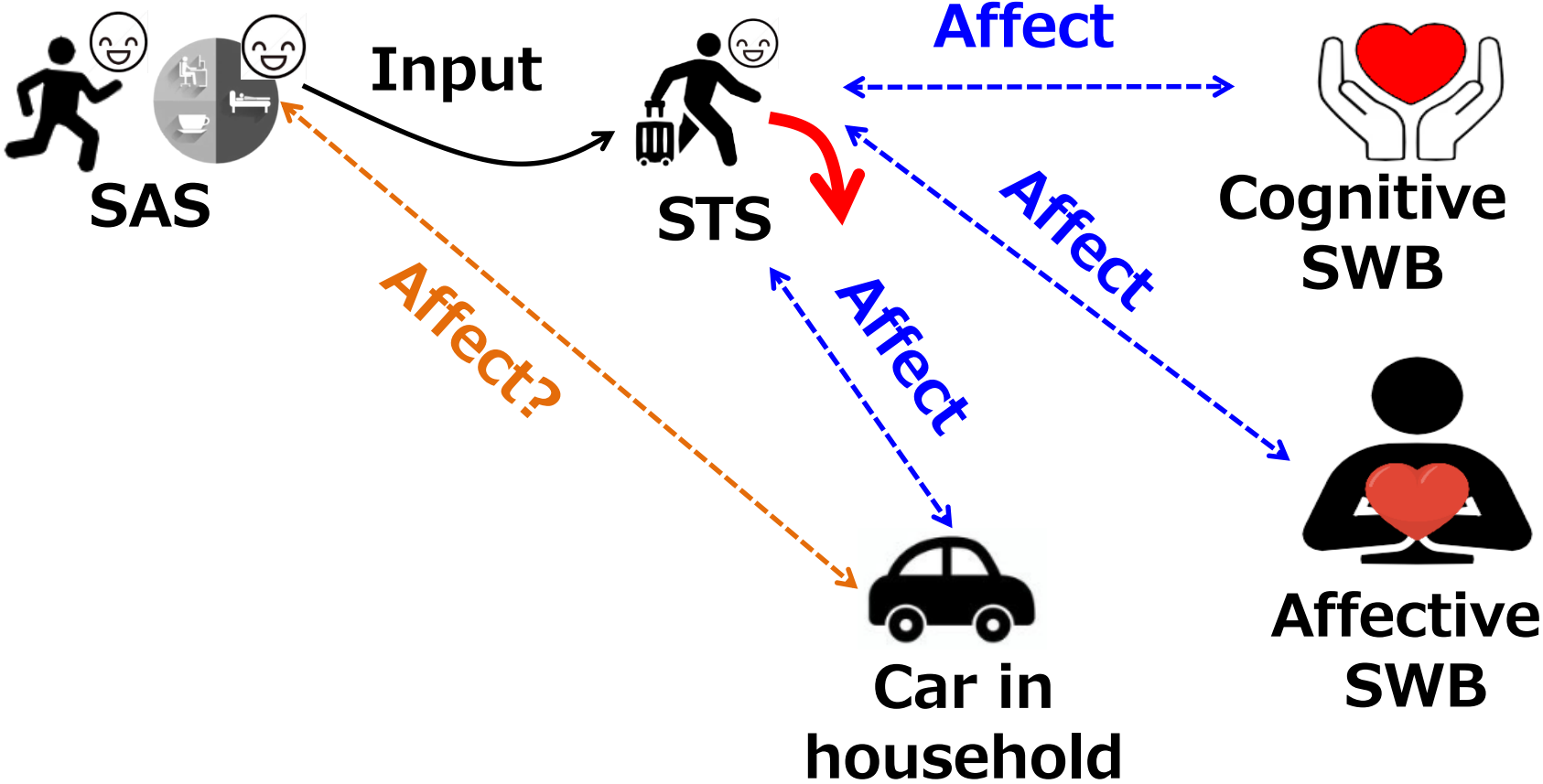
6. Discussion

The impact of satisfaction with **daily mobility (STS)** on emotional and **cognitive SWB** is both direct and mediated by satisfaction with **activity performance (SAS)**
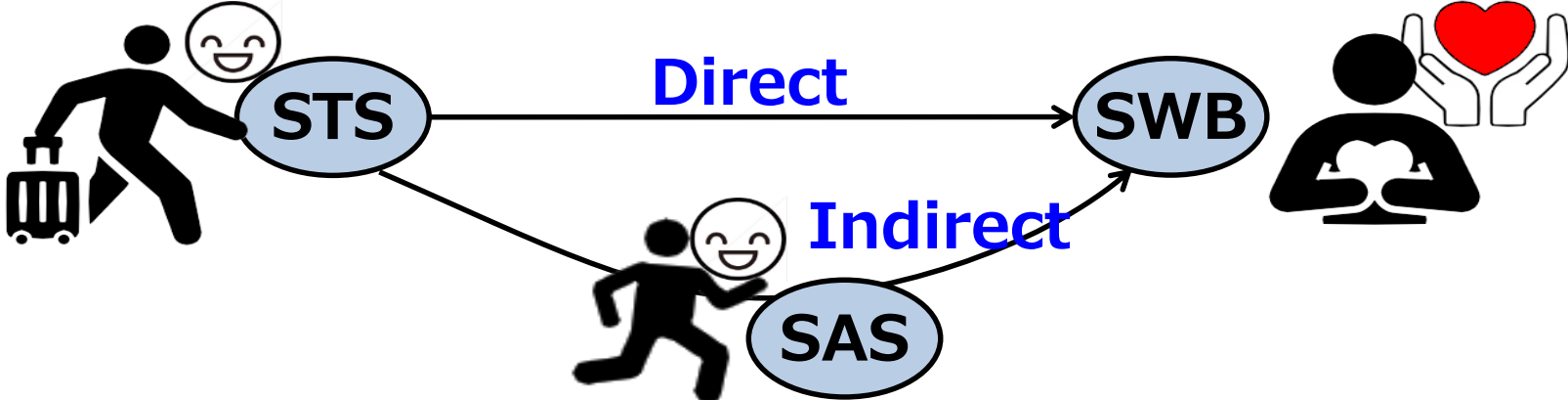
Car use plays only **a minor role** in satisfaction with **daily mobility and its impact on SWB**
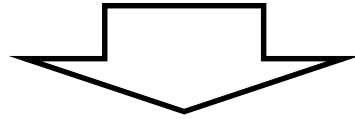

Weekly use   **SWB**   **Daily Satisfaction**
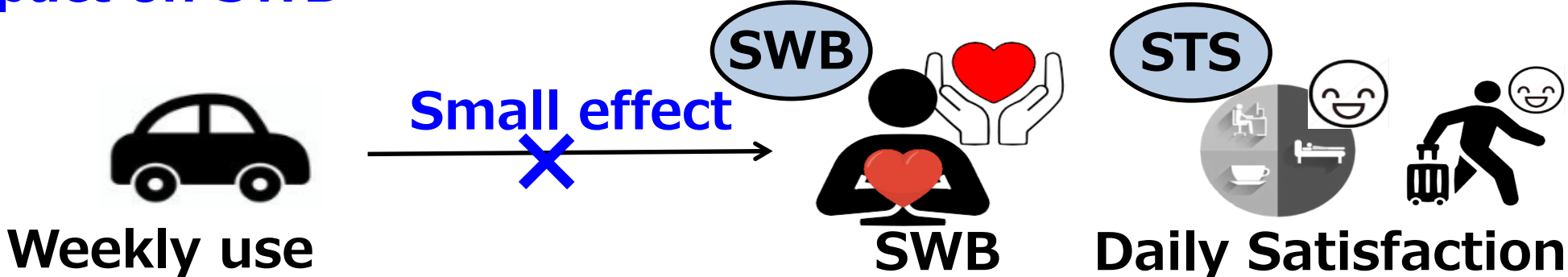
6-2. Reasons of the conclusions

Because the automobile is superior to other modes of transportation, they **adjust their schedule of activities** so that they have **less need for multi-purpose travel**, or they have chosen to **live in a location with** satisfactory **public transportation services**

Older respondents and those **without children** are presumed to have **less complex mobility needs** than younger respondents and those with children,

and therefore are **more satisfied with their daily mobility**

7. Others

7-1. About SWB、STS

Subjective Well-Being(SWB) scale has been used and established **in numerous studies.**

Travel Satisfaction Scale (STS) was designed as a general measure of satisfaction with **daily travel** that can be used for **any travel mode or combination** of travel modes, and was shown to be a **reliable measure**.

An **improved version of the STS** could be a useful tool for comparing different modes of transportation and other aspects of travel services and identifying factors that increase **satisfaction with daily travel and, ultimately, subjective well-being**