The influence of travel satisfaction to university on the life satisfaction of students in Groningen, the Netherlands.

A case study of the University of Groningen

Colophon

Title: The influence of travel satisfaction to university on life satisfaction of students in Groningen.
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Abstract

Traveling plays a significant role in the daily lives of people worldwide. In recent years, there has been a growing interest among spatial planners and policy makers in researching travel satisfaction and its impacts. However, most of the existing research on travel satisfaction has predominantly focused on commuting experiences of working adults. This study aims to fill that gap by examining how satisfaction with travel to university influences the life satisfaction of students enrolled at the University of Groningen, using primary data collected through an online questionnaire. To address this research objective, the following research question was formulated: *"How does satisfaction with travel to university influence the life satisfaction and thus the subjective wellbeing of students at the University of Groningen?".* Correlation tests conducted in SPSS were utilized to explore the presence and strength of any relationship. The results indicate that, in general, there is no clear relationship between satisfaction with travel and life satisfaction among students. However, when considering gender as a factor, the findings become more nuanced, suggesting a relationship between satisfaction with travel and life satisfaction specifically among male students. Further findings explored what spatial interventions can improve travel satisfaction to university. The findings presented in the study are valuable for policy makers and spatial planners in their effort to design user-friendly road networks, particularly tailored to the needs of younger generations. Future research should explore various aspects of the built environment and its influence on travel satisfaction to gain a comprehensive understanding of what students' value most while commuting to university. This will enable a more accurate presentation and aid in shaping future policies and infrastructure development.

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1. Introduction

1.1 Background and relevance

Students at universities are the future of the world. They will be the ones who, in the future, make important decisions, lead communities and organizations, and contribute to new and important research in a wide range of fields. They will bring fresh perspectives, innovative ideas, and a willingness to challenge established norms. Additionally, students represent the future workforce of our society. During their university years, they acquire knowledge and skills that they can apply to their professional careers and personal lives. A well-educated workforce is essential for economic growth, as it brings in new insights and knowledge. Moreover, students have the potential to have positive impacts on their surroundings, shape the future, understand others' intentions, actions, and feelings, and anticipate the short and long term consequences of their actions (Andreas Schleicher, 2018). To achieve good academic performance, students need to have their mindset in the right place.

Quality of Life (QOL) is a concept that is widely understood by people as "goodness of life," encompassing the ability to live successfully and happily within one's environment (Brown and Brown, 2005). It is a multifaceted concept utilized by various disciplines and examined at different spatial scales. Indicators of QOL include wealth, employment, natural and physical environment, education, and social belonging (Mohit, 2013). The World Health Organization (WHO, 2012) defines QOL as follows: "an individual's perception of their position in life, in the context of the culture and value systems in which they live, and in relation to their goals, expectations, standards, and concerns." QOL is highly subjective as it varies based on individuals' views and norms. Consequently, the study of QOL has attracted researchers from diverse academic disciplines, as well as piqued the interest of spatial planners, policy makers, and other environmental design fields, making it an inherently interdisciplinary concept (Mohit, 2013). Several scholars argue that the ultimate goal of urban planning is to enhance QOL (Yin, Zhang and Shao, 2020). One major factor influencing QOL is Subjective Wellbeing (SWB), with a positive SWB associated with a higher QOL (Mohit, 2013). Life satisfaction in turn is an important factor of SWB, and involves a cognitive judgmental process (Diener *et al.*, 1985). Life satisfaction, as well as SWB, are related to domain-specific satisfaction, including health satisfaction, job satisfaction, family life satisfaction, and leisure satisfaction (Pinquart and Silbereisen, 2010; Malvaso and Kang, 2022). Travel satisfaction has been identified as another domain-specific satisfaction which influences life satisfaction (Ettema *et al.*, 2010; Friman *et al.*, 2017).

Students studying at universities are required to travel to university buildings on a daily basis in order to attend classes and participate in campus activities, making traveling a significant aspect of their lives. Several studies have demonstrated that travel satisfaction can have a significant impact on an individual's SWB and life satisfaction. For instance, long commutes, traffic congestion, and unreliable public transport can lead to stress, fatigue, and frustration, thereby negatively affecting mental health and overall life satisfaction (Gatersleben and Uzzell, 2007; Choi, Coughlin and D'Ambrosio, 2013). Conversely, convenient and dependable transportation options can uplift one's mood, reduce stress, and enhance overall life satisfaction. Given the importance of travel to university for students in Groningen, it is crucial to comprehend the level of satisfaction students experience with their travel to university buildings. Several factors can contribute to travel satisfaction or dissatisfaction. Therefore, it is important to understand these factors and their potential impact on students' life satisfaction and SWB. Extensive research has been conducted on travel satisfaction and its influence on life satisfaction and SWB (Gatersleben and Uzzell, 2007; Novaco and Gonzalez, 2009; Choi, Coughlin and D'Ambrosio, 2013; Kroesen, 2014; Mokhtarian, 2019; Yin, Zhang and Shao, 2020). However, most of the existing literature primarily focuses on the commute of working adults rather than young adults traveling to their university. Hence, this research aims to shed light on the influence of satisfaction with travel to university on students' life satisfaction and SWB.

1.2 Research aim and research question

This research aims to investigate the level of satisfaction among students at the University of Groningen with their travels to university and the potential influence of this travel satisfaction on their overall life satisfaction. In addition, it aims to explore how this level of satisfaction with travel to university can be enhanced. To do so, an online questionnaire was sent to students at the University of Groningen. In order to investigate these aims, the following research question was formulated:

"How does satisfaction with travel to university influence the life satisfaction and subjective wellbeing of students at the University of Groningen?"

To help answer this research question, four sub-questions were developed:

SQ1: *"How does satisfaction with travel and life satisfaction vary among students in different gender groups, age groups, modes of transport, and commute times?"*

SQ2: *"How satisfied are students with their travels to university, as assessed by the STS, and how does this differ from their self-reported travel satisfaction?"*

SQ3: *"What is the correlation between the satisfaction with travel and life satisfaction across different gender and modes of transport categories?"*

SQ4: *"What are potential spatial interventions that could improve students' satisfaction with travel to university?"*

By addressing these sub-questions, this research aims to gain insights into the relationship between travel satisfaction and life satisfaction among students at the University of Groningen and identify potential interventions to enhance their satisfaction with travel to the university.

1.3 Structure of the thesis

The first chapter of this thesis introduced the topic, its relevance, and the research aim. The second chapter will discuss relevant concepts and theories that will enhance the understanding of the topic and concepts. In chapter three, the research methodology is introduced and explained. Chapter four presents the research results and data. This is followed by chapter five, which conducts a discussion on the results and establishes connections to the existing literature. Then, the conclusion of the study is presented in the conclusion, which also discusses the research limitations as well as providing recommendations for future research. Finally, the bibliography and appendices are presented.

2. Theoretical framework

2.1. Subjective Wellbeing

Subjective Wellbeing (SWB) can be described as the degree to which a person positively evaluates their overall quality of life (Diener *et al.*, 1985; National Research Council *et al.*, 2014; Steptoe, Deaton and Stone, 2014; Chatterjee *et al.*, 2020). SWB consists of three separate components: evaluative wellbeing (or life satisfaction), hedonic wellbeing, and eudemonic wellbeing (Steptoe, Deaton and Stone, 2014). Evaluative wellbeing refers to individuals' thoughts about the goodness or quality of their lives, often referred to as overall life satisfaction. Hedonic wellbeing relates to the feelings or moods experienced on a daily basis, such as happiness, sadness, and anger. Lastly, eudemonic wellbeing focuses on judgements about the meaning and purpose of life (Steptoe, Deaton and Stone, 2014). SWB has significant consequences for health, longevity, and success in life (Friman *et al.*, 2017). Some scholars argue that life evaluation questions captures everything that matters (Layard, 2011; Steptoe, Deaton and Stone, 2014). Therefore, study will focus on the life satisfaction component of SWB of students, which in turn relates to the subjective wellbeing.

2.2 Life satisfaction

Life satisfaction, also known as evaluative wellbeing, involves a cognitive judgemental process (Diener *et al.*, 1985). It refers to individuals' thoughts about the quality or goodness of their lives (Steptoe, Deaton and Stone, 2014). The judgment of satisfaction is influenced by an individual's comparison of their circumstances to their self-established standards, rather than externally imposed standards (Diener *et al.*, 1985). Life satisfaction encompasses a global evaluation of various domain-specific satisfaction aspects, including health satisfaction, travel satisfaction, and satisfaction with other aspects such as housing, residential environment, and family (Pinquart and Silbereisen, 2010; Yin, Zhang and Shao, 2020; Malvaso and Kang, 2022).

2.3. Satisfaction with travel

Travel plays a significant role in many people's lives as a regular and unavoidable daily activity that consumes substantial time and will continue to be a dominant feature of everyday life in the future. This is also the case for university students who have to travel to university buildings on a daily basis to participate in classes. As mentioned earlier, travel satisfaction is an important indicator of an individual's life satisfaction (Friman *et al.*, 2017; Yin, Zhang and Shao, 2020). This suggests that satisfaction with travel has an influence on an individual's SWB. Determinants of travel satisfaction can be categorized in six categories: socio-demographics, general travel attributes, built environment and spatial attributes, trip-specific characteristics, travel-based activities and travel time perception, and attitudinal characteristic (Acharya, Mekker and Singleton, 2023). Furthermore, Satisfaction with travel includes both cognitive evaluations and affective evaluations (Friman *et al.*, 2017). Cognitive evaluation involves a comprehensive assessment of daily travel, focussing on the quality of travel and whether it meets high or low standards (Friman *et al.*, 2017). Factors influencing cognitive evaluation can vary depending on the mode of transportation, for example, factors influencing cognitive evaluation for bike travel include road infrastructure, travel time, safety aspects, and urban form. Affective evaluations relate to context-specific factors, such as various episodes or events during travel that generate momentary effects (Friman *et al.*, 2017). For example, during cycling feelings of relaxation and a sense of freedom can be reported or during a car ride, feelings of stress and aggressiveness can be observed. Satisfaction with travel has two affective components, ranging from positive activation to negative deactivation and from positive deactivation to negative activation (Bergstad *et al.*, 2011; Ettema *et al.*, 2011; Friman *et al.*, 2017; Singleton, 2019). Previous theoretical research has found that travel enables activity participation, which is instrumental for people to achieve important goals in their lives and increase life satisfaction (Ettema *et al.*, 2010; Friman *et al.*, 2017). Travelling for work, school, and leisure encompasses journeys that exhibit distinct characteristics such as travel mode, duration, and cost, which facilitate in varying degrees activity participation. Previous empirical research has investigated and verified the relationship between satisfaction with travel and life satisfaction (Friman *et al.*, 2017). One of the factors of

satisfaction with travel is commute time, which has a strong negative impact on SWB. Subsequently, this means that longer commute times are associated with a lower SWB (Choi, Coughlin and D'Ambrosio, 2013). Longer commute distances are also negatively associated with SWB, with longer commuting distance being associated with lower SWB (Nie and Sousa-Poza, 2018). Different travel modes also influence satisfaction with travel, with several studies showing that individuals who use active transportation modes (walking and cycling) generally have higher life satisfaction compared to those who commute by car on a daily basis and with public transport having the lowest life satisfaction (Gatersleben and Uzzell, 2007; Novaco and Gonzalez, 2009; Friman *et al.*, 2017; Nie and Sousa-Poza, 2018; Nieuwenhuijsen, 2018; Mokhtarian, 2019). However, another study found that public transport users report a higher life satisfaction over time compared to car users (Martin, Goryakin and Suhrcke, 2014).

2.3.1. Satisfaction with travel scale

To measure a person's satisfaction with travel, a scale was developed by Bergstad *et al.* (2011). This five-item satisfaction with travel scale (STS) was developed to assess satisfaction with daily travel without focusing on any particular travel mode (Bergstad *et al.*, 2011). The items include four cognitive evaluations and a general affective item to measure how good travel made the respondents feel. Ettema *et al.* (2011) improved the STS by Bergstad *et al.* (2011) by including more items and therefore creating a more accurate scale. The improved STS consists of a nine item self-report scale that include both several cognitive and affective components related to daily travel (Ettema *et al.*, 2011). The affective components comprise of six items selected based on two dimensions: valence and activation. Valence corresponds to the positive or negative aspects of the emotion, while activation relates to the "the strength of the person's disposition to take some action rather than none." (Cowie and Cornelius, 2003). The six items are divided into two groups, with each group consisting of 3 items. The first group is distinguished by positive deactivation and negative activation (PDNA), while the second group is distinguished by positive activation and negative deactivation (PAND). Cognitive evaluation (CE) items are measured by three items referring to general quality and efficiency of the transport services used (table 1) (Ettema *et al.*, 2011). In this study, the STS with further improvements from Singleton (2019) is used. This STS still consists of a nine-item self-report scale, but the wording of the items mentioned in table 1 was adjusted to fit an American and English language context and better match the opposite edges of the two-dimensional core affect concept (Singleton, 2019) (See table 2). This revised version of the nine-items was created using the original STS by Ettema *et al.* (2011) and other versions of the STS (Singleton, 2019). The items from Singleton (2019) were chosen for the STS in this study as they are more appealing and understandable for students.

Table 1: The nine STS items as designed by Ettema et al. (2011).

The Satisfaction with Travel Scale items by Ettema *et al.* (2011)
Positive deactivation – Negative activation
Time pressed – Relaxed
worried I would not be in time – Confident I would be in time
Stressed – Calm
Positive activation – Negative deactivation
Tired – Alert
Bored – Enthusiastic
Fed up –Engaged
cognitive evaluation
Travel was worst – best I can think of
Travel was low – high standard
Travel worked well – worked poorly

Table 2: The nine STS items as modified and designed by Singleton (2019).

The Satisfaction with Travel Scale items by Singleton (2019)
Positive deactivation – Negative activation
I was very distressed – content
I was very tense – relaxed
Positive activation – Negative deactivation
I was very sad – happy
I was very tired – energized
I was very bored – enthusiastic
cognitive evaluation
My trip was displeasing – enjoyable
My trip went poorly – smoothly
My trip was the worst – best I can imagine
I was worried I wouldn't – confident I would arrive on time

2.5. Conceptual model

The proposed conceptual model for this study is depicted in figure 1. The model emphasizes the relationship between travel satisfaction and life satisfaction. At the top of the model, life satisfaction is positioned as the overarching construct, as this study aims to investigate the impact of travel satisfaction on life satisfaction. It is important to note that travel satisfaction is considered a component of life satisfaction, which is reflected in the model. Furthermore, the model acknowledges that various factors can influence travel satisfaction. While the literature mentions several other factors, for the sake of simplicity and relevance to this study, not all factors influencing travel satisfaction are explicitly mentioned in the model. Sociodemographic factors influence both travel satisfaction and life satisfaction The focus remains on understanding the relationship between travel satisfaction and life satisfaction.

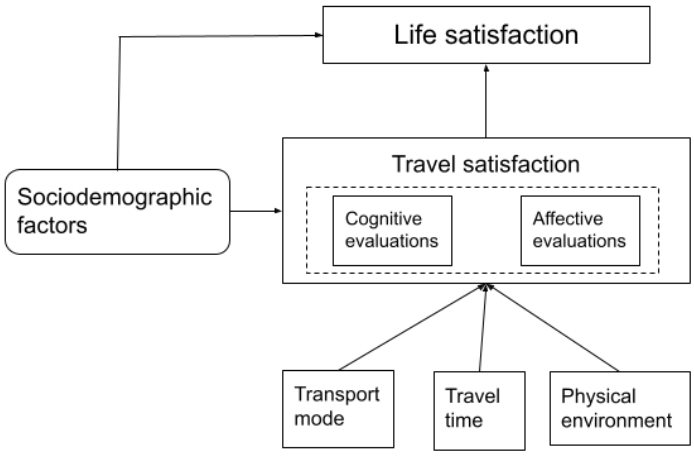

Figure 1: Conceptual model.

3. Methodology

This study used a mixed-methods approach for collection of data and information. A literature review was conducted to explain concepts that are relevant for this study. Furthermore, primary data was collected using an online questionnaire to answer the research question which is specific to an area. This approach classifies the study as quantitative research. Quantitative research is chosen as it focuses on collecting and analysing numerical data to understand and explain phenomena, in the case of this study the relationship between travel satisfaction and life satisfaction. The numerical nature of the data allows for the application of statistical tests, such as correlation tests. Furthermore, it allows researchers to make general conclusions and make predications about a larger population (Burt, Barber and Rigby, 2009).

3.1. Literature review

During this research, a literature review was conducted to identify and explain the relevant concept that are utilized throughout the research. This review provides insights into these concepts, which in turn aids in answering the various sub-questions and the main research question. Search engines such as "SmartCat" and "Google Scholar" were employed to locate relevant articles and books. Keywords such as "subjective wellbeing," "life satisfaction," "travel satisfaction," and "Satisfaction with travel scale" were utilized to conduct the search for pertinent literature.

3.2. Online questionnaire

During this research an online questionnaire was utilized to collect primary data for the study. The questionnaire covered the aspects: sociodemographic characteristics, travel satisfaction, and life satisfaction and subjective wellbeing of the participants. To construct the online questionnaire, the research suite "Qualtrics" was used, which is a web-based survey tool known for its user-friendly interface and comprehensive features for questionnaire construction, dissemination, and data analysis. Qualtrics allows exporting in multiple formats, making it an ideal choice for this study. Additionally, the University of Groningen provides free access to Qualtrics for its employees and students, further supporting the decision to use this tool. The web-based nature of the questionnaire facilitated data collection from a large sample of students, since the questionnaire is accessible by any electronic device (laptop, computer, phone, tablet). The questionnaire comprised multiple-choice, matrix, and open questions. As mentioned earlier, several characteristics of the participants were collected. These characteristics were divided into three underlying themes. Firstly, sociodemographic questions were asked, which included inquiries about gender and age. Secondly questions were posed regarding students travel to university, asking questions about travel mode, travel time, and travel satisfaction to the university, utilizing the Satisfaction with Travel Scale (STS) mentioned earlier in this thesis. The STS questions were designed to have a scale ranging from -3 to 3. The nine items of the scale were summed up in the analysis per participant, this gave a score which indicates how satisfied the participants are with their travel to university, with a score of -27 being extremely dissatisfied and a score of 27 being extremely satisfied. Next to that, the survey included a question asking the respondents how satisfied they are with their travel to university, using the statement "overall, I am satisfied with my commute to university." The statement used a 7-point Likert scale ranging 1 to 7 which represented strongly disagree to strongly agree respectively. This single question captured the respondents self-reported travel satisfaction to university. Furthermore, the survey included questions about potential spatial interventions that could improve satisfaction with travel. This was achieved with a multiple-choice question that provided predefined spatial interventions by the researcher, along with an open question where respondents could express their own thoughts or suggest additional interventions. Finally, a question regarding satisfaction with life was included, consisting of one question. The question assessed the level of satisfaction students have with their lives on a 7-point Likert scale ranging from 1 to 7 which represented extremely dissatisfied and extremely satisfied respectively. A comprehensive overview of the questions included in the online questionnaire can be found in Appendix 1.

The target group of this research is students studying at the University of Groningen, focussing on their travel satisfaction to university. To reach the target group, the questionnaire was distributed through various social media channels such as WhatsApp and Instagram. In addition, flyers were made, see appendix 2, and displayed in various university buildings and supermarkets to reach more students. This sampling method utilized simple random sampling technique. The collected data was formatted and exported into SPSS for analysis. The analysis involved a combination of descriptive statistics, reliability tests and correlation analysis.

3.3. Ethical considerations

To ensure ethical conduct, it is of utmost importance to uphold transparency and honesty with regards to the research objectives, intentions, and the methodologies employed for data collection and analysis (Hay, 2016). In this study, respondents were granted freedom to participate in the online questionnaire, ensuring voluntary participation. Additionally, it is important to note that the researcher was absent during the respondents' completion of the survey, effectively eliminating any power asymmetry between the research and the participants. This approach fosters a more unbiased and autonomous environment for the participants. To further uphold ethical principles, the collected data was anonymized, ensuring the confidentiality and privacy of the participants. Furthermore, the research finding will be shared exclusively withing the researcher's organization, the University of Groningen, maintaining confidentiality and integrity of the research outcomes. By adhering to these ethical considerations, the study strives to promote the wellbeing and rights of the participants while maintaining the highest standards of integrity.

4. Results

In total 69 student's respondent to the online questionnaire. However, six students did not complete the survey and have therefore been excluded from the analysis, leaving 63 valid cases for inclusion in the analysis. According to the Central Limit Theorem, as the sample size increases, the sample distribution becomes more normal (Burt, Barber and Rigby, 2009). All SPSS output tables can be found in appendix 3.

4.1. Descriptive statistics

The sample characteristics are presented in table 3, which includes the 63 valid cases for analysis. It is observed that the sample has a slightly higher proportion of female cases than male, which somewhat corresponds with the percentage of female students (53,4%) studying at the RUG (Siebelink, 2020). The distribution of age, mode of transport, and commute time can also be found in table 3. The majority of the cases (76,2%) in the sample reported cycling as their primary mode of transportation to the university. This preference for cycling aligns with its practicality, speed, and affordability, particularly in urban areas where many students reside. Public transportation is utilized by 14.3% of the respondents, making it the second most popular choice, although this percentage is significantly lower compared to cycling. Walking and car usage each represent 4.8% of the sample, indicating that a relatively small proportion of students use these modes of transportation.

Table 3: Sample characteristics

	Frequency	Percentage (%)
Total N	63	100
Gender		
Female	34	54.0
Male	29	46.0
Age		
16 – 18	0	0
19 – 21	20	31.7
22 – 24	35	55.6
25+	8	12.7
Mode of transport		
Walking	3	4.8
Cycling	48	76.2
Car	3	4.8
Public transport	9	14.3
Commute time		
0 – 10 min	24	38.1
10 – 20 min	24	38.1
20 – 30 min	7	11.1
30 – 60 min	2	3.2
60+ min	6	9.5

Table 4 illustrates the satisfaction levels categorized by gender, age group, mode of transport, and commute time. For simplicity, the researcher categorized all positive STS scores as satisfied and all negative STS scores as dissatisfied, and the same approach was applied for life satisfaction. Overall, it is evident that all groups express satisfaction with their travel experiences. Specially, female students exhibit a higher level of satisfaction with their travel to university compared to their male counterparts. However, when testing the difference using the Mann Whitney U test, the results show that the difference is not statistically significant at $\alpha = 0.05$. Furthermore, there is no substantial disparity in travel satisfaction across different age groups, with satisfaction rates of 70.0%, 68.6%, and 75.0% for the age groups 19 – 21, 22 – 24, and 25+ respectively. Kruskal-Wallis test show that difference in travel satisfaction under the age groups are not statistically significant. Moreover, when looking at the

Table 4: Satisfied – dissatisfied distribution of travel satisfaction and life satisfaction, given in percentage (%)

	Satisfaction with Travel		**Life satisfaction**	
	Satisfied	Dissatisfied	Satisfied	Dissatisfied
General	69.8 %	30.2 %	92.1 %	7.9 %
Gender				
Female	73.5	26.5	94.1	5.9
Male	65.5	34.5	89.7	10.3
Age group				
19 – 21	70.0	30.0	100.0	0.0
22 – 24	68.6	31.4	88.6	11.4
25 +	75.0	25.0	87.5	12.5
Mode of transport				
Walking	100.0	0.0	100.0	0.0
Cycling	72.9	27.1	91.7	8.3
Car	66.7	33.3	66.7	33.3
Public transport	69.8	30.2	100.0	0.0
Commute time				
0 – 10 min	79.2	20.8	95.8	4.2
10 – 20 min	70.8	29.2	95.8	4.2
20 – 30 min	42.9	57.1	71.4	28.6
30 – 60 min	50.0	50.0	100.0	0.0
60 + min	66.7	33.3	83.3	16.7

satisfaction with mode of transportation, the results shows that the active transportation modes (walking, cycling) score a higher STS score than that of the car and public transport, although this difference is minimal. However, again here a Kruskal-Wallis test show that the difference is not statistically significant. Analysing the STS scores in relation to commute time, we observe a decrease in STS from the 0 – 10 min commute to the 20 – 30 min commute. Surprisingly, the STS scores increases again from the 30 – 60 min commute time range onwards. The table also provides insight into the respondents' satisfaction with life, categorized by gender, age group, mode of transport, and commute time. Once again, the data shows that overall, every group tends to be more satisfied than dissatisfied with their lives. Interestingly, however, students generally express higher satisfaction with their overall life compared to their satisfaction with travel. This distinction is particularly noticeable among those who use public transportation, where 69.8% of the respondents are satisfied with their travel experiences, while 100% express to be satisfied with their lives. Although these percentage are not the result of a formal statistical test, they still offer some insight into the potential relationship between satisfaction. The test results and a more in-depth analysis of satisfaction scales can be found in appendix 3.2.

It is interesting to observe the students' self-reported satisfaction with travel to university and how it contrasts with their measured travel satisfaction, as assessed with the STS. These disparities can be observed in table 5. A significant number of respondents perceive their satisfaction with travel to university higher than what is reflected in the measured travel satisfaction. More than half of the respondents (52.4%) perceive their travel to university as satisfied, with this percentage dropping drastically as the satisfaction levels decreases. On the other hand, the measured travel satisfaction indicates that only 12.7% of the respondents are satisfied with their travels, and this percentage increases as the satisfaction

Table 5: Self-reported travel satisfaction and Assessed travel satisfaction.

	Frequency (percentage)	
	Self-reported satisfaction with travel	Assessed satisfaction with travel (STS)
Extremely satisfied	9 (14.3)	5 (7.9)
Satisfied	33 (52.4)	8 (12.7)
Somewhat satisfied	14 (22.2)	23 (36.5)
Neither satisfied nor dissatisfied	5 (7.9)	16 (25.4)
Somewhat dissatisfied	0 (0.0)	5 (7.9)
Dissatisfied	1 (1.6)	3 (4.8)
Extremely dissatisfied	1 (1.6)	3 (4.8)

levels decrease. The measured satisfaction with travel reveals that the majority of respondents are somewhat satisfied (36.5%) or neither satisfied nor dissatisfied (25.4%). These results help answer SQ2 as they indicate that students report their travel to university as more satisfied than it actually is, as assessed by the STS.

4.2. Reliability test

Table 6: Internal consistency of the STS items

	Cronbach's Alpha
PDNA	0.786
PAND	0.753
CE	0.754
All items	0.919

Cronbach's Alpha is a widely used measure of internal consistency, particularly for surveys that employ Likert scale questions to form a scale. It assesses the reliability of the scale used in the survey. In this study, it was used to examine the internal consistency of the nine items comprising the Satisfaction with Travel Scale. The analysis evaluated the internal consistency within the different groups, Positive Deactivation and Negative activation (PDNA), Positive Activation and Negative Deactivation (PAND), and Cognitive Evaluation (CE), as well as among the nine items collectively. The results of this analysis is represented in table 6, indicating that all items within each group demonstrates an acceptable consistency (0.70 – 0.80) and the nine items together having a high degree of internal consistency (>0.90).

4.3. Correlation tests

Table 7: Results Pearson correlation test

	p-*value*	*Corelation coefficient*
General	0.216	0.158
Gender		
Female	0.650	-0.081
Male	0.020	0.428
Mode of transport		
Walking	0.084	0.991
Cycling	0.473	0.106
Car	0.701	0.453
Public transport	0.286	0.400

Pearson correlation tests were used to examine the potential relationship between satisfaction with travel and life satisfaction in the sample. The correlation coefficient measures the direction and the strength of a linear relationship between two variables (Burt, Barber and Rigby, 2009). The results of the tests are presented in table 7. The findings indicate that the correlation is not statistically significant at the $\alpha = 0.05$ level, suggesting that, in general, there is no linear relationship between satisfaction with travel and life satisfaction. Further correlation tests were performed splitting the data based on gender and mode of transport. These additional analyses also showed not significant results at the $\alpha = 0.05$ level, indicating no significant relationship within specific modes of transport. However, when splitting the data in gender, it was discovered that there is a significant relationship among the male population of the sample, while the females still are non-significant. This indicates that there is a significant relationship between satisfaction with travel and life satisfaction under the male population of students. The correlation coefficient for the males indicated a moderate correlation (0.3 – 0.5) between satisfaction with travel and life satisfaction. The relationship between satisfaction with travel and life satisfaction under the walking population is significant at the $\alpha = 0.10$ level with a correlation coefficient of 0.991, which is a very strong correlation. However, the change of finding this in the population is small since the confidence level is set at 0.1.

4.4. Spatial interventions that can improve satisfaction with travel.

Table 8: Frequency and percentage of spatial interventions

	Frequency	*Percentage (%)*
Better sidewalks	4	6.3
Better bike lanes	17	27.0
More parking spots for cars	5	7.9
More parking spots for bikes	26	41.3
Better flow of traffic	26	41.3
More nature to travel through	21	33.3
Quicker public transport	10	15.9
More convenient public transportation options	12	19.0
Transit hub nearby university buildings	3	4.8
Shuttle services from nearby neighbourhoods or transit hubs	2	3.2

The survey involved asking students about potential spatial interventions that could improve their satisfaction with travel. This was achieved with a multiple-choice question that provided predefined spatial interventions by the researcher, along with an open question where students could express their own thoughts or suggest additional interventions. The results are presented in table 8. The findings reveal that "more parking for bikes"

and “better flow of traffic” is the most popular spatial intervention in the sample, with each 41.3%. Improving travel flow would mean a decrease in travel time as traffic moves more smoothly. More parking spots for bikes would alleviate the stress and difficulties experienced with finding parking, providing a more convenient and less stressful experience for cyclists. Furthermore, 27% of the respondents emphasized the importance of better bike lanes, which aligns with improving flow of traffic as improved bike lanes can contribute to a smoother flow of bicycle traffic. Another noteworthy observation is that 33.3% of the respondents believe that incorporating more natural elements throughout their travel route to university can improve their satisfaction with travel.

The open question provided Interesting Insights as well. Six respondents expressed the frustration with excessively long wait times at traffic lights for cyclists, with some responding waits exceeding five minutes. Moreover, six respondents mentions that construction works around the city posted difficulties with their travels to university. Requiring them to take several detours. Furthermore, one respondent suggested the introduction of shared campus bikes, while another suggested reducing the number of shared bikes and scooters to make room for additional bike parking spaces. This shows the diverse perspectives of the respondents regarding spatial interventions.

5. Discussion

The aim of this study was to examine the influence of travel satisfaction on the life satisfaction and subjective wellbeing of students. The findings indicate that respondents who use active transportation modes, such as walking and cycling, generally report higher levels of satisfaction with their travel and overall life, which align with existing literature (Gatersleben and Uzzell, 2007; Novaco and Gonzalez, 2009; Friman *et al.*, 2017; Nie and Sousa-Poza, 2018; Nieuwenhuijsen, 2018; Mokhtarian, 2019). Scholars have argued that active transportation modes offers various health benefits, leading to higher levels of satisfaction with travel and life satisfaction compared to other modes of transportation (Nieuwenhuijsen, 2018). Additionally, the results indicate that travel satisfaction is lower for car users as compared to those using public transport, consistent with the findings of Martin, Gorvaking, and Suhrcke (2014). Moreover, the relationship between commute time and travel satisfaction aligns with prior research, showing a tendency for travel satisfaction to decrease as commuting time increases (Gatersleben and Uzzell, 2007; Choi, Coughlin and D’Ambrosio, 2013). However, the results of this research demonstrate a notable increase in travel satisfaction for commute times of 30 – 60 minutes and 60+ minutes. This observation can be attributed to the limited number of cases that fell within these time ranges, making them highly sensitive to any change. Unfortunately, the findings of travel satisfaction not having an influence on life satisfaction does not correspond with the literature. Numerous studies have shown that travel satisfaction does have a significant effect on the life satisfaction of individuals (Friman *et al.*, 2017; Yin, Zhang and Shao, 2020) Which would mean that travel is an important attribute of life satisfaction. In this study, however, this was not found, which could mean that travel for students, is not an important attribute of life satisfaction as it is for adults. Furthermore, the spatial interventions that could improve students’ travel satisfaction to university also align with literature. Several scholars argue that traveling through nature improve an individual’s satisfaction with travel and life (Berman, Jonides and Kaplan, 2008; Capaldi, Dopko and Zelenski, 2014; Chatterjee *et al.*, 2020). The results of this study show that in order to improve their travel satisfaction, students need to travel more through nature or green areas. Next to that the students indicate that a better flow of traffic would also improve their travel satisfaction. This aligns with the literature, in which, the relationship between travel time and travel satisfaction is discussed (Choi, Coughlin and D’Ambrosio, 2013). Longer commute times lead to lower travel satisfaction and life satisfaction.

6. Conclusions

In conclusion, in this research the relation between satisfaction with travel to university and life satisfaction of students at the University of Groningen was examined. While previous literature suggests a connection between satisfaction with travel and life satisfaction, it primarily focuses on adults

commuting from home to work, leaving room for potential difference among students. Therefore, the following research question was proposed: *"How does satisfaction with travel to university influence the life satisfaction and subjective wellbeing of students at the University of Groningen?"* The results indicate that students generally report satisfaction with their travels to university and their overall life as satisfied. However, no significant relationship was found between satisfaction with travel and life satisfaction in the sample, suggesting that satisfaction with travel to university does not impact students' overall life satisfaction. Furthermore, when examining the relationship between satisfaction with travel and life satisfaction within different categories, such as gender, age, mode of transport, and travel time, the only significant result was observed among the male population. This implies that there is a relationship between satisfaction with travel and life satisfaction among male students. Interestingly, the results also revealed that students tend to perceive their satisfaction with travel as higher than what was measured using the STS (Satisfaction with Travel Scale). This suggest that students may have a more positive perception of their travel experiences than what is reflected in their measured satisfaction levels. Additionally, the study explored spatial interventions that could enhance the satisfaction with travel to university for students. The findings highlight that respondents highly value the implementation of more bike parking spaces as well as improvements in traffic flow to university. Moreover, several respondents expressed concerns regarding waiting times at traffic lights for bicycles, with some reporting waiting times of over five minutes. Furthermore, a significant number of respondents emphasized the importance of having natural surroundings during their commute to university, as it contributes to enhancing their satisfaction with travel. These results provide valuable insight for policymakers and spatial planners on how to improve the journey to university for students, aiming to enhance their subjective wellbeing. The objective is to create a pleasant and enjoyable travel experience that leaves students energized for their classes and campus activities.

It is important to acknowledge several limitations in this research that may have impacted the explanatory power of the findings and their generalizability. Firstly, the sample size of 63 valid cases, which, although exceeding the minimum requirement for statistical tests (N=30 or more), is relatively small. Such a small sample size may introduce bias and reduce the explanatory power of the results. Secondly, there was skewness observed in the distribution of age and mode of transport within the sample. This raises doubts about the representatives of the sample and therefore the results for the entire university population. For instance, there were only three cases for both walking and the car as modes of transport, making these categories highly sensitive to any chances and increasing risk of assuming false conclusions, potentially leading to a type II error (Burt, Barber and Rigby, 2009). Thirdly, it would have been desirable to employ statistical tests other than correlation analysis. Unfortunately, the sample size presented in the study made it not feasible to use other tests reliable. Lastly, the study's reliance on a single question regarding satisfaction with life may introduce inaccuracies. The use of the satisfaction with life scale by Diener et al. (1985), which consists of an assessment of someone's satisfaction with life with five items on a Likert scale, would have provided a more accurate assessment of the respondents overall life satisfaction. Having only one question may lead to respondents to provide hasty or inaccurate responses regarding their satisfaction with life.

Recommendations for future research include having a larger sample size, using the satisfaction with life scale to accurately measure the life satisfaction of participants. Next to that, further research should focus more and the different aspects of the built environment and how these aspects may influence travel behaviour or the satisfaction with travel of students who travel to university on a daily basis. Next to that, future research could focus more on the difference between satisfaction with travel and life satisfaction under the different genders.

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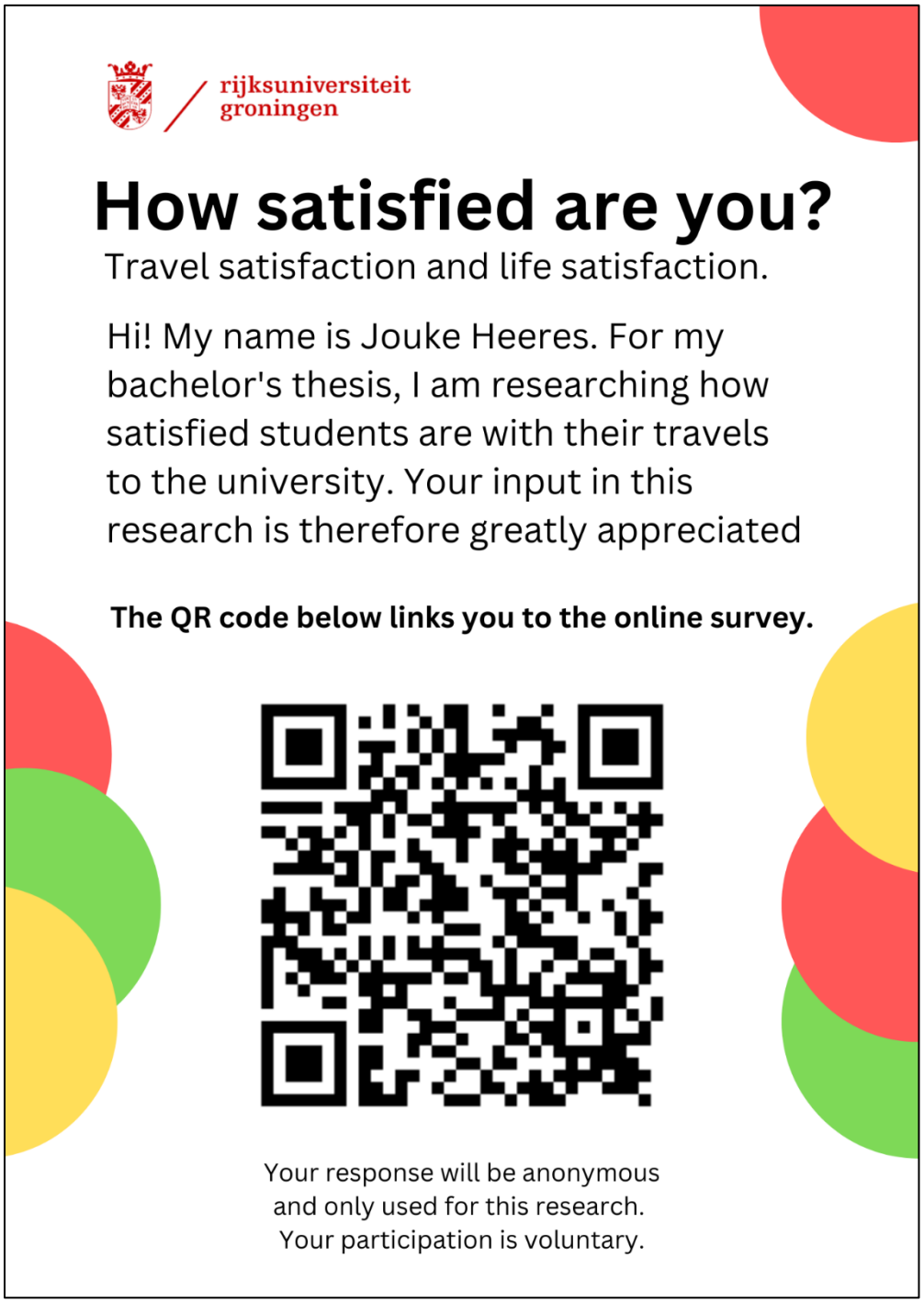
Appendix

Appendix 1: Overview survey questions

Q#	Question	Measurement level	Answer options
Sociodemographic questions			
Q1	What is you gender?	Nominal	Female Male Other Prefer not to say
Q2	What is your age?	Ordinal	16 – 18 19 – 21 21 – 23 23 – 25 25+
Q3	What faculty are you in?	Nominal	Economics and Business Behavioural and Social Sciences Theology and Religious Studies Arts Medical Sciences Law Spatial Sciences Science and Engineering Philosophy University College
General travel questions			
Q4	What mode of transport do you use to get to university?	Nominal	Walking Cycling Car Public Transport
Q6	What is your commute time to university from home?	Ordinal	0 – 10 min 10 – 20 min 20 – 30 min 30 – 60 min 60+ min
Satisfaction with travel Scale questions			
During my trip I was …			
Q6	Very distressed / Very content	Ratio	7 point semantic differential scale Ranging from -3 to 3
Q7	Very tense / Very relaxed		
Q8	Very sad / Very happy		
Q9	Very tired / Very energized		
Q10	Very bored / Very enthusiastic		
My trip …			
Q11	Was very displeasing / Very enjoyable		
Q12	Went very poorly / very smoothly		
Q13	Was the worst / best I can imagine		
Q14	I was worried I wouldn't / confident I would arrive on time		
Q15	Overall, I am satisfied with my commute to university.	Ordinal	Strongly agree Agree Somewhat agree Neither agree not disagree Somewhat disagree Disagree Strongly disagree
Spatial intervention to improve STS			
Q16	What spatial interventions do you think could improve your satisfaction with travel to university? (select all that apply)		Better sidewalks Better bike lanes More parking spots for cars

			More parking spots for bikes Better flow of traffic More nature to travel through. Quicker public transport More convenient public transport Transit hubs nearby university buildings Shuttle services from nearby neighbourhoods or transit hubs
Q17	Are there more interventions that you can think about that could improve your satisfaction with travel to university?	Open question	
Satisfaction with life questions			
Q18	I am satisfied with my life		7-point Likert scale Strongly disagree, disagree, slightly disagree, neither agree nor disagree, slightly agree, agree, strongly agree.

Appendix 2: Flyer to promote research.



Appendix 3: SPSS output

3.1 Descriptive statistics (table 3)

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	34	54,0	54,0	54,0
	Male	28	44,4	44,4	98,4
	prefer not to say	1	1,6	1,6	100,0
	Total	63	100,0	100,0	

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	19 – 21	20	31,7	31,7	31,7
	22 – 24	35	55,6	55,6	87,3
	25+	8	12,7	12,7	100,0
	Total	63	100,0	100,0	

Faculty

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Economics and Business	9	14,3	14,3	14,3
	Behavioural and Social Sciences	6	9,5	9,5	23,8
	Arts	4	6,3	6,3	30,2
	Medical Sciences	17	27,0	27,0	57,1
	Law	2	3,2	3,2	60,3
	Spatial Sciences	15	23,8	23,8	84,1
	Science and Engineering	10	15,9	15,9	100,0
	Total	63	100,0	100,0	

Mode of transport

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Walking	3	4,8	4,8	4,8
	Cycling	48	76,2	76,2	81,0
	Car	3	4,8	4,8	85,7
	Public transport	9	14,3	14,3	100,0
	Total	63	100,0	100,0	

Commute time

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0 – 10 min	24	38,1	38,1	38,1
	10 – 20 min	24	38,1	38,1	76,2
	20 – 30 min	7	11,1	11,1	87,3
	30 – 60 min	2	3,2	3,2	90,5
	60 + min	6	9,5	9,5	100,0
	Total	63	100,0	100,0	

3.2 Satisfaction with travel and life satisfaction (table 4)

Satisfaction with travel on a 7 – point Likert scale

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Extremely dissatisfied	3	4,8	4,8	4,8
	Moderately dissatisfied	3	4,8	4,8	9,5
	Slightly dissatisfied	5	7,9	7,9	17,5
	Neither satisfied nor dissatisfied	16	25,4	25,4	42,9
	Slightly satisfied	23	36,5	36,5	79,4
	Moderately satisfied	8	12,7	12,7	92,1
	Extremely satisfied	5	7,9	7,9	100,0
	Total	63	100,0	100,0	

Life satisfaction on a 7 – point Likert scale

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Extremely dissatisfied	2	3,2	3,2	3,2
	Moderately dissatisfied	1	1,6	1,6	4,8
	Slightly dissatisfied	1	1,6	1,6	6,3
	Neither satisfied nor dissatisfied	1	1,6	1,6	7,9
	Slightly satisfied	6	9,5	9,5	17,5
	Moderately satisfied	42	66,7	66,7	84,1
	Extremely satisfied	10	15,9	15,9	100,0
	Total	63	100,0	100,0	

How satisfied are you with your life? * Gender Crosstabulation

			Gender		
			Female	Male	Total
How satisfied are you with your life?	Extremely dissatisfied	Count	1	1	2
		% within Gender	2,9%	3,4%	3,2%
	Moderately dissatisfied	Count	1	0	1
		% within Gender	2,9%	0,0%	1,6%
	Slightly dissatisfied	Count	0	1	1
		% within Gender	0,0%	3,4%	1,6%
	Neither satisfied nor dissatisfied	Count	0	1	1
		% within Gender	0,0%	3,4%	1,6%
	Slightly satisfied	Count	3	3	6
		% within Gender	8,8%	10,3%	9,5%
	Moderately satisfied	Count	25	17	42
		% within Gender	73,5%	58,6%	66,7%
	Extremely satisfied	Count	4	6	10
		% within Gender	11,8%	20,7%	15,9%
Total		Count	34	29	63
		% within Gender	100,0%	100,0%	100,0%

STS * Gender Crosstabulation

			Gender		
			Female	Male	Total
STS	Extremely dissatisfied	Count	2	1	3
		% within Gender	5,9%	3,4%	4,8%
	Moderately dissatisfied	Count	1	2	3
		% within Gender	2,9%	6,9%	4,8%
	Slightly dissatisfied	Count	3	2	5
		% within Gender	8,8%	6,9%	7,9%
	Neither satisfied nor dissatisfied	Count	8	8	16
		% within Gender	23,5%	27,6%	25,4%
	Slightly satisfied	Count	12	11	23
		% within Gender	35,3%	37,9%	36,5%
	Moderately satisfied	Count	6	2	8
		% within Gender	17,6%	6,9%	12,7%
	Extremely satisfied	Count	2	3	5
		% within Gender	5,9%	10,3%	7,9%
Total		Count	34	29	63
		% within Gender	100,0%	100,0%	100,0%

How satisfied are you with your life? * Age Crosstabulation

			Age			
			19 – 21	22 – 24	25+	Total
How satisfied are you with your life?	Extremely dissatisfied	Count	0	2	0	2
		% within Age	0,0%	5,7%	0,0%	3,2%
	Moderately dissatisfied	Count	0	1	0	1
		% within Age	0,0%	2,9%	0,0%	1,6%
	Slightly dissatisfied	Count	0	0	1	1
		% within Age	0,0%	0,0%	12,5%	1,6%
	Neither satisfied nor dissatisfied	Count	0	1	0	1
		% within Age	0,0%	2,9%	0,0%	1,6%
	Slightly satisfied	Count	2	4	0	6
		% within Age	10,0%	11,4%	0,0%	9,5%
	Moderately satisfied	Count	15	22	5	42
		% within Age	75,0%	62,9%	62,5%	66,7%
	Extremely satisfied	Count	3	5	2	10
		% within Age	15,0%	14,3%	25,0%	15,9%
Total		Count	20	35	8	63
		% within Age	100,0%	100,0%	100,0%	100,0%

STS * Age Crosstabulation

			Age			
			19 – 21	22 – 24	25+	Total
STS	Extremely dissatisfied	Count	1	2	0	3
		% within Age	5,0%	5,7%	0,0%	4,8%
	Moderately dissatisfied	Count	0	3	0	3
		% within Age	0,0%	8,6%	0,0%	4,8%
	Slightly dissatisfied	Count	1	3	1	5
		% within Age	5,0%	8,6%	12,5%	7,9%
	Neither satisfied nor dissatisfied	Count	5	9	2	16
		% within Age	25,0%	25,7%	25,0%	25,4%
	Slightly satisfied	Count	8	12	3	23
		% within Age	40,0%	34,3%	37,5%	36,5%
	Moderately satisfied	Count	3	5	0	8
		% within Age	15,0%	14,3%	0,0%	12,7%
	Extremely satisfied	Count	2	1	2	5
		% within Age	10,0%	2,9%	25,0%	7,9%
Total		Count	20	35	8	63
		% within Age	100,0%	100,0%	100,0%	100,0%

How satisfied are you with your life? * Mode of transport Crosstabulation

			Mode of transport				
			Walking	Cycling	Car	Public transport	Total
How satisfied are you with your life?	Extremely dissatisfied	Count	0	1	1	0	2
		% within Mode of transport	0,0%	2,1%	33,3%	0,0%	3,2%
	Moderately dissatisfied	Count	0	1	0	0	1
		% within Mode of transport	0,0%	2,1%	0,0%	0,0%	1,6%
	Slightly dissatisfied	Count	0	1	0	0	1
		% within Mode of transport	0,0%	2,1%	0,0%	0,0%	1,6%
	Neither satisfied nor dissatisfied	Count	0	1	0	0	1
		% within Mode of transport	0,0%	2,1%	0,0%	0,0%	1,6%
	Slightly satisfied	Count	0	5	0	1	6
		% within Mode of transport	0,0%	10,4%	0,0%	11,1%	9,5%
	Moderately satisfied	Count	2	33	1	6	42
		% within Mode of transport	66,7%	68,8%	33,3%	66,7%	66,7%
	Extremely satisfied	Count	1	6	1	2	10
		% within Mode of transport	33,3%	12,5%	33,3%	22,2%	15,9%
Total		Count	3	48	3	9	63
		% within Mode of transport	100,0%	100,0%	100,0%	100,0%	100,0%

STS * Mode of transport Crosstabulation

			Mode of transport				
			Walking	Cycling	Car	Public transport	Total
STS	Extremely dissatisfied	Count	0	3	0	0	3
		% within Mode of transport	0,0%	6,3%	0,0%	0,0%	4,8%
	Moderately dissatisfied	Count	0	2	0	1	3
		% within Mode of transport	0,0%	4,2%	0,0%	11,1%	4,8%
	Slightly dissatisfied	Count	0	2	1	2	5
		% within Mode of transport	0,0%	4,2%	33,3%	22,2%	7,9%
	Neither satisfied nor dissatisfied	Count	0	12	1	3	16
		% within Mode of transport	0,0%	25,0%	33,3%	33,3%	25,4%
	Slightly satisfied	Count	1	20	0	2	23
		% within Mode of transport	33,3%	41,7%	0,0%	22,2%	36,5%
	Moderately satisfied	Count	1	6	0	1	8
		% within Mode of transport	33,3%	12,5%	0,0%	11,1%	12,7%
	Extremely satisfied	Count	1	3	1	0	5
		% within Mode of transport	33,3%	6,3%	33,3%	0,0%	7,9%
Total		Count	3	48	3	9	63
		% within Mode of transport	100,0%	100,0%	100,0%	100,0%	100,0%

How satisfied are you with your life? * Commute time Crosstabulation

			Commute time					
			0 - 10 min	10 - 20 min	20 - 30 min	30 - 60 min	60 + min	Total
How satisfied are you with your life?	Extremely dissatisfied	Count	0	0	1	0	1	2
		% within Commute time	0,0%	0,0%	14,3%	0,0%	16,7%	3,2%
	Moderately dissatisfied	Count	1	0	0	0	0	1
		% within Commute time	4,2%	0,0%	0,0%	0,0%	0,0%	1,6%
	Slightly dissatisfied	Count	0	1	0	0	0	1
		% within Commute time	0,0%	4,2%	0,0%	0,0%	0,0%	1,6%
	Neither satisfied nor dissatisfied	Count	0	0	1	0	0	1
		% within Commute time	0,0%	0,0%	14,3%	0,0%	0,0%	1,6%
	Slightly satisfied	Count	2	3	1	0	0	6
		% within Commute time	8,3%	12,5%	14,3%	0,0%	0,0%	9,5%
	Moderately satisfied	Count	17	16	4	1	4	42
		% within Commute time	70,8%	66,7%	57,1%	50,0%	66,7%	66,7%
	Extremely satisfied	Count	4	4	0	1	1	10
		% within Commute time	16,7%	16,7%	0,0%	50,0%	16,7%	15,9%
Total		Count	24	24	7	2	6	63
		% within Commute time	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%

STS * Commute time Crosstabulation

			Commute time					
			0 - 10 min	10 - 20 min	20 - 30 min	30 - 60 min	60 + min	Total
STS	Extremely dissatisfied	Count	2	0	1	0	0	3
		% within Commute time	8,3%	0,0%	14,3%	0,0%	0,0%	4,8%
	Moderately dissatisfied	Count	1	1	0	0	1	3
		% within Commute time	4,2%	4,2%	0,0%	0,0%	16,7%	4,8%
	Slightly dissatisfied	Count	1	2	1	0	1	5
		% within Commute time	4,2%	8,3%	14,3%	0,0%	16,7%	7,9%
	Neither satisfied nor dissatisfied	Count	4	5	4	1	2	16
		% within Commute time	16,7%	20,8%	57,1%	50,0%	33,3%	25,4%
	Slightly satisfied	Count	11	10	1	0	1	23
		% within Commute time	45,8%	41,7%	14,3%	0,0%	16,7%	36,5%
	Moderately satisfied	Count	3	4	0	0	1	8
		% within Commute time	12,5%	16,7%	0,0%	0,0%	16,7%	12,7%
	Extremely satisfied	Count	2	2	0	1	0	5
		% within Commute time	8,3%	8,3%	0,0%	50,0%	0,0%	7,9%
Total		Count	24	24	7	2	6	63
		% within Commute time	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%

3.3 Mann-Whitney U and Kruskal Wallis Tests

Ranks

	Gender	N	Mean Rank	Sum of Ranks
STS	Female	34	33,18	1128,00
	Male	29	30,62	888,00
	Total	63		
Overall, I am satisfied with my commute to university.	Female	34	34,51	1173,50
	Male	29	29,05	842,50
	Total	63		

Test Statistics[a]

	STS	Overall, I am satisfied with my commute to university.
Mann-Whitney U	453,000	407,500
Wilcoxon W	888,000	842,500
Z	-,552	-1,285
Asymp. Sig. (2-tailed)	,581	,199

a. Grouping Variable: Gender

Ranks

	Age	N	Mean Rank
How satisfied are you with your life?	19 – 21	20	34,00
	22 – 24	35	30,07
	25+	8	35,44
	Total	63	
STS	19 – 21	20	35,33
	22 – 24	35	29,70
	25+	8	33,75
	Total	63	

Test Statistics[a,b]

	How satisfied are you with your life?	STS
Kruskal-Wallis H	1,297	1,284
df	2	2
Asymp. Sig.	,523	,526

a. Kruskal Wallis Test

b. Grouping Variable: Age

Ranks

	Mode of transport	N	Mean Rank
How satisfied are you with your life?	Walking	3	41,17
	Cycling	48	30,82
	Car	3	30,83
	Public transport	9	35,61
	Total	63	
STS	Walking	3	55,17
	Cycling	48	32,49
	Car	3	31,00
	Public transport	9	22,00
	Total	63	

Test Statistics[a,b]

	How satisfied are you with your life?	STS
Kruskal-Wallis H	1,874	7,525
df	3	3
Asymp. Sig.	,599	,057

a. Kruskal Wallis Test

b. Grouping Variable: Mode of transport

3.4 STS and self-reported travel satisfaction (table 5)

STS: Measured satisfaction with travel

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Extremely dissatisfied	3	4,8	4,8	4,8
	Moderately dissatisfied	3	4,8	4,8	9,5
	Slightly dissatisfied	5	7,9	7,9	17,5
	Neither satisfied nor dissatisfied	16	25,4	25,4	42,9
	Slightly satisfied	23	36,5	36,5	79,4
	Moderately satisfied	8	12,7	12,7	92,1
	Extremely satisfied	5	7,9	7,9	100,0
	Total	63	100,0	100,0	

Overall, I am satisfied with my commute to university. (self-reported satisfaction with travel

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	1	1,6	1,6	1,6
	Disagree	1	1,6	1,6	3,2
	Neither agree nor disagree	5	7,9	7,9	11,1
	Somewhat agree	14	22,2	22,2	33,3
	Agree	33	52,4	52,4	85,7
	Strongly agree	9	14,3	14,3	100,0
	Total	63	100,0	100,0	

3.5 Reliability test of the nine items of the STS scale (table 6)

Reliability Statistics of PDNA

Cronbach's Alpha	N of Items
,786	2

Reliability Statistics of PAND

Cronbach's Alpha	N of Items
,753	3

Reliability Statistics of CE

Cronbach's Alpha	N of Items
,854	4

3.6 Correlation tests (table 7)

General Correlations (no split file)

		How satisfied are you with your life?	STS
How satisfied are you with your life?	Pearson Correlation	1	,158
	Sig. (2-tailed)		,216
	N	63	63
STS	Pearson Correlation	,158	1
	Sig. (2-tailed)	,216	
	N	63	63

Female Correlations[a] (split file on gender)

		How satisfied are you with your life?	STS
How satisfied are you with your life?	Pearson Correlation	1	-,081
	Sig. (2-tailed)		,650
	N	34	34
STS	Pearson Correlation	-,081	1
	Sig. (2-tailed)	,650	
	N	34	34

a. Gender = Female

Male Correlations[a] (split file on gender)

		How satisfied are you with your life?	STS
How satisfied are you with your life?	Pearson Correlation	1	,428*
	Sig. (2-tailed)		,020
	N	29	29
STS	Pearson Correlation	,428*	1
	Sig. (2-tailed)	,020	
	N	29	29

*. Correlation is significant at the 0.05 level (2-tailed).

a. Gender = Male

Walking Correlations[a] (split file Mode of transport)

		How satisfied are you with your life?	STS
How satisfied are you with your life?	Pearson Correlation	1	,991
	Sig. (2-tailed)		,084
	N	3	3
STS	Pearson Correlation	,991	1
	Sig. (2-tailed)	,084	
	N	3	3

a. Mode of transport = Walking

Cycling Correlations[a] (split file Mode of transport)

		How satisfied are you with your life?	STS
How satisfied are you with your life?	Pearson Correlation	1	,106
	Sig. (2-tailed)		,473
	N	48	48
STS	Pearson Correlation	,106	1
	Sig. (2-tailed)	,473	
	N	48	48

a. Mode of transport = Cycling

Car Correlations[a] (split file Mode of transport)

		How satisfied are you with your life?	STS
How satisfied are you with your life?	Pearson Correlation	1	,453
	Sig. (2-tailed)		,701
	N	3	3
STS	Pearson Correlation	,453	1
	Sig. (2-tailed)	,701	
	N	3	3

a. Mode of transport = Car

Public transport Correlations[a] (split file Mode of transport)

		How satisfied are you with your life?	STS
How satisfied are you with your life?	Pearson Correlation	1	,400
	Sig. (2-tailed)		,286
	N	9	9
STS	Pearson Correlation	,400	1
	Sig. (2-tailed)	,286	
	N	9	9

a. Mode of transport = Public transport

3.8 Spatial interventions that can improve travel satisfaction (table 8)

Statistics

		Better sidewalks	Better bike lanes	More parking spots for cars	More parking spots for bikes	Better flow of traffic (for example from Zernike to the city center)	More nature to travel through	Quicker public transport	More convenient public transportation options	Transit hub nearby university buildings	Shuttle services from nearby neighborhoods or transit hubs
N	Valid	63	63	63	63	63	63	63	63	63	63
	Missing	0	0	0	0	0	0	0	0	0	0
Sum		4	17	5	26	26	21	10	12	3	2