

# Public parks and the satisfaction of location of residence amongst students

• a case study of Groningen •

## Abstract

This research focuses on the effects of living close to a large public park on the satisfaction of location of residence. It is focused on happiness, perceived safety, and willingness to pay more rent to live close to a large public park. This study is a case study of the city of Groningen with the students being the research population. The research aims to get an understanding of how public parks affect the satisfaction of where students live in the city of Groningen. The research sample was collected by a quota sample through social media platforms. The data was collected through an online survey. To answer the research questions, multiple single/multiple linear regression models and an independent samples T-test have been done. The results show that students are more satisfied with the place where they are living if they live close to a large public park. The accessibility to a large public park has no effects on the overall happiness but the perceived neighbourhood safety is significant towards the overall happiness. Students are willing to pay more rent to live closer to a large public park in Groningen. The perceived safety of the public parks is not significant towards the satisfaction of the location of residence. In further research, the effects of a public park on other age groups and larger cities could be studied.

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# Table of contents

Abstract	1
1 Introduction	
1.1 Background	3
1.2 Research problem	3
1.3 Structure	4
2 Theoretical framework	
2.1 Accessibility	5
2.2 Safety	5
2.3 Income and housing prices	5
2.3 Other factors	6
2.4 Conceptual model	7
2.5 Hypothesis	8
3 Methodology	
3.1 Research method and data collection	9
3.2 Variables	10
3.3 Data analysis	10
3.4 Reflection of data analysis	12
3.5 Ethics	12
4 Results	
4.1 Data summary	13
4.2 Descriptive statistics	13
4.3 Distance to a large public park and location of residence	14
4.4 Overall happiness and distance towards a large public park	15
4.5 Paying more rent and living closer to a park	17
4.6 Neighbourhood and park safety	18
4.7 Rural/urban differences	19
5 Conclusions	20
6 References	21
7 Appendix	23

# Introduction

## Background

Public parks in cities are great for residents to escape their homes and participate in (physical) activities in a green environment (Cohen et al., 2007). With the ongoing pandemic, more Dutch residents are enjoying green areas and are moving towards rural areas which contain more green space (NOS, 2020). Public amenities like public parks could significantly impact the happiness of the place where people live and their overall happiness, as is shown in a study in Seoul, South Korea (Kim & Jin, 2018). This paper showed a significant correlation between public parks and happiness. I became interested if this is the case in the city of Groningen. If a large public park has a significant influence on the satisfaction of the location of residence amongst its residents.

Public parks are a good way for residents to participate in leisure activities and for practicing sports. A lot of physical activities are carried out in public parks which boost the physical and mental wellbeing of their visitors (Cohen et al., 2007). For people that live in urban areas, public parks are a good way to escape the 'concrete jungle'. More people are experiencing the benefits from green areas and are visiting these parks for the mental and physical benefits (Gidlöf-Gunnarsson & Öhrsröm, 2007). In contrast, public parks can attract crime which harms the surrounding neighbourhoods (Cheng & Smyth, 2015). When developing and reshaping a city, it is important to take public parks into account. To see the influence they may have on people living close to these parks.

This study takes place in the city of Groningen, with the students being the research population. The study aims to look if the accessibility towards a large public park is significant towards the satisfaction of locations amongst its students. This study will be the first study that will research how the large public parks in Groningen influence the well-being of the students in Groningen and the satisfaction of where they are living.

With this research, urban planners get a better understanding of the effects a large public park may have on students that live in a city with the characteristics of Groningen, a medium-sized city with around 230.000 citizens in its municipality (dvh, 2020). When it becomes clear how a public park affects its visitors and surrounding residents, it can be used in city planning to implement public parks to improve the well-being of its residents. City councils and municipalities can use this knowledge to implement policies to stimulate the use and creation of public parks. While more people are appreciating the benefits of green areas during this pandemic, it is important to know what effects it has and what a large public park in a city could do for its nearby residents.

## Research problem

This research aims to create a better understanding of the correlation between large public parks and the satisfaction of the location where students live in the city of Groningen. This research will also focus if large public parks affect the overall happiness of students that are living close to these parks. Groningen has two large public parks, 'Noorderplantsoen' and 'Stadspark' as can be seen in figure 1. The 'Noorderplantsoen' is closely located to the city centre (blue lines) and the 'Stadspark' is located further away from the city centre. The research focuses only on these two largest parks because research showed that larger parks are more likely to affect the happiness of their visitors (Kim & Jin, 2018). The focus of this research is established on students because they have smaller houses that often lack a garden (Huibers, 2020). Especially during this pandemic, the lack of a garden seems a problem for some students which makes them interesting in this research. For this group, a public park could have a bigger influence on their overall well-being because they lack the space for a garden at their houses. With this research, there might arise a clear correlation and understanding

about how public parks in Groningen affect the happiness of its students. The central research question will be: ‘what is the correlation between the distance towards large public parks in the city of Groningen and the satisfaction of location of residence amongst its students’. This research question will come with several sub-questions which are as follow:

- What is the effect of the distance to a large public park on the overall happiness of the students in Groningen?
  - This question will look when students live closer to a large public park, they are overall happier. This gives an idea about how students experience a close access to a large public park and how it affects their happiness.
- Would students in Groningen pay more rent to live closer (within 500m) to a large public park?
  - If students are willing to pay more rent to live closer to a large public park this shows the importance of living close to a large public park.
- How does park safety influence the satisfaction of the location of residence?
  - This question will give a perception of park safety in Groningen and could explain a negative correlation between living close to a park and the satisfaction of location of residence.

Noorderplantsoen and Stadspark in Groningen

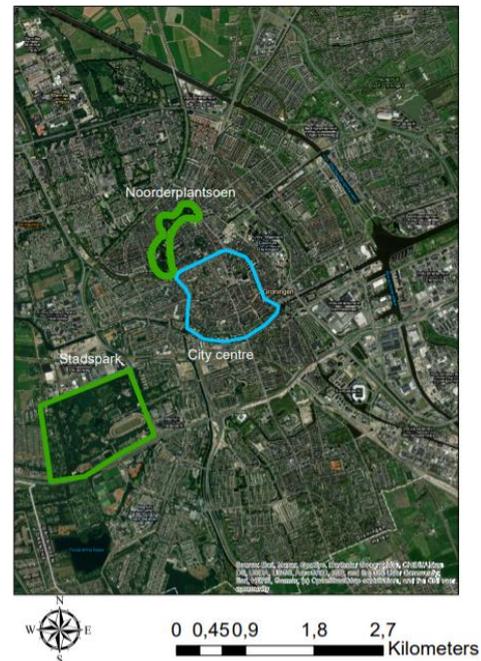


Figure 1: map of Groningen

## Structure

In the following part, all the important literature about this topic and the research questions will be addressed. Which will be followed by a conceptual model and the hypothesis for the research questions. In the methodology part the research method, data collection, and data analysis for each research question will be addressed. This will be followed by the results, after which the conclusion and discussion can be found. In the end, the literature list is stated followed by the appendix.

# Theoretical framework

## Accessibility

Public parks are often being used for leisure activities, the favourite activity of their visitors is picnicking/sitting and practicing different sports (Smiley et al., 2016). When people visit a public park more frequently, this is increasing their participation in physical activities. Studies have shown that an increase in participation in physical activities can boost the happiness and overall wellbeing of individuals (Richards et al., 2015). According to a study by Cohen et al. (2007), when people live closer to a public park, they are more likely to visit this park more frequently. So, when people live closer to a public park, this can be associated with an increase in happiness while it is easier to participate in physical activities for these people. Students in the Netherlands lack the accessibility to a garden at their houses, in which they could sit or exercise (Huibers, 2020). When students live close to a park, they will visit this park more frequently than people that live further away (Cohen et al., 2007). These public parks can be seen as large public gardens which solve the problem for students that do not have a garden at their house. People that have a garden are overall happier than people without a garden (Hu et al., 2020). This could mean that students that lack a garden but have access to a public park, are happier than students without a garden and that live further away from a park. A study in Seoul, South Korea showed that there is a positive relationship between accessibility to a public park and happiness. In such a large and densely populated city, people appreciate the greeneries of a public park which has a significant effect on their mental wellbeing and their happiness (Kim & Jin, 2018).

## Safety

Park safety is very important towards the overall comfort of a public park. When a public park is close to a neighbourhood with a higher rate of poverty, visitors tended to feel less safe in this park. Compared with a positive viewpoint on park safety when the park is close to a higher-income neighbourhood (Cohen et al., 2007). Another negative effect of a public park is that parks tend to attract crime, which could lead to people avoiding the park and making use of it. Especially when it is dark, people are more likely to be afraid to visit the park or commute through it (Westover, 1985). This harms the happiness of individuals, when people live close to a crime hotspot, this influences their happiness negatively (Cheng & Smyth, 2015). When people feel less safe in their neighbourhood this is affecting the overall well-being of its residents (Leslie & Cerin, 2008). This is leading to a negative association with the satisfaction of the location of residence. So, an increase in neighbourhood crime and unsafety leads to a decrease in the happiness of where people are living.

## Income and housing prices

For the price of a house, the location is very important, one of the indicators is the location towards a green area. A public park does overall have a positive effect on the housing prices, people like to live close to a public park and are willing to pay more money for it (Troy & Grove, 2008). This is especially significant for apartments that have been recently built. A study in Warsaw showed that housing prices are increasing when the proximity to green areas is increasing. Especially with the proximity to a public park, housing prices are increasing significantly (Trojanek et al., 2018). This is, however, only the case when the crime rate is low. When there is a high crime rate in a park, then the park does have a negative influence on the housing prices of the houses that are located close to this park. So people with a higher income are most likely to pay for houses close to a public park. It is often expected that people with a high income are overall happier. A study by Easterlin (2001), showed that people that have a higher income at the beginning of their lives are overall happier than people with lower incomes. However, this diminishes later in their life course and an increase in income does not mean people become happier while their aspirations also grow (Easterlin, 2001). Income could affect the happiness of students while they are at the beginning of their (work) life.

## Other factors

Public parks can help with creating a community feeling in a neighbourhood, people experience a sense of 'place of belonging' when they go to a public park. It is not the aesthetic of a park that is the main indicator for a community feeling in a park but the events and leisure activities that take place in a public park (Plane & Klodawsky, 2013). According to Pollard et al. (2018), a community can be created by shared gardens. When people participate in gardening in a public garden or park, this creates a feeling of community and overall well-being.

When people have more free time it is often assumed they are happier. However, Wang & Wong (2011) showed that this is not the case. From their study, we may assume that more free time does not increase the happiness of an individual. When people have more free time, they also have more time to visit a nearby park. Benita et al. (2019) showed that there is a weak correlation between park visits and happiness. It is also not stated when people have more free time that they will spend this time visiting a park, which makes the correlation between free time and happiness through park visits not likely.

Within the European Union, there are significant differences between people that live in an urban or rural environment. Research shows that people that live in a rural area are significantly more satisfied with their lives and are overall happier when the socio-economic factors are constant (Sorensen, 2011). This is not the case in other parts of the world. In general, city dwellers are overall happier than people that live in rural areas. This can be explained by better economic activities and opportunities in cities (Burger et al., 2020).

## Conceptual model

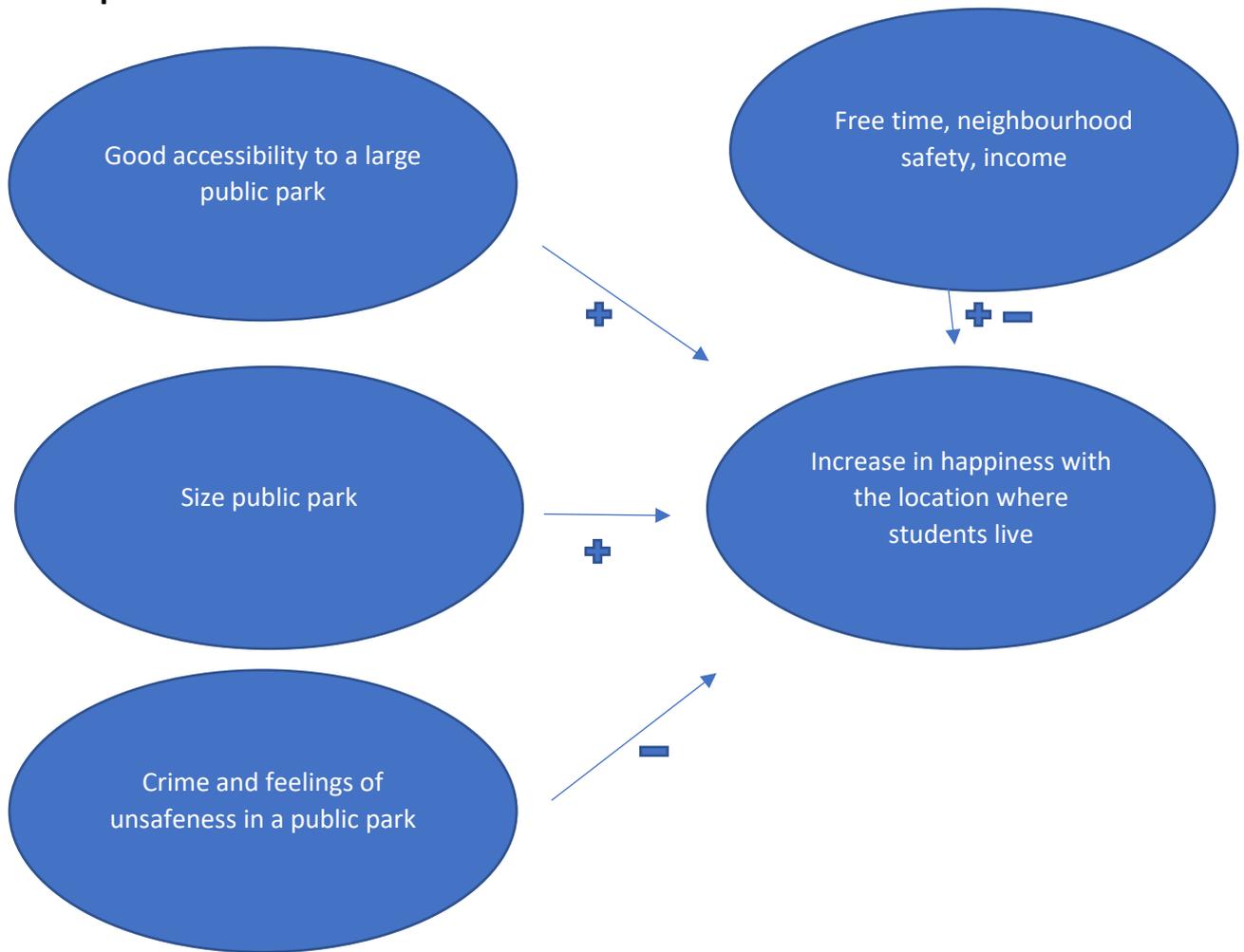


Figure 2: conceptual framework

The conceptual framework in figure 2 shows how different variables influence each other. Variables like good accessibility to a park and its size, have according to the literature a positive effect on the satisfaction of the location of residence (Kim & Jin, 2018). According to the literature, a high crime rate in a park and feelings of unsafeness in a park or neighbourhood are negative towards the happiness of people and their neighbourhood satisfaction (Cheng & Smyth, 2015; Leslie & Cerin, 2008). Several control variables may influence the perception of happiness towards the location of where students live. These are free time, neighbourhood safety, and income. These variables will be considered while conducting the research.

## Hypothesis

For the main research question and different sub-questions, the expected hypothesis are as follow:  
The main research question: *what is the correlation between the distance towards large public parks in the city of Groningen and the satisfaction of location of residence amongst its students.*

- H0 = There is no correlation between the distance towards a large public park and the satisfaction of location of residence among students in Groningen.
- The hypothesis is when students live closer to a large public park, they are more satisfied with the place where they live. According to the literature, there is a correlation between public parks and happiness (Kim & Jin, 2018). Groningen is a student city, students often lack a garden (Huibers, 2020). Therefore, it is assumed that students appreciate living close to a large public park which will increase the satisfaction of where they live when they are living close to a park.

Regarding the following sub-questions:

*What is the effect of the distance to a large public park on the overall happiness of the students in Groningen?*

- H0 = There is no effect of a large public park on the overall happiness of students in Groningen
- The hypothesis is that there is a positive correlation between living close to a large public park and the happiness of an individual. Assumed is that when students live close to a park, they will visit it more frequently which could lead to an increase in happiness (Cohen et al., 2007).

*Would students in Groningen pay more rent to live closer to a large public park?*

- H0 = Students would not pay more rent to live closer to a large public park
- The hypothesis is that students are willing to pay more rent to live closer to a large public park. According to Troy & Grove (2008), public parks have a positive effect on housing prices, which will make it likely that students are willing to pay more rent to live closer to a public park.

*How does park safety influence the satisfaction of the location of residence?*

- H0 = The perceived park safety does not influence the satisfaction of the location of residence.
- The hypothesis is that the perception towards park safety does influence the satisfaction of the location of residence. The literature showed that public parks may attract crime which affects the well-being of its nearby residents negatively (Westover, 1985; Cheng & Smyth, 2015).

# Methodology

## Research method and data collection

The research method that is used for this research is a quantitative research, to generalize a larger population in which the effect of independent variables becomes clear on a dependant variable (Punch, 2014). The independent and dependant variables are put in table 1, as well as the control variables. Three multiple linear regression models and two single linear regression models are used to answer the research questions. The research is done by an online survey, the survey is distributed amongst students that study in Groningen. Several variables have been put in the online survey to answer the research questions.

The literature showed that when people live closer to a public park, they will be happier and are more satisfied with the location of residence (Kim & Jin, 2018; Cohen et al., 2007). This is why the variables *satisfaction of place of location*, *overall happiness*, and *distance to park* are implemented in the survey. The study of Troy & Grove (2008) shows that people are willing to pay more rent to live closer to a public park, this led to the variable *willingness to pay more rent* which is implemented in the survey as a dependant variable. The literature showed that income and free time do not necessarily influence a person's happiness, these variables will still be implemented in the survey as control variables. Easterlin (2001) however, showed that in some cases income does influence happiness. The perceived park and neighbourhood safety have, according to the literature an effect on the satisfaction of location of residence (Leslie & Cerin, 2008; Cheng & Smyth, 2015). This led to the variables *neighbourhood safety*, *safety Noorderplantsoen*, and *safety Stadspark*, being implemented in the survey as independent variables. All these variables can be found in table 1.

All the variables that are used for the analysis can be found in table 1. Variables like *satisfaction of place of location* and *overall happiness* were answered on a scale from 1-10, which is a ratio variable (Long, 1980). The postal code is changed manually towards the distance towards a large public park, this created a new variable *distance towards a large public park*. To do this, the postal code has been put in google maps and the shortest route towards the 'Stadspark' or 'Noorderplantsoen' is noted in km and used for the analysis. Most of the answers are multiple-choice answers, which will give the respondents less freedom to give their answer, this could lead to random guessing but will make it easier to analyse while there is less variation in answers (Bridgemann, 1992).

The sampling strategy for this research is a quota sample. With a quota sample, people that fit in a certain group with a specific characteristic can be asked to take part in the research (Etikan & Bala, 2017). In this research, these are students that study at the Rug or Hanze. Around 50% of the students in Groningen are studying at the 'Hanze hogeschool' and the other 50% at the 'Rijksuniversiteit Groningen (Rug)' (Clickt, 2019). Any student that studies in Groningen at the Hanze or Rug will be fit to take part in the study. If 50% of the respondents are from the Hanze and the other 50% from the Rug, this will give a representative view of the students in Groningen (Etikan & Bala, 2017). The 'Hanze' is the higher education school in Groningen (Hanze, 2021). The Rug is the university of Groningen (Rug, 2021). The goal is to get at least 60 respondents from the online survey. With 60 students, there are enough respondents for a statistical analysis over the sample size (Burt et al., 2009). The online survey is spread through social media platforms like Instagram and WhatsApp. The survey can be found in the appendix.

## Variables

Dependent variables	Question	Type of variable
Satisfaction of place of location	How satisfied are you with the location where you live in Groningen? (Only look at the location and not the house itself or the people you live with)	Ratio
Overall happiness	How happy are you overall on a scale from 1-10?	Ratio
Willingness to pay more rent (euros)	How much more rent are you willing to pay per month to live closer (within 500m) to the 'Noorderplantsoen' or 'Stadspark'?	Ratio
<b>Independent variable</b>		
Distance towards a large public park	What is your postal code? (for example 9711PH) (rewritten to distance)	Ratio
Neighbourhood safety	How safe do you feel in your neighbourhood on a scale from 1-10	Ratio
Safety Stadspark	How safe do you feel in 'Stadspark' on a scale from 1-10	Ratio
Safety Noorderplantsoen	How safe do you feel in the 'Noorderplantsoen' on a scale from 1-10	Ratio
<b>Control variables</b>		
Income (euros)	What is your total monthly disposable income in euros? (this can be a job, loan or other sources like family)	Ratio
Free time (hours)	How much free time do you have per day?	Ratio
Park visits	How often do you visit the 'Noorderplantsoen' or 'Stadspark' on average per month?	Ratio
Neighbourhood safety	How safe do you feel in your neighbourhood on a scale from 1-10	Ratio
Kind of area of growing up	Would you recall this place as 'Rural' or 'Urban'	Nominal

Table 1: Variables

## Data analysis

All the variables that are used for the regression are put into a correlation table which can be found in table 18 in the appendix. This shows which independent variables might influence each other, these can be taken out of the multiple linear regression model. According to the literature, there is a difference in happiness regarding people that live in a rural or urban area (Sorensen, 2011). In the

end, there is an independent samples t-test to see if there are differences regarding the dependant variables between students that grew up in a rural or urban environment. The significance coefficient for the models is 0.05, when the significance is lower than 0.05, we may accept the alternative hypothesis and reject the null hypothesis (Burt et al., 2009). All the regression models will be checked for multicollinearity, when the tolerance is higher than 0.1 and the VIF lower than 10 we may assume there is no multicollinearity in the model (Kumari, 2008).

*What is the correlation between the distance towards large public parks in the city of Groningen and the satisfaction of location of residence amongst its students?*

To see if there is a correlation between large public parks in Groningen and the satisfaction of the location of residence amongst students, there will be done a multiple linear regression model. The dependant variable is *Satisfaction of place of location* and the explaining (independent) variables are *distance to a park, income, free time, and neighbourhood safety*.

*What is the effect of the distance to a large public park on the overall happiness of the students in Groningen?*

There will be done a multiple linear regression model. The independent variable is *Overall happiness*. The dependant variables are *distance to a park, income, free time, and neighbourhood safety*. When the significance level is lower than 0.05, we may reject the null hypothesis and accept the alternative hypothesis. The regression model will be checked for multicollinearity.

*Would students in Groningen pay more rent to live closer (within 500m) to a large public park?*

First of all, the students that already live within 500m of a large public park in Groningen are excluded from the analysis. The variable 'willingness to pay more rent' is recoded into a new variable through 'Recode into different variables' in which the cases that already live within 500m from a large public park are excluded. The cases that are left will get the label *Paymorerent* which is put into a multiple linear regression as the dependant variable. The independent variables are *distance towards a park, income, and neighbourhood safety*. If the control variables show no collinearity and the variable *distance towards a park* is significant, we may reject the null hypothesis.

*How does park safety influence the satisfaction of the location of residence?*

The means of the results regarding park safety are compared with each other. This will indicate how the students in Groningen look at the safety towards the 'Noorderplantsoen' and 'Stadspark'. If the perceived safety of the parks is significantly different, this could indicate that the students feel less safe in one of the parks. The comparison of the means will be done by 'Analyse' > 'Descriptive statistics' > 'Descriptives'. The variables: *safety Noorderplantsoen and safety Stadspark* will be put in the model.

After the comparison of the means, there are two linear regression models. The two variables mentioned above will be put into a linear regression model as the independent variables. As the dependant variables will be put the *satisfaction of place of location*. This model will show if the perceived safety of the parks influences the satisfaction of the location of residence. When this is significant with a  $p < 0.05$  this shows that the perceived safety does influence the outcome on the satisfaction of the location of residence.

*Rural/urban differences*

In the end, there will be done an independent samples T-test to see if there are differences between students that grew up in a rural or urban environment. The variables *Overall happiness, willingness to pay more rent, satisfaction of place of location, neighbourhood safety, safety Noorderplantsoen, and safety Stadspark* will be put into the model.

## **Reflection of data collection**

For the data collection, the target to get 30 respondents from the 'Hanze' was not reached. In total 23 students from the 'Hanze' filled in the online survey. Some of the respondents are not studying in Groningen at the 'Hanze' or 'Rug', these respondents are not useful for the data analysis because the research sample should exist only of students that study in Groningen. In total, 67 respondents are useful and will be taken into the analysis.

## **Ethics**

At the beginning of the online survey, it was stated that all the information will be registered anonymously and will not be distributed to third parties. The respondents were asked to fill in their postal code. If the respondent did not want to do this, this person may skip this question and fill in the distance towards a large public park manually. In this way, the privacy of the respondent is taken into account. There was chosen to ask for the postal code instead of a full address. In this way the exact address would stay anonymous, this secures the privacy of the respondents.

## Results

### Data summary

The research sample does not only consist of students that study at the Hanze and the Rug. In total 23 Hanze students and 44 Rug students filled in the survey. 4 people responded that they did a study in Groningen, but not at the Hanze or Rug. The other 9 respondents do not study in Groningen but do live in the city. People that filled in the questionnaire and do not study at the Rug or Hanze have been excluded from the data analysis, which left 67 useful respondents for the data analysis. In table 2 all the different groups of respondents are stated. In the appendix at table 18, there is a correlations table. With this table, significant and strong correlations become clear between the independent variables. This led that some of the independent variables have been excluded in the regression model because they are significant towards other independent variables, which makes the regression model less strong (Burt et al. 2009).

Respondents	N
Hanze	23
Rug	44
Other	4
No	9
Total	80

Table 2: Data

### Descriptive Statistics

In table 3 all the descriptives can be found from the variables that have been used for the data analysis. The table shows the number of cases (N), the minimum answer (Minimum), the maximum answer (Maximum), the overall mean of the respondents, which is calculated by the sum of the answers divided by the cases (Mean) and the standard deviation which tells us something about how close the answers are compared to the mean (Std Deviation). When the standard deviation is closer to zero, this suggests that all the answers are close to the mean of the variable (Burt et al., 2009).

	N	Minimum	Maximum	Mean	Std Deviation
Distance to park (km)	67	0.13	5.50	1.4058	0.99884
Neighbourhood safety	67	6	10	8.48	1.005
Safety Noorderplantsoen	67	6	10	8.42	0.972
Safety Stadspark	67	5	10	7.78	1.253
Overall happiness	67	6	10	8.04	0.976
Satisfaction of place of location	67	1	10	7.82	1.953
Willingness to pay more rent (euros)	48	0.00	50.00	16.6667	17.66513
Income (euros)	64	200.00	1600.00	971.8750	356.11161
Free time (hours)	67	1.50	3.50	2.9030	0.75998
Park visit	66	0	7	4.6515	2.2221

Table 3: Descriptive statistics of the main variables

## Distance to a large public park and satisfaction of location of residence

what is the correlation between the distance towards large public parks in the city of Groningen and the satisfaction of location of residence amongst its students?

H0 = There is no correlation between the distance towards a park and the satisfaction of the location of residence amongst students in Groningen.

All the independent variables and the dependant variables have been put into a multiple linear regression. The Anova model in table 5 shows that the model is significant,  $0.000 < 0.05$ , there are independent variables that are significant towards the dependant variable. The R square of the model summary is 0.309 (table 4), 30.9% of the variance of the dependant variable can be explained by the independent variables (Burt et al., 2009). The tolerance is larger than 0.1 and the VIF is smaller than 10 (table 6) which indicates there is no multicollinearity (Kumari, 2008).

Both the variables *Income* (0.600) and *Free time* (0.220) do not show any significance towards the dependant variable *satisfaction of place of location*. The variables *Distance to park* and *Neighbourhood safety* are significant with a respective significance of 0.000 and 0.027, which are both lower than 0.05 (table 6). So, we can reject the null hypothesis and accept the alternative hypothesis. The regression coefficient of *Distance to park* is negative and is -1.082. This means that with every km that someone lives further away from a large public park, the satisfaction of place of location decreases by 1.082. The regression coefficient of *Neighbourhood safety* is 0.491, this means that when the perceived neighbourhood safety increases by 1, their satisfaction of location of residence increases by 0.491. This table shows that the hypothesis is true, and we can assume that students experience a higher satisfaction of their location of residence when they are living closer to the 'Noorderplantsoen' or 'Stadspark' in Groningen. The other significant variable shows there is a positive correlation between *neighbourhood safety* and *satisfaction of place of location*. According to the study of Cohen et al. (2007), it is expected that there is an increase in happiness when people live closer to a public park.

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,556 <sup>a</sup>	,309	,262	1,695
a. Predictors: (Constant), Neighbourhood safety, Income, Free time, Distance to park				

Table 4: Model summary satisfaction of place of location

ANOVA <sup>a</sup>						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	75,913	4	18,978	6,603	,000 <sup>b</sup>
	Residual	169,572	59	2,874		
	Total	245,484	63			
a. Dependent Variable: Satisfaction of place of location						
b. Predictors: (Constant), Neighbourhood safety, Income, Free time, Distance to park						
Table 5: Anova model						

Table 5: Anova model satisfaction of place of location

Coefficients <sup>a</sup>								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	4,400	2,038		2,159	,035		
	Distance to park	-1,082	,231	-,518	-4,686	,000	,959	1,043
	Income	,000	,001	-,057	-,528	,600	,997	1,003
	Free time	,345	,278	,134	1,240	,220	,996	1,004
	Neighbourhood safety	,491	,216	,251	2,268	,027	,959	1,043

a. Dependent Variable: Satisfaction of place of location

Table 6: Coefficients satisfaction of place of location

## Overall happiness and distance to a large public park

*What is the effect of the distance to a large public park on the overall happiness of the students in Groningen?*

H<sub>0</sub> = There is no effect of large public parks on the overall happiness of students in Groningen

The variables that relate to this sub-question have been put into a 'bivariate correlations' model to see what the significance is between the variables. The variables *overall happiness, distance to a park, free time, income, neighbourhood safety, and park visits* have been put into this model. There was a significance between the independent variables *distance to a park* and *park visit* with a Pearson correlation of -0.285, see table 18 in the appendix. This is close to a moderately significant correlation which is why *park visit* is excluded from the regression model because it can influence the results (Ratner, 2009). The Anova model (table 8) of the multiple linear regression shows that the model is significant with  $p = 0.000 < 0.05$ . The R square of the model in table 7 is 0.319, which indicates that 31.9% of the variance of the dependant variable can be explained by the variances of the independent variables (Burt et al., 2009). In the model there is no multicollinearity, the tolerance is higher than 0.1 and the VIF is smaller than 10 for all the variables, which shows that there are no signs of multicollinearity (Kumari, 2008).

The multiple linear regression model shows no significance between the *distance to a park* and *overall happiness* (0.155). The model does show in table 9 that there is a significant relation between *neighbourhood safety* and *overall happiness* with a p-value of 0.000 which is smaller than 0.05. The regression coefficient is 0.472. This means that with an increase of perceived neighbourhood safety by 1, the overall happiness increases by 0.472. The other independent variables *free time* (0.450) and *income* (0.147) do not show any significance. Because the *distance to park* is not significant, we do accept our null hypothesis. It was expected according to the literature that the distance to a large public park would be significant towards the overall happiness (Cohen et al., 2007).

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,565 <sup>a</sup>	,319	,273	,852
a. Predictors: (Constant), Neighbourhood safety, Income, Free time, Distance to park				

Table 7: Model summary overall happiness

ANOVA <sup>a</sup>						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	20,046	4	5,012	6,906	,000 <sup>b</sup>
	Residual	42,813	59	,726		
	Total	62,859	63			
a. Dependent Variable: Overall happiness						
b. Predictors: (Constant), Neighbourhood safety, Income, Free time, Distance to park						

Table 8: Anova model overall happiness

Coefficients <sup>a</sup>								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	3,064	1,024		2,991	,004		
	Distance to park	,167	,116	,158	1,439	,155	,959	1,043
	Income	,000	,000	,158	1,469	,147	,997	1,003
	Free time	,106	,140	,082	,761	,450	,996	1,004
	Neighbourhood safety	,472	,109	,476	4,342	,000	,959	1,043
a. Dependent Variable: Overall happiness								

Table 9: Coefficients overall happiness

## Paying more rent and living closer to a park

*Would students in Groningen pay more rent to live closer to a large public park?*

H0 = Students would not pay more rent to live closer to a large public park

The variable *pay more rent* will be put as the dependant variable in a multiple linear regression model. The independent variables are *income*, *distance to park*, and *Neighbourhood safety*. The variables *safety Noorderplantsoen* and *safety Stadspark* are not included in the regression. As can be seen in table 18 in the appendix, the variables *safety Noorderplantsoen* and *safety Stadspark* are significant towards respective *distance to park* and *neighbourhood safety*. They have a Pearson correlation coefficient of 0.284 (*safety Noorderplantsoen*) and 0.483 (*safety Stadspark*), which are over or close to a moderate relation that can influence the outcome of the model (Ratner, 2009). The r square of the model is 0.219, as can be seen in table 10. 21.9% of the variance of the dependant variable can be explained by the variance of the independent variables. According to the Anova model (table 11), the model is significant with a significance level of 0.013. In the model, there is no multicollinearity because the tolerance is higher than 0.1 and the VIF is lower than 10 as can be seen in table 12 (Kumari, 2008).

The multiple linear regression model shows that the independent variable *distance to park*, significant is with a value of 0.003 which is lower than 0.05. So, we reject the null hypothesis and accept the alternative hypothesis. The other variables *income* and *neighbourhood safety* are not significant. The regression coefficient is 8.643 which is positive. This means that when students live 1km further away from a large public park in Groningen, they are willing to pay 8.643 euros more rent to live closer (within 500m) to a large public park.

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,468 <sup>a</sup>	,219	,165	16,31087
a. Predictors: (Constant), Neighbourhood safety, Income, Distance to park				

Table 10: Model summary willingness to pay more rent

ANOVA <sup>a</sup>						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3215,403	3	1071,801	4,029	,013 <sup>b</sup>
	Residual	11439,916	43	266,045		
	Total	14655,319	46			
a. Dependent Variable: Paymorerent						
b. Predictors: (Constant), Neighbourhood safety, Income, Distance to park						

Table 11: Anova model willingness to pay more rent

Coefficients <sup>a</sup>								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	26,051	20,379		1,278	,208		
	Distance to park	8,643	2,790	,441	3,098	,003	,894	1,118
	Income	-,009	,007	-,182	-1,347	,185	,995	1,005
	Neighbourhood safety	-1,761	2,349	-,107	-,750	,457	,898	1,114

a. Dependent Variable: Paymorerent

Table 12: Coefficients, willingness to pay more rent

## Neighbourhood and park safety

*How does park safety influence the satisfaction of the location of residence?*

H0 = The perceived park safety does not influence the satisfaction of location of residence

Looking at the mean park safety in table 3 there is a difference between the perceived safety in the 'Stadspark' (7.78) and 'Noorderplantsoen' (8.42). The respondents mentioned feeling safer in the 'Noorderplantsoen' than in the 'Stadspark'. The variables *safety Noorderplantsoen*, and *safety Stadspark* are moderately, statistically significant to each other with Pearson correlations of 0.601 as can be seen in table 18 in the appendix (Ratner, 2009). Therefore, two single linear regression models have been done to see the influence of the perceived safety on the satisfaction of the location of residence. As can be seen in the two models (table 13, 14) below, none of the independent variables are significant (lower than 0.05) towards the *satisfaction of place of location* with significance levels of 0.701, and 0.595. This means that we accept the null hypothesis and can conclude that the perceived park safety does not influence the satisfaction of the location of residence.

Coefficients <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	8,630	2,111		4,089	,000
	Safety Noorderplantsoen	-,096	,249	-,048	-,386	,701

a. Dependent Variable: Satisfaction of place of location

Table 13: Coefficients safety Noorderplantsoen

Coefficients <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	8,623	1,519		5,675	,000
	Safety Stadspark	-,103	,193	-,066	-,534	,595

a. Dependent Variable: Satisfaction of place of location

Table 14: Coefficients safety Stadspark

## Rural/urban differences

For the differences between students that grew up in a rural or urban environment, an independent samples t-test was conducted. The tables for the group statistics and independent sample T-test can be found in tables 16 and 17 in the appendix. All the variables that were put in the independent samples t-test can be found in table 15. The model did not show any significance, the significance levels are put in table 15 and do not show any significance. So there is no significant difference between students that grew up in a rural or urban environment while comparing these variables.

Variable	Significance level
Overall happiness	0.196
Willingness to pay more rent	0.106
Satisfaction of place of location	0.241
Neighbourhood safety	0.583
Safety Noorderplantsoen	0.627
Safety Stadspark	0.837

Table 15: significance levels independent sample T-test

## Conclusions

The conclusion for the main research question: 'what is the correlation between the distance towards large public parks in the city of Groningen and the satisfaction of location of residence amongst its students'. There is a negative, significant correlation between the distance towards a large public park and the satisfaction of location of residence. This shows that when people live closer to a large public park in the city of Groningen, they are more satisfied with the location of where they are living. This is in line with the expected hypothesis which was based on the existing literature. Kim & Jin (2018) showed that there was a correlation between the accessibility to a public park and happiness.

Several sub-questions attributed to the results of this paper. Concluding from the results, there is no correlation between the distance towards a large public park and the overall happiness, students in Groningen are not happier when they live closer to a park. This is contradicting to the expected hypothesis for this topic. The results did show however that the perceived neighbourhood safety does influence the overall happiness. Leslie & Cerin (2008) showed in the literature that neighbourhood safety influences the overall happiness. The hypothesis is contradicting with the paper of Kim & Jin (2018), as the distance towards a park does not influence the overall happiness. This research showed that people are willing to pay more rent to live closer to a large public park. The literature already showed that housing prices are higher close to parks, so it was expected that students are willing to pay more rent to live closer to a large public park (Troy & Grove, 2008). This is in line with the expected hypothesis.

The 'Noorderplantsoen' is perceived as safer compared to the 'Stadspark'. For both parks, the perceived safety does not influence the satisfaction of the location of residence. It was expected that the perceived park safety would influence the satisfaction of location of residence as the literature mentioned this correlation (Westover, 1985; Cheng & Smyth, 2015). There are no significant differences in the dependant variables between students that grew up in a rural or urban environment.

Several points could be improved in further research. First of all, with the question 'how safe do you feel in the 'Noorderplantsoen', there should have been mentioned if this regards to the safety during the day, night or overall. One of the respondents mentioned that this was unclear, and he/she had different viewpoints on the perceived park safety during the day and night. The research sample aimed to get at least 30 respondents from the RUG and 30 from the Hanze. I did not manage to get 30 respondents from the Hanze. However, I do not think this had a significant influence on my results because both groups are students and the only difference is the level of education.

In future studies, it would be useful to look at the effects of the close accessibility to a public park compared to other age groups. In this way, planners can see if these results apply for students only or also amongst other age groups. It would also be useful to look at the effects of a public park in larger cities than Groningen. In future research, there could be done a qualitative study that looks into the effects of the accessibility towards a large public park on the overall happiness. This study could look more into what features of a public park in Groningen stimulate happiness and which are negatively associated with happiness. Because this study did not show any significance between the accessibility to a public park and happiness but the literature did (Kim & Jin, 2018).

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## Appendix

Group Statistics					
	Kindofareanew	N	Mean	Std. Deviation	Std. Error Mean
Overall happiness	,00	28	8,25	1,041	,197
	1,00	33	7,91	,980	,171
Paymorerent	,00	21	12,8571	12,70545	2,77256
	1,00	23	21,3043	20,51703	4,27810
Neighbourhood safety	,00	28	8,43	1,069	,202
	1,00	33	8,58	1,001	,174
Satisfaction of place of location	,00	28	8,11	1,197	,226
	1,00	33	7,55	2,386	,415
Safety Noorderplantsoen	,00	28	8,36	1,026	,194
	1,00	33	8,48	1,004	,175
Safety Stadspark	,00	28	7,86	1,407	,266
	1,00	33	7,79	1,166	,203

Table 16: Group statistics independent samples T-test

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Overall happiness	Equal variances assumed	,057	,813	1,316	,193	,341	,259		-,177	,859
	Equal variances not assumed			1,309	56,107	,196	,341	,260	-,181	,862
Paymorerent	Equal variances assumed	5,609	,023	-1,623	42	,112	-8,44720	5,20475	-18,95081	2,05640

	Equal variances not assumed			- 1,65 7	37,1 52	,106	- 8,44720	5,09 796	- 18,7752 2	1,880 81
Neighborhood safety	Equal variances assumed	,1 2 4	,726	- ,555	59	,581	-,147	,265	-,678	,384
	Equal variances not assumed			- ,552	55,9 75	,583	-,147	,267	-,682	,387
Satisfaction of place of location	Equal variances assumed	6, 6 7 4	,012	1,13 0	59	,263	,562	,497	-,433	1,556
	Equal variances not assumed			1,18 8	48,7 16	,241	,562	,473	-,389	1,512
Safety Noorden plantsoenen	Equal variances assumed	,0 0 0	,998	- ,490	59	,626	-,128	,261	-,649	,394
	Equal variances not assumed			- ,489	56,9 61	,627	-,128	,261	-,650	,395
Safety Stadspark	Equal variances assumed	,8 0 8	,372	,210	59	,834	,069	,329	-,590	,728
	Equal variances not assumed			,207	52,5 82	,837	,069	,334	-,602	,740

Table 17: independent samples T-test

### Correlations

		Neighbourhood safety	Satisfaction of place of location	Safety Noorderplantsoen	Safety Stadspark	Distance to park	Overall happiness	Income	Payment or rent	Free time	Parkvisit
Neighbourhood safety	Pearson Correlation	1	,152	,506**	,483**	,117	,503**	,004	,033	,062	,186
	Sig. (2-tailed)		,219	,000	,000	,345	,000	,972	,823	,621	,135
	N	67	67	67	67	67	67	64	48	67	66
Satisfaction of place of location	Pearson Correlation	,152	1	-,048	-,066	-,443**	-,123	-,082	-,476**	,172	,002
	Sig. (2-tailed)	,219		,701	,595	,000	,322	,521	,001	,164	,989
	N	67	67	67	67	67	67	64	48	67	66
Safety Noorderplantsoen	Pearson Correlation	,506**	-,048	1	,601**	,284*	,379**	,118	,183	,015	,097
	Sig. (2-tailed)	,000	,701		,000	,020	,002	,351	,214	,906	,436
	N	67	67	67	67	67	67	64	48	67	66
Safety Stadspark	Pearson Correlation	,483**	-,066	,601**	1	,163	,442**	,078	-,082	,017	,004
	Sig. (2-tailed)	,000	,595	,000		,187	,000	,539	,579	,894	,973
	N	67	67	67	67	67	67	64	48	67	66
Distance to park	Pearson Correlation	,117	-,443**	,284*	,163	1	,236	,042	,398**	-,052	-,285*
	Sig. (2-tailed)	,345	,000	,020	,187		,054	,740	,005	,677	,020

	N	67	67	67	67	67	67	64	48	67	66
Overall happiness	Pearson Correlation	,503**	-,123	,379**	,442**	,236	1	,164	-	,098	,120
	Sig. (2-tailed)	,000	,322	,002	,000	,054		,194	,834	,431	,337
	N	67	67	67	67	67	67	64	48	67	66
Income	Pearson Correlation	,004	-,082	,118	,078	,042	,164	1	-,210	-,029	-,215
	Sig. (2-tailed)	,972	,521	,351	,539	,740	,194		,157	,821	,091
	N	64	64	64	64	64	64	64	47	64	63
Payment	Pearson Correlation	,033	-,476**	,183	-,082	,398**	-,031	-,210	1	-,159	,124
	Sig. (2-tailed)	,823	,001	,214	,579	,005	,834	,157		,282	,404
	N	48	48	48	48	48	48	47	48	48	47
Freetime	Pearson Correlation	,062	,172	,015	,017	-,052	,098	-,029	-,159	1	-,096
	Sig. (2-tailed)	,621	,164	,906	,894	,677	,431	,821	,282		,443
	N	67	67	67	67	67	67	64	48	67	66
Participation	Pearson Correlation	,186	,002	,097	,004	-,285*	,120	-,215	,124	-,096	1
	Sig. (2-tailed)	,135	,989	,436	,973	,020	,337	,091	,404	,443	
	N	66	66	66	66	66	66	63	47	66	66
**. Correlation is significant at the 0.01 level (2-tailed).											
*. Correlation is significant at the 0.05 level (2-tailed).											

## Appendix

Table 18: Correlations table

## Questions online survey:

- 1 What is your age?
  - .....
- 2 Do you study in Groningen?
  - Yes, at the Hanze
  - Yes, at the Rug
  - Yes, other
  - No
- 3 What is your postal code? (for example 9711PH)
- 4 You can skip this question if you already entered your postal code. How far do you live closest from the 'Noorderplantsoen' or 'Stadspark' in km (2.1 for example).
  - .....
- 5 How often do you visit the 'Noorderplantsoen' or 'Stadspark' on average per month?
  - 0 times
  - 1 – 3 times
  - 4 – 6 times
  - More than 6 times
- 6 What is your total monthly disposable income in euros? (this can be a job, loan or other sources like family)
  - 0 – 200
  - 201 – 400
  - 401 – 600
  - 601 – 800
  - 801 1000
  - 1001 – 1200
  - 1201 – 1400
  - More than 1400
  - Prefer not to say
- 7 How much free time do you have per day?
  - 0 – 1 hour
  - 1 – 2 hours
  - 2 – 3 hours
  - More than 3 hours
- 8 In what kind of area did you grow up?
  - Village (less than 10.000 people)
  - Small town (less than 50.000 people)
  - Medium sized city (50.000 – 250.0000 people)
  - Large city (More than 250.000 people)
- 9 Would you recall this place as 'Rural' or 'Urban'?
  - Rural
  - Urban
  - Neither
- 10 Do you own a dog or have you owned a dog in the past?

- I have a dog
- I used to have a dog
- I have never had a dog
- 11 How safe do you feel in your neighbourhood on a scale from 1-10
  - 1 = Extremely unsafe
  - 10 = Extremely safe
- 12 How safe do you feel in the 'Noorderplantsoen' on a scale from 1-10
  - 1 = Extremely unsafe
  - 10 = Extremely safe
- 13 How safe do you feel in 'Stadspark' on a scale from 1-10
  - 1 = Extremely unsafe
  - 10 = Extremely safe
- 14 How satisfied are you with the location where you live in Groningen? (Only look at the location and not the house itself or the people you live with)
  - 1 = Extremely unsatisfied
  - 10 = Extremely satisfied
- 15 Why are you satisfied with the place where you live in Groningen?
  - .....
- 16 Why are you unsatisfied with the place where you live in Groningen?
  - .....
- 17 How much more rent are you willing to pay per month to live closer (within 500m) to the 'Noorderplantsoen' or 'Stadspark'?
  - 0 euro's
  - 1 – 10 euro's
  - 11 – 20 euro's
  - 21 – 30 euro's
  - 31 – 40 euro's
  - More than 40 euro's
  - I already live within 500 m from the 'Noorderplantsoen' or 'Stadspark'
- 18 How happy are you overall on a scale from 1-10?
  - 1 = Extremely unhappy
  - 10 = Extremely happy
- 19 Do you have any other remarks about the survey?
  - .....