BACHELOR HUMAN GEOGRAPHY, URBAN & REGIONAL PLANNING

URBAN BLUE AND GREEN SPACES

SUMMER 2020

Investigation in how the personal perceived safety in city parks is influenced, by its characteristics, in the city Groningen.

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Date:	10th of July 2020
Words:	6511

Abstract

Being in urban green spaces contributes to the well-being of people, therefore it is important that the threshold to visit these places is low. This is influenced by the personal perceived safety visitors have when going to city parks. This research will focus on two city parks in Groningen, the 'Noorderplantsoen' and 'Stadspark'. An investigation in how the perceived personal safety is in these city parks and contributing factors are reached via literature review, quantitative data and qualitative data. Conducting questionnaires and interviews, the relation and correlation are tested between safety, the independent variable, and the dependent variables, density, visual accessibility and physical accessibility. Results indicate a relation between safety, density, visual accessibility and physical accessibility. Also the direction of the relation, found with correlation, confirms that if safety increases, then the density, visual and physical accessibility decrease. Concluding, in order to feel safe people prefer a low density, easy visual accessibility and an easy physical accessibility. Furthermore, external factors such as the social dynamic, image of an area and time of visiting all contribute to the perceived personal safety.

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1. Introduction

Being in urban green contributes to the well-being of people (Hartig et al., 2003; Berman et al., 2008) therefore, it is important for people that the threshold to visit parks is low. When the perceived personal safety is high, people are more likely to visit parks thus, these parks have a higher preference (Lis et al., 2019). Although a lot of research is done on perceived personal safety regarding urban green spaces, there is no research done yet in the city parks of Groningen. Although, 16% of inhabitants of Groningen feels unsafe in their neighbourhood (OIS, 2019). Groningen has an overrepresentation of the age group of 20-25 years, this contains 15.5% of the total inhabitants. The average in the Netherlands is 6.0% (CBS, 2020). This makes Groningen an interesting case for this study. This research will focus on two parks, the 'Noorderplantsoen' and 'Stadspark', both located in the city center of Groningen. The aim of this research is to investigate in how the personal safety is perceived and which characteristics contribute in these parks. Moreover, the differences and similarities between these sites are analysed. When looking at the neighbourhoods where the city parks are located, 9% of inhabitants feels unsafe (OIS, 2019). A broad age group makes use of the parks for several activities. Therefore, the research group will consist of people between 16 years old and 65 years old. Due to the intense use of the parks for several activities, such as sports, transport routes or creative time spending, and the contribution of visiting urban green for personal health, it is important for people to feel safe. The focus in this research is on the vegetation density, which influences the level of concealment, visual accessibility and physical accessibility. These three factors influence the perceived personal safety. The main research question is formulated as follows: "*What characteristics of city parks in Groningen influence the perceived personal safety of visitors?"*. This question will be answered through literature research, quantitative and qualitative data gathering and analyses. This is further explained in the methodology section. These findings can provide a guideline on how to set up or design future city parks with high perceived safety, to stimulate visiting urban green. Further research can be done on how the parks itself can be improved or changed to contribute to the perception of safety and which external factors play a role.

The subsequent sections are ordered as follows. In the theoretical section the found literature is discussed and concepts are examined. Thereafter, in the methods section, the setup of the research approach is explained. A combination of quantitative data, a questionnaire, with qualitative data, in-depth interviews, will provide detailed insights on the perceived personal safety. The discussion and results section presents the results of questionnaires containing the relation and correlation between the variables. Analysed together with the interviews, to see whether these findings support each other. Finally, study limitations are identified and a conclusion is drawn by summarizing the influential characteristics on perceived personal safety in city parks in Groningen and future research needs.

2. Theoretical Insights

2.1 Literature review

Being in urban green provides many benefits and contributes to the well-being and health of people (Berman et al., 2008; Fuller et al., 2007; Hartig et al., 2003). Moreover, urban parks stimulate social connections and are used as meeting places (Kuo et al., 1998; Sullivan et al., 2004). Perceived personal safety is an experienced feeling and connected to the fear of crime. Fear is associated with the presence of woodland vegetation in parks by Jacobs (1961), Jorgensen and Anthopoulou (2007). The character of vegetation can be an important factor contributing to perceived personal safety (Jansson et al., 2013). Four main aspects of how city parks affect perceived personal safety are identified in several studies: landscape design, possibilities for overview and control, vegetation density and vegetation character and maintenance (Koskela and Pain, 2000; Madge, 1997). The perception of safety links together with the preference in city parks, this influences whether and how often parks are visited (Lis et al., 2019). Parks with dense, wild-looking trees and little human intervention are perceived as less safe due to dense understory that restricts views and offers concealment (Jorgensen, 2004). Open spaces are positively

related with visitors preferences (Yao et al., 2012). In contrast, other studies have shown that dense vegetation is preferred (Harris et al., 2018). Due to a greater sense of mystery (Herzog, 2007) and higher ecological values (Fuller et al., 2007). Furthermore, paths, lawns and other forms that can facilitate for movement and possibility to escape contribute to the perceived personal safety (List et al., 2019).

Research also highlights gender differences in perceived personal safety. Women describe themselves as less safe compared to men when passing dense vegetation (Jorgensen et al, 2002). Moreover, women pay more attention to elements in the physical environment and tend to avoid areas with poor lightening and dense vegetation, while men's fear is more constant and less environment-related (Bronwlow, 2005; Madge, 1997). Furthermore, social constructions, such as the image of an area can influence and relate to the personal perceived safety (Koskela & Pain, 2000; Kullberg, 2010). The perceived personal safety indicates a relationship with parks in areas that are considered as dangerous (Lis et al., 2019).

2.2 Influential Factors

The definition of perceived safety is an experienced feeling. Therefore the phenomenon *perceived environmental safety* defined by Rijswijk et al. (2016, p. 2) is used: "The perceptual judgement of the safety of an environment using site-specific, immediate and safety-related physical information from that environment". The sense of threat in city parks is affected by spatial features, therefore the *Nasar/Fisher model* built on Appleton's prospect-refuge theory is used (Appleton, 1975; Appleton, 1984). This theory assumes that the sense of threat is influenced by three spatial factors: refuge (concealment), escape (entrapment) and prospect (Fisher & Nasar, 1992). Density, visual accessibility and physical accessibility are three spatial factors linked with the ones in the Nasar-Fisher model and are used in this research. Adding to that is the theory of Lis et al. (2019) stating *Density* is another important factor regarding vegetation and contributes to the visual accessibility and physical accessibility. Density is how dense or covering the vegetation is at eye level or between knee and eye level (Coles and Bussey, 2000; Jorgensen et al., 2002; Bjerke et al., 2006; Herzog and Bryce, 2007). This can be linked with the effectiveness of concealment used in the Nasar/Fisher model. *Effectiveness of concealment* is defined by Lis et al. (2019) as characteristics of shrubs and trees that determine their effectiveness as a potential hiding place for a person or a group of people. *Visual accessibility* is defined as the high visual permeability of a site and *physical accessibility* describes the possibility of entering a site (Hoffman et al., 2012). Both concepts are used as a predictor of preference (Fischer, 2006; Hagerhall, 2000; Herzog et al., 2003; Gundersen & Frivold, 2008). Together with gender differences, these theories and concepts are combined in Figure 1, the conceptual model, presented below.

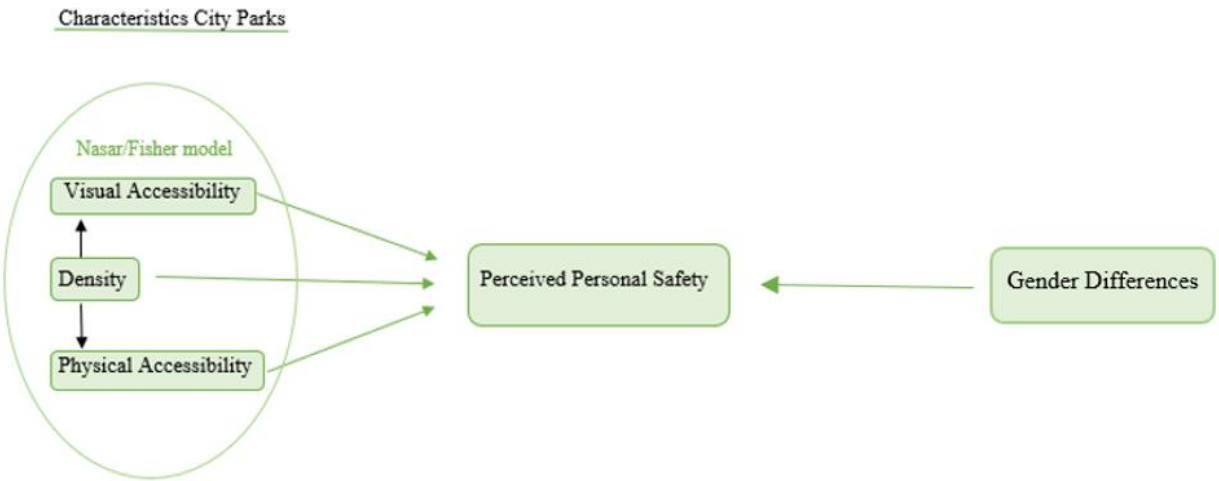

Figure 1. Conceptual model

2.3 Hypotheses

It is expected that the density of vegetation, and thus the effectiveness of concealment, influences the perception of safety. Furthermore, supported by Lis et al. (2019) and Jorgensen and Anthopoulou (2007), visual accessibility and physical accessibility also contribute to perceived safety. Concluding, that a city park with a high perception of safety, will have a low density, easy visual accessibility and an easy physical accessibility. Contrary, if a low perception of safety is analysed, a dense vegetation, hard visual accessibility and a hard physical accessibility are expected. The literature review gave insights in the distinction between men and women. Overall women tend to have a lower feeling of safety compared to men (Jorgensen et al., 2002). Therefore, this factor is taken into account as a controlling variable for the outcomes of the study. External factors are not the focus in this study but are expected to influence the perceived safety. Such as the activity, social control, weather, or time of visiting the park. This is highlighted in the in-depth interviews and taken into account although not focused on.

3. Methodology

3.1 Parks

For this study the characteristics of two parks are examined. The location of the parks are presented in Figure 2. The parks chosen are 'Noorderplantsoen', known as the inner city park (1, Figure 2) and 'Stadspark', known as the bigger city park outside the city center (2, Figure 2). Due to the long history of both parks and being named as national and municipal monuments these parks are chosen as interesting cases for this study. Furthermore, the size of the parks differ, Noorderplantsoen is 20 hectares big and Stadspark is 140 hectares big (GroningenLife, 2020). According to Gozalo et al. (2019) size influences the perception and use of the parks.

Figure 2. Map location parks (source: Esri, 2020)

3.2 Quantitative: Questionnaire

For quantitative data questionnaires are conducted (Appendix 1). The questionnaires focus on perceived safety and the characteristics of the Noorderplantsoen and Stadspark. The sample for quantitative data contains 100 questionnaires per park to get a reliable analysis of the results. Firstly, 9 pictures per park are selected containing characteristics based on the Nasar/Fisher model. The density, visual accessibility and the physical accessibility are combined into a low, medium and high perception. Figure 3 (Lis et al., 2019) shows the difference in variables for sample situations built by characteristic plant forms which influence the three characteristics. Based on this the sample pictures for Noorderplantsoen and Stadspark are selected, shown in Appendix 2.

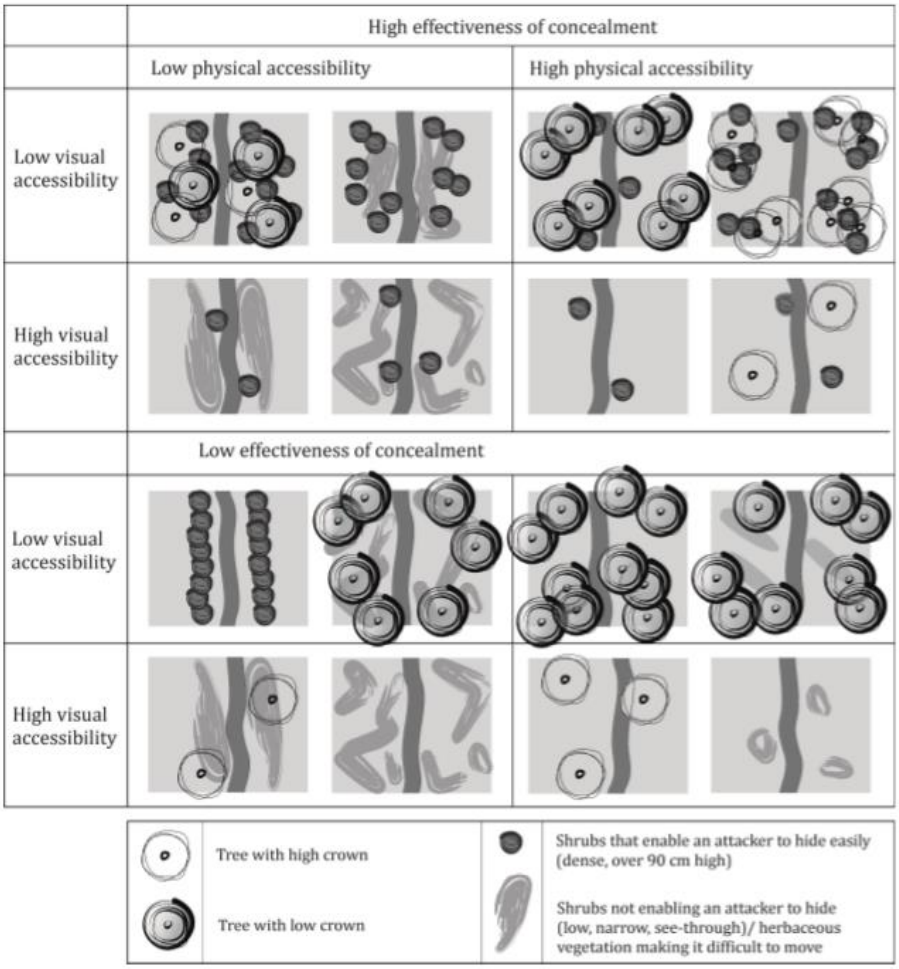

Figure 3. Examples of spatial situations for each subcategory (Lis et al., 2019).

Here, this first phase will lay the groundwork for the second phase about people's perceived safety of these pictures. The questionnaire is designed with Google Forms (Appendix 1). To avoid distraction or confusion when filling in the questionnaire the decision was made to split up the two parks in separate questionnaires containing the same structure and questions. Different respondent groups are used due to the intensity of one questionnaire. The sample per questionnaire contains 100 respondents. The questionnaires are spread separately through social media, such as Facebook groups. Using an online platform to gather data might have excluded people and thus influenced the age category. To get a clear overview and broad perspective a wide age category is selected for this research. The research group are people between 16 and 65 years old. The order of the pictures in each questionnaire was random. All ratings used a 5-point scale ranging from 1 (lowest possible rating) to 5 (highest possible rating). The corresponding question and answer scale of the variables used in the questionnaire are presented in Table 1 below, based on Lis et al. (2019).

Variable	*Question*	*Answer scale*
Safety, dependent	How safe would you feel in this environment?	1 'very unsafe' 5 'very safe'
Density, independent	Imagine that you hide behind the shrubs or trees that you can see. Do you think this would be a good hiding place?	1 'bad place' 5 'good place'
Visual accessibility, independent	When you would be in this place, would it be easy to see other people or for other people to see you?	1 'easy to see' 5 'hard to see'
Physical accessibility, independent	How easy do you think it is to get to the place in the photograph?	1 'easy' 5 'hard'

Table 1. Questionnaire variables explanation

3.3 Qualitative: In-depth Interview

The quantitative findings are supported by six in-depth interviews of men and women of several age groups. The interviews will broaden insights on perceived personal safety in city parks and what characteristics participants focus on (Appendix 3). The participants do not need to be familiar with the Noorderplantsoen or Stadspark. This is done to exclude past experiences or images people have from these two specific parks and to focus on perceived personal safety and the characteristics itself. Analysing these results together with the statistical results, about the parks in Groningen, it will be interesting to see whether the importance of the characteristics of city parks confirm each other. The questions highlight the decisions made before and the intention of visiting a park: activity, company and timing. Furthermore, the focus is on how an individual perceives the surroundings of a park and what is desired with regard to feel safe. Here the focus is on the surroundings, vegetation density/set up, as well as the dynamic in the park. Moreover, a sensitive part is highlighted in the interviews. This is about past experiences, this can be negative ones as well as positive ones. The focus is on how these experiences influence the present decisions of visiting a park.

The in-depth interviews were done by phone call, due to the COVID-19 restrictions. Due to these circumstances, participants were asked via other social connections, followed by a phone call interview. Forehand the interview, it was emphasized that the participant had the option to not answer a question or to withdrawal afterwards. The interview is transcribed and coded afterwards, this to make links between what participants mentioned about the characteristics (Appendix 3).

3.4 Research Ethics

Ethics are important in data storage and personal information (Clifford et al., 2016). The topic discussed can cover sensitive personal information. Therefore, it is important that the respondent is assured all answers are kept anonymous. The interviews are recorded, with approval of the participant, with a personal laptop and stored here. Moreover, to act ethically is important to build up trust with the interviewee. So, answers will be as fair as possible and participants do not perceive any negative feelings during or after participating. Social desirability bias might influence respondents given results (Callegaro, 2008). In this study this relates with the gender differences and the image of men (Bronlow, 2005). The gender differences are tested, here it is hard to include everyone, especially people that feel genderless or transgender. Therefore, the categories: 'men', 'women', 'don't want to say' and 'other' are created. Furthermore, the interviews will not take place in the park itself, due to feeling uncomfortable or disturbed. Also seen certain circumstances, limitations due to COVID-19, the interviews are done through virtual device. Participants perceived this way of interviewing as doable, but not as comfortable as face-to-face interviews. Phone interviews are not desirably in perspective of creating a trustworthy atmosphere. Moreover, fake names are used for results highlighted. This to give the participant the feeling that they are valued in the research and not a number.

3.5 Data analysis

The questionnaire is answered using Likert-scale. Therefore, the data is analysed as ordinal data. In order to answer the research question and to test the hypotheses, statistical analyses were carried out using IBM SPSS Statistics 25 software. First, the pictures are analysed individually. An analysis of basic descriptive statistics, the mode, is conducted to analyse which value is most chosen per picture. Together with a correlation analysis an indication of the relation between the variables is presented. Pearson Correlation and Spearman's Rho Correlation were used in order to test the relation and its strength between the independent variables and the dependent variable. The values of the correlation coefficient will be between 1 and -1, whether the value is negative or positive, the value of r is analysed as presented in Table 2, (Burt et al., 2009). When there is a negative correlation, the variables move inverse directions. Moreover, if there is a positive correlation, the variables move in the same direction. The 'X' sign is used to present the tested relation between two variables.

Value 'r'	*Interpretation strength relation*
.00-.30	(very) Weak
.30-.50	Moderate
.50-.70	Strong
.70-.90	Very strong
.90-1.0	Extremely strong

Table 2. Interpretation value r (Burt et al., 2009)

Furthermore, the pictures are analysed together in order to draw a conclusion of each park about the perceived personal safety. This is done using the low and high Likert-scale values of the pictures per variable. The variables are recoded using count values within cases to merge the values. In Table 3 the new created variables per park are presented. Now the new variables can be treated as interval data, therefore the Pearson Correlation is used to find relationships and their strengths.

Label new variable	*Likert scale value used*	*Original Variable*
Unsafe_park	Value 1&2	Safety (dependent variable)
Safe_park	Value 4&5	Safety (dependent variable)
DensityHigh_park	Value 4&5	Density (independent variable)
DensityLow_park	Value 1&2	Density (independent variable)
VISaccHard_park	Value 4&5	Visual accessibility (independent variable)
VISaccEasy_park	Value 1&2	Visual accessibility (independent variable)
PHYaccHard_park	Value 4&5	Physical accessibility (independent variable)
PHYaccEasy_park	Value 1&2	Physical accessibility (independent variable)

Table 3 – New created variables

A correlation test between the independent variables is done, to check whether these have a relation and, if so, how strong this relation is. To check for gender differences regarding perceived safety, the median for safety per picture is analysed. The coding scheme presented in Figure 4 is used to analyse the information gathered from the interviews.

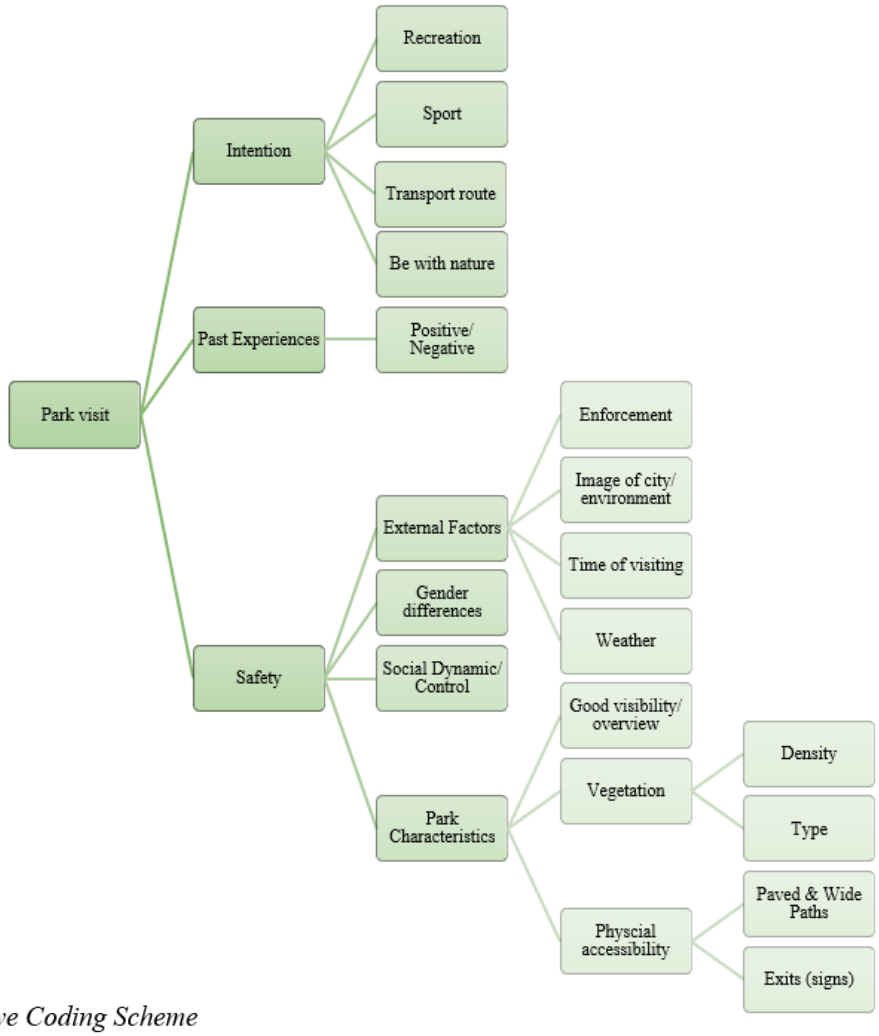

Figure 4. Deductive Coding Scheme

The deductive code tree is a good first analysis for possible interpretations of the interviews. The analysis of the data starts with open coding (LaRossa, 2005). The coding scheme links with the setup of the interview. The information collected is about the intention of visiting the park, past experiences and the perceived safety. The *intentions* and *past experiences* varied per participant and specific codes are designed after analysing the interviews. The codes among *safety* are based on the literature. *Park characteristics* contain the three elements of the Nasar/Fisher model. When mentioning *vegetation*, the *type* and *density* are highlighted. The *paths* and *exits* are linked with the prospect-refuge theory of Appleton (1975). Additional, Fisher and Nasar (1992) proposed that the possibility to escape also contributes to the perception of safety. Escape may require physical exit routes from potential threats, or proximity to other people who can help, this links to the *physical accessibility* and *social dynamic*. *Gender differences* is created to analyse the input of participants. Women are often afraid of walking outdoors alone after dark (Farral et al., 2000; Bronlow, 2005), which links to the *time of visiting*. Analysing the interviews, some codes are added afterwards due to participants mentioning these elements as influential factors, such as the codes among *external factors*.

4. Results

4.1 Quantitative

4.1.1 Descriptive Statistics

Per park, the population consisted of 100 participants. For Noorderplantsoen 70.0% consists of women, 29.0% is men and 1.0% prefers not to say. The age range is from 16 to 60 years old with the mean of 27.60. For Stadspark 71.0% consists of women and 29.0% of men. The age range is from 16 and 62 years old with the mean of 27.51. Although the parks have different samples, the descriptive statistics of the participants correspond with each other. The average age is lower because the questionnaire is spread among students and through online platform with age categories between 20 and 30 years old. The average age is influenced by the sampling strategy.

4.1.2 Analyses Quantitative Data

In Figure 5 and 6 below, the modes per picture and category of both parks are presented. This to get an impression of what values are most chosen per question (Burt et al., 2009). Thus, to get an indication of which characteristic has which value as the most chosen one. Figure 5 and 6 present the pictures which are divided in the category ‘safety’. Varying from ‘very safe’, value 5 at the top, to ‘very unsafe’, value 1 at the bottom of the figure.

Noorderplantsoen

Very Safe

Picture 8:

Safety 5
Density 1
Visual acc. 1
Physical acc. 1

Picture 9:

Safety 5
Density 1
Visual acc. 1
Physical acc. 1

Picture 1:

Safety 4
Density 3
Visual acc. 3
Physical acc. 2

Picture 2:

Safety 4
Density 4
Visual acc. 3
Physical acc. 2

Picture 4:

Safety 4
Density 1
Visual acc. 1
Physical acc. 2

Picture 5:

Safety 4
Density 2
Visual acc. 2
Physical acc. 1

Picture 7:

Safety 4
Density 2
Visual acc. 2
Physical acc. 2

Picture 3:

Safety 2
Density 4
Visual acc. 4
Physical acc. 3

Picture 6:

Safety 2
Density 4
Visual acc. 4
Physical acc. 3

Very Unsafe

Figure 5. Mode per variable Noorderplantsoen

Figure 6. Mode per variable Stadspark

When analysing both parks, the safe pictures, with the most chosen value 5, the density, visual accessibility and physical accessibility are all very low, value 1 is most chosen. Thus, the safe pictures are analysed as being a bad hiding place, it is easy to see other people or for other people to see you. Furthermore, it is easy to get to the place of the picture. When looking at the unsafe pictures, the most chosen value is 2, the density and visual accessibility are relatively high, value 4 and 5 are most chosen. Thus, the unsafe pictures are analysed as being good hiding places, it is hard to see other people or for other people to see you. Furthermore, the physical accessibility has value 3 as the most chosen value, which is established as the middle or neutral value.

4.1.3. Correlation Pictures

To test the relation and its strength between the variables per picture, the correlation test Spearman's Rho is used. Interpretation of 'r' is presented in Table 2, found in section *'3.5 Data analysis',* page 8.

N = 100	**Picture**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Safety_X_Density	Correlation Coefficient	0.022	-0.315**	- 0.247*	-0.243*	-0.441**	-0.218*	-0.347**	-0.563**	-0.202*
	Sig. (2-tailed)	0.827	0.001	0.013	0.015	0.000	0.029	0.000	0.000	0.044
Safety_X_Visual Accessibility	Correlation Coefficient	-0.221*	- 0.251*	- 0.336**	-0.202*	-0.473**	*-0.142*	-0.321**	-0.357**	-0.313**
	Sig. (2-tailed)	0.027	0.012	0.001	0.044	0.000	*0.158*	0.001	0.000	0.002
Safety_X_Physical Accessibility	Correlation Coefficient	-0.205*	- 0.334**	-0.242*	-0.308**	-0.337**	*-0.031*	-0.395**	-0.343**	-0.338**
	Sig. (2-tailed)	0.041	0.001	0.015	0.002	0.001	*0.760*	0.000	0.00	0.001

** Correlation is significant at the 0.01 level (2-tailed)
* Correlation is significant at the 0.05 level (2-tailed)

Table 4 – Spearman's Rho Correlation Noorderplantsoen

Table 4 above shows the correlation coefficients of Noorderplantsoen, the pictures are similar to the ones in Appendix 2 and Figure 5. For Noorderplantsoen the tests between 'Safety_X_Density', 'Safety_X_VisualAccessibility' and 'Safety_X_PhysicalAccessibility', are for 8 out of 9 pictures significant at the 0.01 or 0.05 level. Correlation coefficients vary from -0.202 to -0.473 for the three tests thus, have a negative weak or negative moderate relationship. Only one strong relationship is found for 'Safety_X_Density' for picture 8, with a correlation coefficient of -0.563. The insignificant results are for picture 1 for Safety_X_Density, picture 6 for 'Safety_X_VisualAccessibility' and 'Safety_X_PhysicalAccessibility, thus no linear relationship is found here.

N = 100	**Picture**	**1**	**2**	**3**	**4**	**5**	**6**	7	**8**	**9**
Safety_X_Density	Correlation Coefficient	-0.233*	-0.225*	-0.406**	0.295*	0.387**	*-0.190*	-0.297**	-0.326**	*-0.088*
	Sig. (2-tailed)	0.020	0.025	0.000	0.003	0.000	*0.058*	0.003	0.001	*0.382*
Safety_X_Visual Accessibility	Correlation Coefficient	-0.208*	*-0.184*	-0.276**	-0.337**	-0.592**	-0.236*	-0.278**	-0.274**	-0.264**
	Sig. (2-tailed)	0.038	*0.067*	0.005	0.001	0.000	0.018	0.005	0.006	0.008
Safety_X_Physical Accessibility	Correlation Coefficient	-0.209*	*-0.164*	0.313**	*-0.161*	-0.279**	*-0.135*	-0.300**	-0.256*	*-0.171*
	Sig. (2-tailed)	0.037	*0.102*	0.002	*0.110*	0.005	*0.182*	0.002	0.010	*0.088*

** Correlation is significant at the 0.01 level (2-tailed)
* Correlation is significant at the 0.05 level (2-tailed)

Table 5 – Spearman's Rho Correlation Stadspark

Table 5 above shows the correlation coefficients of Stadspark, the pictures are similar to Appendix 2 and Figure 6. Also for Stadspark it is noticeably that all tests between 'Safety_X_Density', 'Safety_X_VisualAccessibility' and 'Safety_X_PhysicalAccessibility', if significant, have a negative weak or negative moderate relationship. Significance is at the 0.01 or 0.05 level, the correlation coefficients vary from -0.208 to -0.406. Only one negative strong relationship is found for 'Safety_X_VisualAccessibility' for picture 5 of -0.592. More insignificant results are found, for 'Safety_X_Density' picture 6 and 9, conspicuous to see is that these are also not significant for 'Safety_X_PhysicalAccessibility'. Furthermore, picture 2 is not significant for 'Safety_X_PhysicalAccessibility' and for 'Safety_X_VisualAccessibility'. Mostly, the amount of significance per tested category varies a little, although all have a negative weak to negative moderate relationship.

Both parks indicate to have negative correlations, this means that the variables move inverse. If the safety goes up, the density goes down, the visual accessibility and physical accessibility become easier. This also works the other way, if one of the independent variables increases, the dependent variable safety decreases. Confirmed by Jorgensen (2007) and Lis et al. (2019), stating that people feel less safe in parks with dense vegetation. Due to dense understory that restricts views thus, have lower visual accessibility and offer concealment. Furthermore, paths that can facilitate for movement and possibility to escape, thus easy physical accessibility, contribute to the perceived personal safety (Lis et al., 2019).

4.1.4 Correlation New Variables

The focus in this section is on the relation between variables of the pictures together. The new created variables, Table 3 section *'3.5 Data Analysis',* are used. The Pearson Correlation is used to find relationships and their strengths between the dependent variable and independent variables. Interpretation of 'r' is presented in Table 2, found in section *'3.5 Data analysis'*, page 8.

Variable Noorderplantsoen		Safe	Unsafe
DensityLow	Pearson Correlation	0.220*	*0.008*
	Sig. (2-tailed)	0.028	*0.934*
VISaccEasy	Pearson Correlation	0.373**	-0.202*
	Sig. (2-tailed)	0.000	0.043
PHYaccEasy	Pearson Correlation	0.398**	*-0.190*
	Sig. (2-tailed)	0.000	*0.058*
DensityHigh	Pearson Correlation	*-0.20*	*0.153*
	Sig. (2-tailed)	*0.845*	*0.127*
VISaccHard	Pearson Correlation	*-0.150*	0.285**
	Sig. (2-tailed)	*0.137*	0.004
PHYaccHard	Pearson Correlation	*-0.161*	*0.151*
	Sig. (2-tailed)	*0.110*	*0.133*
Variable Stadspark		Safe	Unsafe
DensityLow	Pearson Correlation	0.252*	*-0.167*
	Sig. (2-tailed)	0.028	*0.097*
VISaccEasy	Pearson Correlation	0.411**	*-0.344*
	Sig. (2-tailed)	0.000	*0.000*
PHYaccEasy	Pearson Correlation	0.411**	-0.344**
	Sig. (2-tailed)	0.000	0.000
DensityHigh	Pearson Correlation	*0.031*	*0.193*
	Sig. (2-tailed)	*0.762*	*0.055*
VISaccHard	Pearson Correlation	*-0.156*	0.300**
	Sig. (2-tailed)	*0.120*	0.002
PHYaccHard	Pearson Correlation	*-0.156*	0.300**
	Sig. (2-tailed)	*0.120*	0.002

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

** Correlation is significant at the 0.01 level (2-tailed)

Table 6. Significant Correlation new variables Noorderplantsoen and Stadspark

First, the relations for 'Safe' are analysed. Noticeably, is the relation between feeling safe and a low density, an easy visual accessibility and an easy physical accessibility are for both parks significant at a 0.05, 0.01 respectively level. According to the correlations, 0.220 and 0.252, respectively positive weak linear relationships are observed for both parks for 'Safety_X_Density'. The correlation coefficient for 'Safe_X_VISaccEasy' is for Noorderplantsoen 0.373 and for Stadspark 0.411, both have a positive moderate relationship. The correlation coefficient for 'Safe_X_PHYaccEasy' is for Noorderplantsoen 0.398 and for Stadspark 0.411, both have a positive moderate relationship. Positive moderate or positive weak relations are analysed, so the variables move in the same direction. Thus, if 'Safety' increases, the density becomes lower, the visual accessibility and physical accessibility become easier. Interesting to see and in line with the significant results above (Table 6) and literature, is that feeling safe, high density, hard visual accessibility and hard physical accessibility have no significant results.

Although, when looking at 'Unsafe', for Noorderplantsoen there are two significant results found. 'Unsafe_X_VISaccEasy' is significant at the 0.05 level, with a negative weak correlation coefficient of -0.202, the variables move inverse. In line with 'Unsafe_X_VISaccHard', with a positive weak relationship of 0.285. If 'Unsafe' increases, then in the negative relation the 'VISaccEasy' decreases, thus becomes harder. Therefore, confirmed with the positive relation, stating that 'VISaccHard' increases, visual accessibility becomes harder. Analysing Stadspark, three significant relations at the 0.01 level are found. For 'Unsafe_X_PHYaccEasy' the correlation coefficient is -0.344, a negative moderate relationship is analysed. Moreover, a significant relation for 'Unsafe_X_PHYaccHard' indicates a positive moderate relationship with 0.300. If 'Unsafe' increases, then the 'PHYaccEasy'

decreases in the negative relation and in the positive relation 'PHYaccHard' increases. Thus, confirmed by both, physical accessibility becomes harder. 'Unsafe_X_VISaccHard' has a correlation coefficient of 0.300, which indicates a positive moderate relationship. If 'Unsafe' increases, then 'VISaccHard' increases, the visual accessibility becomes harder. There are no other significant relations found for 'Unsafe'.

The results in Table 6 present for 'Safe', if significant, positive correlations. Indicating, if the safe feeling increases, then 'DensityLow' also increases. Thus, when people feel more safe, the density tends to be lower. Similar for VISaccEasy and PHYaccEasy, both increase when 'Safe' increases, the visual and physical accessibility become easier. Therefore, there are significant positive correlations between 'Safe' and 'DensityLow', 'VISaccEasy' and 'PHYaccEasy'. These results are in line with the previous results of the original variables, presented in Table 4 and 5. These results have a negative correlation between the variables. Stating, if 'Safety' increases, then 'Density' decreases which is the same as 'Safe' increases, then 'DensityLow' increases too. So, the correlations of the original variables were negative and of the new variables positive. Although, what these correlations indicate, the analyses, are in line and thus are confirmed by each other. The original variables as well as the new variables, confirm the literature and expectations of this study. Concluding, both results and literature confirm that people feel less safe in parks with dense vegetation and that restrict views (Jorgensen, 2007) and that physical accessibility contributes to the perceived safety (Lis et al., 2019).

4.1.5 Correlation Between Independent Variables

In this section the relations between the independent variables are tested. If so, how strong these relations are. According Lis et al. (2019) and Fisher and Nasar (1992) the density, level of concealment, contributes to the visual accessibility and physical accessibility. Therefore, a correlation test is done between the individual pictures. The original ordinal variables are used, thus the Spearman's Rho is used.

Noorderplantsoen N = 100	**Picture**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Density_X_Visual Accessibility	Correlation Coefficient Sig. (2-tailed)	0.416** 0.000	0.661** 0.000	0.737** 0.000	0.763** 0.000	0.652** 0.000	0.535** 0.000	0.654** 0.000	0.761** 0.000	0.702** 0.000
Density_X_Physical Accessibility	Correlation Coefficient Sig. (2-tailed)	*0.003* *0.980*	0.367** 0.000	*0.005* *0.962*	0.451** 0.000	0.239* 0.017	*0.044* *0.663*	0.406** 0.000	0.543** 0.000	0.539** 0.000
VisualAccessibility_X_ PhysicalAccessibility	Correlation Coefficient Sig. (2-tailed)	*0.193* *0.054*	0.345** 0.000	*0.070* *0.486*	0.426** 0.000	0.393** 0.000	*0.014* *0.894*	0.394** 0.000	0.523** 0.000	0.645** 0.000

* Correlation is significant at the 0.05 level (2-tailed)
** Correlation is significant at the 0.01 level (2-tailed)

Table 7. Correlation between independent variables per picture Noorderplantsoen

Interestingly, if significant, the relations are positive for Noorderplantsoen, Table 7. For 'Density_X_VisualAccessibility' all pictures are significant, thus have a linear relationship. The correlation coefficients vary from 0.416 to 0.763. Four pictures have a positive strong relationship, another four a positive very strong relationship and only one picture has a positive moderate relationship with 0.416 as correlation coefficient. Remarkably, for picture 1, 3 and 6, all three are not significant for 'Density_X_PhysicalAccessibility' and 'VisualAccessibility_X_PhysicalAccessibility'. For 'Density_X_PhysicalAccessibility' one positive weak, three positive moderate and two positive strong relations are found. For 'VisualAccessibility_X_PhysicalAccessibility' four positive moderate and two positive strong relations are found. Picture 8 and 9, tend to have the highest correlation coefficients for

the three categories. Concluding, the most significant and most strong or very strong relations are established for ‘Density_X_VisualAccessibility’.

Stadspark N = 100	**Picture**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Density_X_Visual Accessibility	Correlation Coefficient Sig. (2-tailed)	0.502** 0.000	0.483** 0.000	0.817** 0.000	0.586** 0.000	0.618** 0.000	0.715** 0.000	0.706** 0.000	0.809** 0.000	0.540** 0.000
Density_X_Physical Accessibility	Correlation Coefficient Sig. (2-tailed)	*0.114* *0.260*	0.279** 0.005	0.513** 0.000	0.246* 0.014	*0.148* *0.143*	*0.089* *0.377*	0.327** 0.001	0.304** 0.002	*-0.028* *0.783*
VisualAccessibility_X_ PhysicalAccessibility	Correlation Coefficient Sig. (2-tailed)	*0.041* *0.682*	0.249* 0.012	0.574** 0.000	0.338** 0.001	0.307** 0.002	0.218* 0.030	0.434** 0.000	0.393** 0.000	0.238* 0.017

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

** Correlation is significant at the 0.01 level (2-tailed)

Table 8. Correlation between independent variables per picture Stadspark

The results for Stadspark are presented in Table 8 above. For ‘Density_X_VisualAccessibility’ all pictures are significant, thus have a linear relationship. The correlation coefficients vary from 0.483 to 0.817. Only one picture has a positive moderate relationship, four have a positive strong relationship and four have a positive very strong relationship. Four pictures are insignificant for ‘Density_X_PhysicalAccessibility’, two have positive weak relations, two positive moderate and only one picture has a strong relation of 0.513. For ‘VisualAccessibility_X_PhysicalAccessibility’ only one picture is insignificant. Three relations are positive weak, four positive moderate and one positive strong relation are analysed. Interestingly, picture 3 indicates to have the strongest relations for the three categories. Correlation coefficients of 0.817, 0.513 and 0.574 respectively. Concluding, also for Stadspark ‘Density_X_VisualAccesibility’ has the most significant and strongest relations.

Interpreting the results, the conclusion is drawn that for ‘Density_X_VisualAccessibility’ all pictures have, for both parks, a significant relation. Furthermore, the correlation coefficients are positive strong and varying. Analysing both parks, only one picture has a positive moderate relation. Furthermore, four positive strong and four very strong relations are found. When looking at ‘Density_X_PhysicalAccessibility’ for both parks, five or six pictures are significant. The relationship, if significant, is for one or two positive weak and for two or three positive moderate and one or two positive strong relations are found. When analysing ‘VisualAccessibility_X_PhysicalAccessibility’, for Noorderplantsoen six are significant with correlation coefficients are between 0.345 and 0.645. For Stadspark more significant relations are established but with weaker correlation coefficients from 0.218 to 0.574. Concluding, ‘Density_X_VisualAccessibility’ has the strongest relation compared to the other categories. Interestingly, all the relations, if significant, have a positive correlation. Thus, the variables move in the same direction. Meaning, if the density increases, so does the visual accessibility and physical accessibility. If the visual accessibility increases, then physical accessibility increases too. This is confirmed by Lis et al. (2019) and Fisher and Nasar (1992), stating that the density, level of concealment, contributes to the visual accessibility and physical accessibility. Thus the results are in line with the literature.

4.1.6 Gender Differences

To indicate gender differences, the median is analysed for safety per picture. This is done for both parks to analyse the different chosen values for safety, results presented in Table 9 below.

Variable Safety	**Picture**	***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***9***
Noorderplantsoen	*Women*	4	3	2	4	4	2	4	5	4
	Men	4	4	3	5	4	2	5	5	5
	Women	3	3	5	4	3	2	4	4	3
Stadspark	*Men*	4	4	5	4	4	3	5	5	4

Table 9. Gender difference Safety per Park

For Noorderplantsoen, women chose five times a lower value for safety compared to men and four times the same value as men. For Stadspark women chose seven times a lower value for safety compared to men and only two times the same value as men. Concluding, from this table that women tend to feel less safe than man. These results are in line with the literature by Jorgensen (2002) about gender differences and safety. Since this is not the focus of this research, further research should be done on gender differences in order to draw clear conclusions on the influence of gender differences on the results presented in this study.

4.2 Qualitative

4.2.1 Participants

There are 6 in-depth interviews done and analysed to look at the perceived personal safety at a more detailed perspective. This is done through transcribing and coding the transcripts using the coding scheme presented in Figure 4, *'3.5 Data analyses'*, page 8. The aim is to analyse if the outcomes of the qualitative interviews are supported by the statistical outcomes from the questionnaires. Although, the questionnaires are about the Noorderplantsoen and Stadspark. The interviews are about perceived personal safety in general. The participants are presented in Table 10. Only one participant lives in Groningen and is familiar with both parks, the other participants are not familiar with the parks presented in this study.

Name Participant	*Gender*	*Age*
Tom	Male	20
George	Male	22
Jack	Male	29
Harry	Male	54
Romy	Female	23
Sophia	Female	46

Table 10. Information Participants Interviews

4.2.2 Interviews

Analysing the interviews, the following results are found. When focusing on the intention of visiting a park, the participants mentioned they visit to get some fresh air, go for a walk or run, meet friends or to be with nature. Besides, participants living next to a park use parks as transport routes. Tom, George, Jack and Harry mention, when focussing on their safety, they do not bother to visit a park alone. Contradictory, Romy and Sophia state they do not feel safe alone in a park and prefer to go with friends or Romy with her dog. This can be linked with the statement by Jorgensen et al. (2002), women describe themselves as less safe compared to men when passing parks.

According to participants the social dynamic is important for them regarding perceived safety. A good balance is highlighted between less people to experience peace in a park, their intention to go there,

and more people being active in order to feel safe. This balance is often mentioned and too much social dynamic or activity, such as cyclers, is experienced as disturbing by the participants. The idea of knowing that there are people around when help is needed, gives them a safe feeling. This is in line with Jorgensen and Anthopoulou (2007), stating that parks with little human intervention are perceived as less safe. When focussing on important contributors regarding city park characteristics and the perceived safety, all participants highlighted a good overview and visibility. It is interesting that all participants highlighted this and some participants emphasized this as their only important characteristic in order to feel safe. Furthermore, Romy, Tom, Sophia and Harry mentioned they pay attention to the paths and possible exits when they visit a park. So can signs that guide you to the exit, wider and paved paths contribute to perceived safety in a park. Confirmed by Fisher and Nasar (1992) and Lis et al. (2019), the possibility to escape using physical exit routes contribute to the perception of safety. Harry mentions, he scans on the roads all the time, his safety is largely based on the physical accessibility, where he can go but also where others come from, see Table 11. According to Hoffman et al. (2012), physical accessibility also describes the possibility of entering a site, not only escaping (Fisher & Nasar, 1992; Lis et al., 2019).

Code	*Participant*	*Quote*
Safety – Park characteristics – Physical accessibility	Harry (M, 54)	*"Several roads to go somewhere is important for me. I scan on where I can go, if there are side roads, where they go to and where they come from. For me my safety is based on the roads and its accessibility."*
Safety – Park Characteristics	Romy (F, 23).	*"If a park has a fence, so you cannot enter everywhere but that you have multiple exits. So if you enter somewhere that you can exit on the other side of the park so you can walk through it… diversity between walking paths and places to enter the woods and also grass fields so you have the visibility but also the different types of vegetation. Different kind of visibility levels combined with walking paths would be nice, that if you like to be more visible then the option is there."*
Safety – External Factors – Image environment	Tom (M, 19).	*"I live in Amsterdam so it is different, big city and I mean like the Bijlmer has a certain image so you are more alert. But if I am at my elderly house, it is a small village so I feel more safe because basically nothing really happens there so I'm not really aware or alert there."*

Table 10. Quotes Participants

Interesting is that Romy combined the independent variables; density, visual and physical accessibility herself when visualizing a safe park. She highlights the type of vegetation with walking paths and their visual accessibility, see Table 11. This links with the Nasar/Fisher model used in this study (Fisher & Nasar, 1992; Nasar & Fisher, 1993). Interestingly, all participants did not supported the idea of having enforcement as contributor to safety. According to the participants, this is a wrong intention and supports more negative feelings than feelings of safety. Instead a meeting place or office is preferred, where more people are around and where people could go for help. This links back to the above mentioned preferred social dynamic. All participants do not like or prefer to pass a park when it is dark or late in the evening. Although the two participants living next to a park, George and Tom, mention they do not bother since there is no other way then pass the park to get to their house. In this situation good lightening is important and contributes to their safety. Interestingly, only Tom and Romy mention the environment outside the park or a bad image, as an influential factor to their perceived safety, see Table 11 above. Koskela and Pain (2000) and Kullberg (2010) indicate a relation between the image of an area and the personal safety. Lis et al. (2019), confirm this relation with parks in areas that are considered as dangerous.

Overall, everyone links their park visits with positive experiences. The male participants mention that when they hear negative stories from others they still visit the place or are more alert when visiting. Contrary to the female participants, Romy tells that if she hears negative stories about a park she avoids

the park. Furthermore, Sophia mentioned she prefers to go with someone else or to more crowded places in the park because of past experiences. Here it is interesting to see the difference between men and women. Concluding that personal past negative experiences or friends' experiences might influence the visiting behaviour of the participants.

5. Discussion

As found in the literature and interviews, other external factors play a role in the perceived personal safety. Such as time of visiting, the social dynamic or image of an area. Often participants mentioned the social dynamic as the most important and influencing factor of their perceived safety when visiting a park. This research is not focussed on external factors but on the setup of the park itself with its vegetation and paths. Since it is mentioned as an important factor for all participants, future research should be done to draw conclusions. Furthermore, the gender differences highlighted in the literature section came forward in the statistical results and interviews. Accordingly, female participants tend to feel less safe compared to male participants. Female participants prefer not to go alone to a park or because of past experiences they prefer to stay in the more crowded places in the park or on the main roads. Moreover, in the statistical results women tend to select a lower value for safety compared to men. Although, this is not the main focus of this study and further research should be done to indicate a precise relations. Other limitations of this study are because of COVID-19. Virtual interviews were done, which could have influenced the trust needed to give fair answers. Moreover, the questionnaires spread through social platforms caused exclusion of several age groups, this might have influenced the average age of the samples.

6. Conclusion

Analysing the results, the characteristics density, visual accessibility and physical accessibility came forward as contributors to the perceived safety in city parks in Groningen. Interesting relations are found such as the negative, weak and moderate, correlations between the original variables per picture. Meaning, if the safety increases, then density, visual- and physical accessibility would decrease. Vice versa, if the dependent variable decreases, then independent variables would increase. This is confirmed with the results of the new created variables and their positive, weak and moderate, correlations. Meaning, if the safe variable increases, so would the variables; 'low density', 'easy visual accessibility' and 'easy physical accessibility'. The variables move in the same direction. Thus, according to the statistical results, in order to feel safe a low density, easy visual accessibility and easy physical accessibility are desired. This result is confirmed by Jorgensen (2007) and Lis et al. (2019), people feel less safe in parks with dense vegetation that restrict views, but physical accessibility contributes to the perceived safety. Moreover, the density is influenced by the visual accessibility, this relation is found to be positive strong or positive very strong. Analysing the interviews, density was often linked with visual accessibility. Interestingly, participants indicate to focus more on the visual accessibility and physical accessibility then on density regarding their safety. This is confirmed by a higher correlation coefficient for the first two variables. Participants highlighted social dynamic as most important factor and overview, good paved paths and exits as contributing factors to their perceived safety. Furthermore, the gender differences are tested. Resulting that women often chose a lower value of safety per picture compared to men. Confirmed by Jorgensen et al. (2002), women tend to have a lower perceived safety when in parks. To draw more precise conclusions on this gender difference, further research should be done. The influence of external factors, such as the social dynamic, image of an area and time of visiting all contribute to the perceived personal safety. Although these factors are confirmed by the interviews, further research should be done to draw clear conclusions about these relations.

7. References

Appleton, J. (1975). *The Experience of Landscape*. London: Wiley.

Appleton, J. (1984). Prospect and refuge re-visited. *Landscape Journal*, 3, 91–103.

Berman, M.G., Jonides, J. & Kaplan, S. (2008). The cognitive benefits of interacting with nature. *Psychological Science*, 19(12), 1207-1212.

Bjerke, T., Østdahl, T., Thrane, C., Strumse, E., (2006). Vegetation density of urban parks and perceived appropriateness for recreation. *Urban Forestry and Urban Greening*, 5 (1), 35–44.

Burt, J. E., Barber, G. M. & Rigby, D. L. (2009). *Elementary Statistics for Geographers*. 3rd edn. New York: Guilford Press.

Bronlow, A. (2005). A geography of men's fear. *Geoforum*, 36 (5), 581-592.

Callegaro, M. (2008). Social desirability. In P.J. Lavrakas (ed.), *Encyclopaedia of survey research methods*. (pp. 826). Thousand Oaks: Sage.

CBS (2020). *Regional key figures for the Netherlands*. Retrieved on July 2, 2020 from https://opendata.cbs.nl/statline/#/CBS/nl/dataset/70072ned/table?dl=255EB.

Coles, R.W. & Bussey, S.C. (2000). Urban forest landscapes in the UK – processing the social agenda. *Landscape and Urban Planning*, 52 (2–3), 181–188.

Esri (2020). Retrieved on July 2, 2020 from https://arcg.is/1jaCDD0.

Fisher, B. & Nasar, J.L. (1992). Fear of crime in relation to three exterior site features: Prospect, refuge, and escape. *Environment and Behaviour*, 24, 35–65.

Fischer, M.A. & Shrout, P.E. (2006). Children's liking of landscape paintings as a function of their perceptions of prospect, refuge, and hazard. *Environment and Behaviour*, 38, 373–393.

Fuller, R.A. Irvine, K.N., Devine-Wright, P., Warren, P.H. & Gaston, K.J. (2007). Psychological benefits of greenspace increase with biodiversity. *Biology Letters*, 3(4), 390-394.

Gozalo Rey G, Barrigon Morillas, J.M. & Montes Gonzalez, D. (2019). Perceptions and Use of Urban Green Spaces on the Basis of Size. *Urban Forestry & Urban Greening*, 46.

Gozalo Rey G, Barrigon Morillas, J.M., Montes Gonzalez, D. & Atanasio Moraga, P. (2018). Relationships among Satisfaction, Noise Perception, and Use of Urban Green Spaces. *Science of the Total Environment*, 624, 438–450.

GroningenLife, (2020). Gardens, parks and beaches. Retrieved on February 28, 2020 from https://www.groningenlife.nl/en/night-life/gardens-parks-and-beaches

Gundersen, V.S. & Frivold, L.G. (2008). Public preferences for forest structures: A review of quantitative surveys from Finland, Norway and Sweden. *Urban Forestry and Urban Green*, 7, 241–25.

Gustavsson, R. (2004). Exploring woodland design: designing with complexity and dynamics – woodland types, their dynamic architecture and establishment. In N. Dunnet & J. Hitchmough (Ed.), *The Dynamic Landscape* (pp. 184-214). London: Taylor and Francis Ltd.

Hagerhall, C.M. (2000). Clustering predictors of landscape preference in the traditional Swedish cultural landscape: Prospect refuge, mystery, age and management. *Journal Environmental Psychology*, 20, 83–90.

Hartig, T., Evans, G.W., Jamner, L.D., Davis, D.S. & Gärling, T. (2003). Tracking restoration in natural and urban field settings. *Journal of Environmental Psychology*, 23(2), 109-123.

Herzog, T.R. & Leverich, O.L. (2003). Searching for Legibility. *Environment and Behaviour*, 35, 459–477.

Herzog, T.R. & Bryce, A.G. (2007). Mystery and preference in within forest settings. *Environment and Behaviour*, 39 (6), 779–796.

Hoffman, M., Westermann, J.R., Kowalik, I. & van den Meer, E. (2012). Perceptions of parks and urban derelict land by landscape planners and residents. *Urban Forestry and Urban Green*, 11, 303–312.

Kuo, F.E., Bacaicoa, M. & Sullivan, W. (1998). Transforming inner-city landscapes: trees, sense of safety, and preference. *Environment and Behaviour*, 30(1), 28-59.

Kullberg, A. (2010). My home is my castle: residential well-being and perceived safety in different types of housing areas in Sweden, Ph.D. Thesis, Linköping University.

Lis, A., Pardela, L. & Iwankowski, P. (2019). Impact of Vegetation on Perceived Safety and Preference in City Parks. *Sustainability*, 11(22).

Jacobs, J. (1961). *The Life and Death of Great American Cities*. New York: Vintage Books.

Jansson, M., Fors, H., Lindgren & T., Wiström, B. (2013). Perceived Personal Safety in Relation to Urban Woodland Vegetation - a Review. *Urban Forestry & Urban Greening*, 12(2), 127–133.

Jorgensen, A., Hitchmough, J. & Calvert, T. (2002). Woodlands spaces and edges: their impact on perception of safety and preference. *Landscape and Urban Planning*, 60(3), 135-150.

Jorgensen, A. & Anthopoulou, A. (2007). Enjoyment and fear in urban woodlands - Does age make a difference? *Urban Forestry & Urban Greening*, 6, 267–278.

Jorgensen, A. (2004). The social and cultural context of ecological plantings. In N. Dunnett & J. Hitchmough (Eds.), *The Dynamic Landscape* (pp. 293-325). London: Taylor & Francis.

Koskela, H. & Pain, R. (2000). Revisiting fear and place: women's fear of attack and the built environment. *Geoforum*, 31 (2), 269–280.

Kothencz, G. & Blaschke, T. (2017). Urban Parks: Visitors' Perceptions Versus Spatial Indicators. *Land Use Policy*, 64, 233–244.

Madge, C., (1997). Public parks and the geography of fear. *Tijdschrift voor Economische Geografie*, 88, 237–250.

Nasar, J.L., Fisher, B. & Grannis, M. (1993). Proximate physical cues to fear of crime. *Landscape and Urban Planning*, 26, 161–178.

Onderzoek Informatie en Statistiek (OIS), (2019). Theme 13 public safety. Retrieved on July 2, 2020 from https://oisgroningen.nl/wp-content/uploads/2019/10/thema13-veiligheid.pdf.

Pain, R. (2001). Gender, race, age and fear in the city. *Urban studies*, 38(5-6), 899-913.

Sullivan, W.C., Kuo, F.E. & Depooter, S.F. (2004). The fruit of urban nature. *Environment and Behaviour*, 36(5), 678-700.

Spijker, S. N. & Parra, C., (2018). Knitting Green Spaces with the Threads of Social Innovation in Groningen and London. *Journal of environmental planning and management*, 61(5-6), 1011–1032.

Van Rijswijk, L., Rooks, G. & Haans, A. (2016). Safety in the eye of the beholder: Individual susceptibility to safety-related characteristics of nocturnal urban scenes. *Journal Environmental Psychology*, 45, 103-115.

Zhang, Y. and Berg & A. E. van den (2017). *How urban green spaces relate to health and well-being : the interplay between green space attachment, perceived quality and affordance*. Dissertation. University of Groningen.

8. Appendices

Appendix 1: Questionnaire

Questionnaires available through:
Questionnaire 1: https://forms.gle/xt2NJziqc7XrLesc7
Questionnaire 2: https://forms.gle/E6f5EfthJRaWYRCS8

1. What is you gender?
   - Male
   - Female
   - Other / None
   - Do not want to say

2. How old are you?
   …….

3. Look at this picture and answer the questions below regarding this picture.
   Example, all pictures used see Appendix 2.

3. How safe would you feel in this environment?
1: very unsafe – 2: unsafe – 3: neutral – 4: safe – 5: very safe

4. When giving this rate, where did you focus on or what influenced your answer? *Multiple answers can be chosen.* Because of: (vegetation = trees and shrubs etc.)
- the vegetation density
- how the area is set up: low, high and different types of vegetation
- the visibility
- the physical accessibility
- other:……..

5. Imagine that you hide behind the shrubs or trees that you can see. Do you think this would be a good hiding place?
1: very bad place – 2 – 3 – 4 – 5: very good place

6. When you would be in this place, would it be easy to see other people or for other people to see you?
1: Very easy to see – 2 – 3 – 4 – 5: very hard to see

7. How easy do you think it is to get to the place in the photograph?
1: very easy – 2 – 3 – 4 – 5: very hard to be seen

NEXT PICTURE

Appendix 2: Sample pictures Noorderplantsoen and Stadspark

Picture 1 	Picture 2 	Picture 3 
Picture 4 	Picture 5 	Picture 6 
Picture 7 	Picture 8 	Picture 9 

3.1 Sample pictures Noorderplantsoen

Picture 1 	Picture 2 	Picture 3 
Picture 4 	Picture 5 	Picture 6 
Picture 7 	Picture 8 	Picture 9 

3.2 Sample pictures Stadspark

Appendix 3: Interview template

Opening questions

1. What do you think of parks?
   Probes: do you like going there, how often do you go, what do you like especially.
2. With what kind of goal or intention do you make use of the parks?
   Probes: Free time, transport route, sporting, chilling with friends, other activity.
3. Do you go often alone to a park? Why (not)?
   Probes: Do you bother going alone? What is your preference?
4. What kind of experiences have you had when going to parks? Positive or negative ones?
   Probes:
   a. How did you feel?
   b. Did it influence your feeling when you go now to the park?
5. Do you take your safety into account when visiting parks?
   Probes: do you pay attention to time (day/night), how crowded it is, the weather, if you are alone.

Main questions – *These questions can be perceived as sensitive therefore, mention that it is okay if the participant does not want to share something.*

6. How do you perceive your safety in parks?
   Probes: do you feel safe, what influences that, when feeling unsafe, why? Due to: traffic, other people.
7. When you would analyse a place regarding its safety on what aspects would you pay attention?
   Probes: type/density vegetation, level of concealment, visual accessibility, physical accessibility, feeling you get when looking at surroundings.
8. What would you describe as a safe park?
   Probes: lightening, social security, activity, dynamics, set up of the park.
9. Did you ever had a negative experience in a park regarding safety?
   Probes: the feeling of being followed or being attacked, heard stories from other people with experiences.

Closing questions

10. Do you know any improvements could be taken to increase perceived safety?
    Probes: what can the government do, what can you or your friends do.
11. Is there something else I forgot to mention and you want to share?