Green Groningen

A case study on the effects of urban green on wellbeing

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1. Summary

Despite the fact that the presence of green spaces has proven to be an important element for both the environment (Alexander et al. 2019; Lee et al. 2015; Reis & Lopes, 2019; Wolf et al. 2020) and wellbeing (Bertram & Rehdanz, 2015; Bowler et al. 2010; Gascon et al. 2015; James et al. 2015), more and more green spaces are disappearing (Colding et al. 2020; Tzoulas et al. 2007). This research uses a combination of primary and secondary data to study the relationship between wellbeing and urban green in the city of Groningen, the Netherlands. By investigating the relationship between urban green and wellbeing in the city of Groningen, this study aims to promote the importance of green spaces in the urban environment.

The main research question 'how and to what extend does urban green affect the wellbeing of city dwellers?', together with several sub-questions, were answered in order to establish a relationship.

The primary data has been collected through an online survey, thus providing self-reported data on wellbeing by Groningen city dwellers.

The data shows that urban green has a positive effect on the wellbeing of Groningen city dwellers. The factors that make up wellbeing in this research are all positively affected by urban green, primarily mental health. However, various nuisances, such as litter, overcrowding and animal droppings, discourage the usage of green spaces and therefore have a negative effect on wellbeing. Parks, as a type of urban green, proved to have the most impact on wellbeing, as it allows for the most social interaction, physical activity and attention restoration.

This study has stressed the importance of including urban green in spatial planning in regards to the impact of urban green on city dwellers' wellbeing.

2. Introduction

2.1 Background

More than half of the world's population lives in urban areas and the urban space is continuously increasing (Alexander et al. 2019; Kondo et al. 2018). It has been proven that cities are the major emitters of greenhouse gasses and that they are the drivers of climate change (Depietri & McPhearson, 2016). Green spaces have the ability to reduce the effects of this climate change (Alexander et al. 2019; Lee et al. 2015; Reis & Lopes, 2019; Wolf et al. 2020), however, green spaces do not only have an impact on the environment, but they also affect human wellbeing (Bertram & Rehdanz, 2015; Bowler et al. 2010; Gascon et al. 2015; James et al. 2015). As the world is becoming increasingly urbanised, the preservation of urban green spaces is of the greatest importance (Hunter et al. 2019).

Kondo et al. (2018) state that very few studies focus on the link between explicitly urban green and wellbeing, rather than nature in any form.

Most case studies regarding the research of the relationship between urban green and wellbeing have been conducted in the US or Asia. Ma et al. (2019) analyses "the social, mental, and physical wellbeing of current Beijing residents" and studies how this wellbeing is impacted by the city's green spaces. This study showed that a higher degree of resident participation with green spaces led to improved wellbeing. Three studies by Song et al. (2014; 2015; 2013) research the effects of physical activities in urban parks in Japan. The findings showed that participants' heart rates were significantly lower when walking through an urban park than through a city area. It also showed that the feelings of anxiety and fatigue were lower in urban parks than on city streets. Wolch et al. (2014) compare green US and Chinese cities and found that the creation of green spaces can eventually lead to gentrification.

Many studies focus on a single type of urban green. Wolf et al. (2020) focus solely on urban trees, while Lee et al. (2015) and Song et al. (2013; 2014; 2015) focus solely on urban green in the form of urban parks and Wolch et al. (2014) also focus mainly on urban parks.

This study has researched the relationship between wellbeing and urban green in a European city, namely Groningen, a city in the most northern province of the Netherlands. The city's continuing population growth, partially due to foreign migration, and its increasing size (sociaalplanbureaugroningen, 2020) creates more pressure on the existing green spaces. This study also includes several types of urban green, rather than focusing solely on one specific type and it attempts to find which type of urban green has the most effect on wellbeing.

The municipality of Groningen aims to build 20.000 houses before 2030 (Stadszaken, 2019), thereby increasing the built-up (urban) area. By providing information on the importance of green spaces in urban areas, regarding human wellbeing, the importance of including urban green in spatial planning is emphasised.

2.2 Research Problem

This research aims to provide information on the relationship between urban green and the wellbeing of city dwellers, in turn explaining the importance of greenery in the urban space and stressing the importance of including urban green in spatial planning. In order to do this the following question has to be answered:

How and to what extent does urban green affect the wellbeing of city dwellers?

To answer this main question, the following sub-questions have to be answered:

- How is urban green defined in the field of spatial planning?
- How is wellbeing defined and measured in the field of spatial planning?
- What type of urban green has the most impact on wellbeing?
- What type of nuisances discourages city dwellers from partaking in activities in urban green spaces?

2.3 Structure

This study starts with a theoretical framework, in which the relevant theories and concepts are discussed. Followed by the methodology, where the research method is described. Both the secondary- and primary data are discussed; how they were collected and how they were analysed. The results of the data collection are discussed. By using the collected primary and secondary data conclusions were drawn and links to other literature were made. Afterwards, the main findings are summarised in the conclusions, accompanied by suggestions for further research. Finally, the references and appendices are listed.

3. Theoretical Framework

The environmental functions of urban green spaces have been researched extensively. Some key elements are the environmental benefits they provide: urban green spaces offset greenhouse gas emissions through CO_2 absorption, they counteract the urban heat island effect through reductions in surface and air temperatures at a local scale (Wolf et al. 2020) and they minimise air, water, and noise pollution (Lee et al. 2015). Urban greenery can also act as a measure for flood mitigation, by absorbing stormwater (Wolf et al. 2020). According to Lee et al. (2015), further ecological benefits include nature conservation and the preservation of biodiversity.

More recently, research into urban green spaces has expanded beyond the lines of environmental functions and has started exploring the potential health benefits of urban green spaces. There has been a growing awareness of the possible value of urban planning interventions in addressing public health issues (Lee et al. 2015). Several studies address the relationship between contact with green spaces and health benefits and show that this contact can have various positive impacts on health and wellbeing. General findings include physical benefits, stress reduction, attention restoration, increasing longevity and improved overall health (Bertram & Rehdanz, 2015).

3.1 Mental health

Urban green spaces have shown to improve mental health conditions (Gascon et al. 2015) and being exposed to urban green reduces anxiety, depression, anger, confusion and fatigue (Wolf et al. 2020). A study by Bowler et al. (2010) shows that negative emotions are self-reportedly lowered after exposure to a natural environment in comparison to a more man-made environment.

Kondo et al. (2018) show that exposure to green areas restores mental capacities, such as attention restoration and stress recovery. This study also states that urban green improves a person's mood and cognitive functions.

People who live in urban areas are found to be less healthy than those who live in more green areas. They also tend to have a higher risk of mental illnesses (De Vries et al. 2003).

3.2 Physical Health

Multiple studies by Song et al. (2013;2014;2015) in which one's heart rate was measured, found lower heart rates when subjects walked through an urban green environment compared to a built urban environment. Urban green has proven to positively affect the cardiovascular system (Kondo et al. 2018).

Engagement in physical activity may be influenced by that person's accessibility to and condition of their surrounding physical environment (Kondo et al. 2018). Green spaces in one's living environment can encourage people to spend more time outdoors and be more physically active (Tzoulas et al. 2007; De Vries et al. 2003). Bertram and Rehdanz (2015) state that proximity to parks may increase physical activity. According to Wolf et al. (2020), physical activity is associated with neighbourhood tree cover. It can increase active transportation modes and the rate of recreational walking.

Evidence has been found of a positive relationship between longevity and access to green spaces (Takano et al. 2002) and studies have shown that exposure to urban green leads to higher levels of activity and better-perceived health by users of those green spaces (Payne et al. 1998).

3.3 Social Interaction

Exposure to green space is also associated with improved social interaction, resulting in an overall improvement of mental health (Kondo et al. 2018).

Sadeghian & Vardanyan (2013) explain that urban parks are, as well as locations for recreation and leisure, important parts of urban community development. They facilitate social cohesion and social interaction. Residents' feelings of attachment to the environment and connections with other residents are influenced by natural features and open spaces (Kim & Kaplan, 2004)

Despite all of these benefits, urban green spaces may also negatively affect people's health and wellbeing, according to Bertram & Rehdanz (2015). The presence of certain animals may affect people's level of comfort and unilluminated green spaces are often perceived as unsafe at night time. Negative effects might also occur due to allergic reactions caused by pollinated plants.

3.4 Definitions

To study the effects of urban green on wellbeing, these two concepts must first be defined. The World Health Organisation (1948) defines health as "a state of complete physical, mental and social wellbeing." By combining this definition with the various factors that influence wellbeing according to other researchers, such as Bertram & Rehdanz (2015); Kondo et al. (2018); Gascon et al. (2015); Sadeghian & Vardanyan (2013), the concept of wellbeing is defined as followed:

The state of a person's mental health, physical health, and social interaction.

Colding et al. (2020) and Kabish & Haase (2013) define urban green as "any vegetation found in the urban environment, including parks, open spaces, residential gardens, or street trees". To define urban green in this study the various definitions from the literature have been combined, resulting in the following definition:

A green space in an urban setting.

The various types of urban green are based on the occurring types of green in the city being researched in the case study and the types of urban green that are discussed in the studied literature (Bertram & Rehdanz, 2015; Colding et al. 2020; Kabisch & Haase, 2013; Kabisch et al. 2016; Lee et al. 2015; Sadeghian & Vardanyan, 2013; Wolch er al. 2014; Wolf et al. 2020). The types of urban green that are included in this research are parks, forests, (near road) trees, (near road) grass, public gardens, and grasslands.

The relationship between urban green and wellbeing will be studied in Chapter 5. For a conceptual model of the relationship, including the factors that make up the two concepts, see Figure 1.

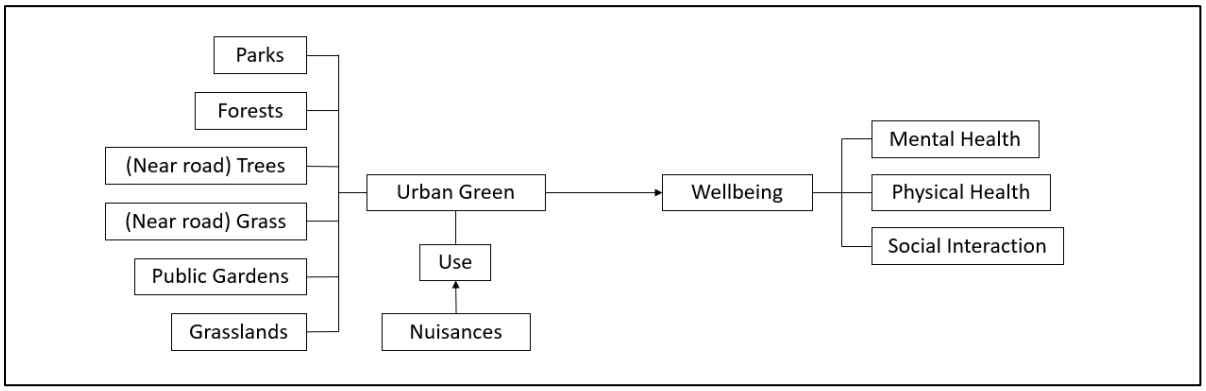

Figure 1: Conceptual model on the relationship between urban green and wellbeing

3.5 Hypotheses

Based on the studied literature this study hypothesises that there is a positive relationship between urban green and the wellbeing of city dwellers in Groningen, this is supported by Bertram & Rehdanz, 2015; Bowler et al. 2010; Gascon et al. 2015; Kondo et al. 2018; Lee et al. 2015; Wolf et al. 2020. However, there are also some negative effects on the wellbeing of city dwellers, caused by for example noise nuisance, the presence of certain animals or the feeling of unsafety, this is supported by Bertram & Rehdanz (2015).

This study hypothesises that Groningen city dwellers find that urban parks, out of the different types of urban green included in this study, have the most impact on their wellbeing. These spaces allow for social interaction, physical activities and other forms of recreation and relaxation that affect a person's wellbeing. This hypothesis is based on studies by Lee et al. 2015; Sadeghian & Vardanyan, 2013; Song et al. 2013; 2014; 2015; Wolch et al. 2014.

4. Methodology

This chapter discusses the various methods that were used while conducting this research on the relationship between urban green and wellbeing. The research consists of both a literature review and a case study, in which primary data was collected through a survey. The literature review provided secondary data on the different concepts and theories that were researched in the primary data collection.

4.1 Secondary Data

The secondary data was collected through a literature review. Here, the different concepts and theories that were researched in the primary data collection were explained. This literature review answered the first two sub-questions, which had to be answered in order to have a clear definition of each concept that was researched during the case study.

These concepts were used in the survey in order to investigate how and to what extent urban green affects the wellbeing of city dwellers. The literature review also provided information on previously conducted studies and allowed for expectations and hypotheses to be made. With the use of the survey during the primary data collection, these hypotheses and expectations can be proven or refuted.

The literature used for the literature review has been found with the use of several search engines, including Scopus, Google Scholar and ScienceDirect. The keywords used in order to find useful literature include 'urban green', 'green space', 'wellbeing', 'health', 'life satisfaction'. The references in the articles that followed from these search terms provided useful literature as well.

4.2 Primary Data

The primary data was collected through a case study with the use of an online survey. The case study took place in the city of Groningen, the Netherlands. As travelling was discouraged due to the ongoing pandemic the choice was made to conduct the case study in the city of Groningen, where I live. Personal contacts could then be used to distribute the survey online instead of relying on personal interviews, where the Covid-19 regulations would be difficult to uphold.

Collecting primary data was a deliberate choice, as there is no existing dataset available with the information needed for this research. By collecting primary data, the questions were made to be able to collect the data needed for this research.

4.2.1 Primary Data Collection

The survey was distributed on the 25th of March at 16.00 and the data collection was stopped on the 29th of April at 12.00.

The survey was distributed through social media and personal contacts. Each respondent was asked, but not required, to share the survey with others. The survey could be done in English and Dutch, thus reaching more Groningen city dwellers.

Before answering the survey the respondents were informed about the aim of the research and how their data would be used. The respondents' privacy is respected. The survey could be answered anonymously and the answers provided are confidential. The data will not be used by anyone other than the person conducting this research.

In the survey, the respondents were asked about their experiences with several types of urban green (as defined in section 3.4) in the city of Groningen. To make sure that the respondents were familiar

with the various types of urban green being studied, the survey provided the respondents with pictures of each type of urban green.

The survey started with three demographics questions, followed by a combination of Likert scale response format, rankings, multiple-choice/multiple answers and open-ended questions to find self-reported data on wellbeing and several types of urban green in the city of Groningen to see how urban green affects the wellbeing of Groningen city dwellers. For the full survey see Appendix 1.

The respondents provided self-reported data on the effects of urban green on their wellbeing. According to Short et al. (2009) "self-report is one of the most widely used methods of collecting information regarding individuals' health status".

4.2.2 Primary Data Analysis

The primary data collection in the survey was a combination of nominal and ordinal data. The open and multiple-choice/multiple answer questions provided nominal data. For each question, the most frequent response (the mode) was selected. The Likert scale responses to the statements provided ordinal data, however, calculations were made by treating the data as interval. This is elaborated upon in section 5.2. For each statement, the mode and mean (average) were calculated and the responses were visualised in a bar chart. The mean was calculated with the use of Sullivan & Artino (2013), this is elaborated upon in section 5.2 and Figure 10. The ranking questions also provided ordinal data. By adding up each rank for the different types of urban green a total ranking has been made for each question. This was done through a rank-point system. If, for example, a respondent put 'parks' on number 1 for the question 'which type of urban green allows for the most physical activity?', parks then received 1 point. If a respondent put 'parks' on number 2, 'parks' then received 2 points, and so on. This means that the higher the type of urban green was ranked, the lower the total points.

The main research question 'how and to what extent does urban green affect the wellbeing of city dwellers?' was answered through a quantitative and qualitative analysis of the primary data. The third sub-question 'what type of urban green has the most impact on wellbeing?' was answered through the ranking and multiple-choice/multiple answer questions analysis. The fourth and final sub-question 'what type of nuisances discourage city dwellers from partaking in activities in urban green spaces?' was answered through the analysis of the multiple answers and open-ended questions. Figures 2, 3 and 4 give an overview of which questions were answered by which method.

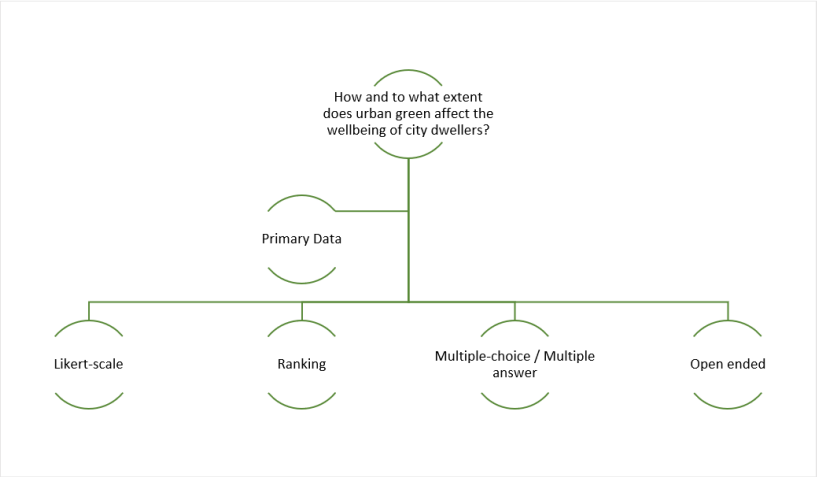

Figure 2: How is the research question answered?

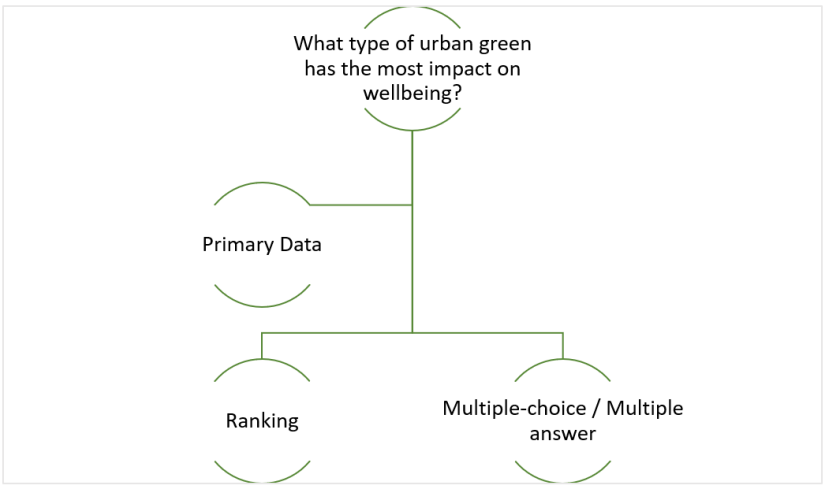

Figure 3: How is sub-question 3 answered?

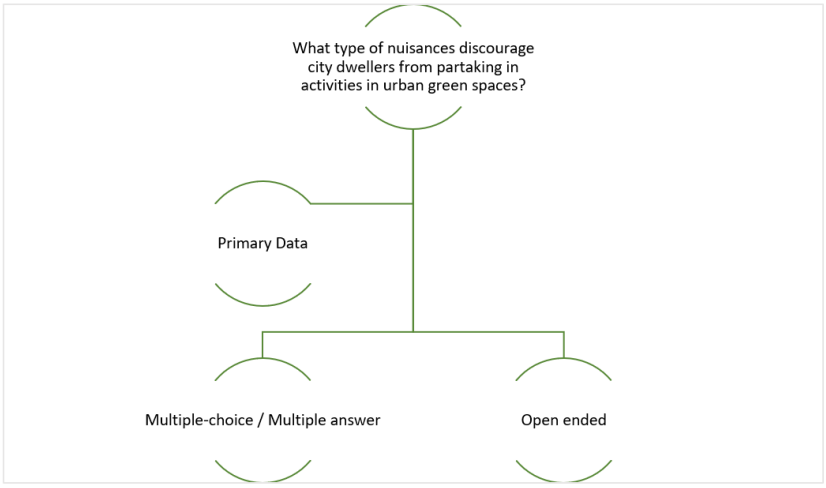

Figure 4: How is sub-question 4 answered?

5. Results

This chapter discusses the data results from the primary data collection. Chapter 3 discusses the secondary data that answers the first two sub-questions that are linked to the primary data in Chapter 5 and 6. The main research question, together with sub-questions three and four are answered here.

5.1 Demographics

The survey resulted in a total of 105 respondents. The survey could be taken in either English or Dutch. 102 respondents did the Dutch version of the survey and 3 did the English version. 10 of the respondents did not live in the city of Groningen. Their survey was therefore terminated after answering 'no' to the question 'do you live in the city of Groningen?'.

The 95 remaining respondents resulted in the following demographics:

- The respondent's age can be seen in Figure 5. This shows that the largest age group of respondents is 18 – 24, followed by 45 -54. No people of 85 or older took the survey.
- How the respondents identify can be seen in Figure 6. The figure shows that the respondents were mainly female (55%). No respondent preferred not to say how they identify.

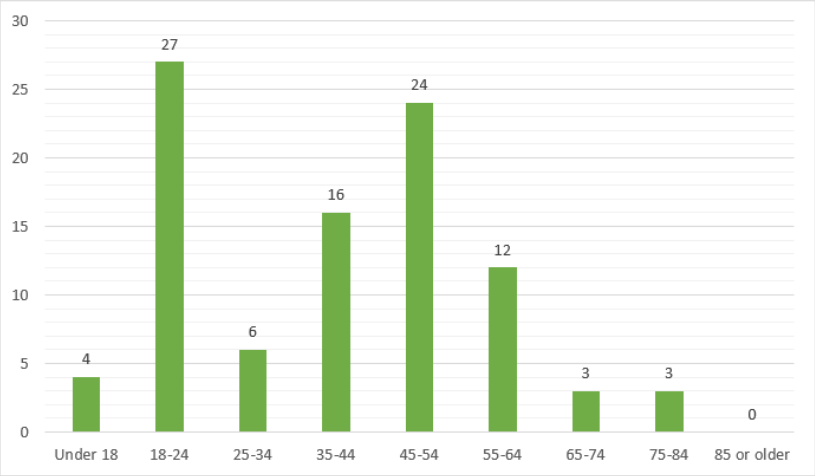

Figure 5: Respondent's age

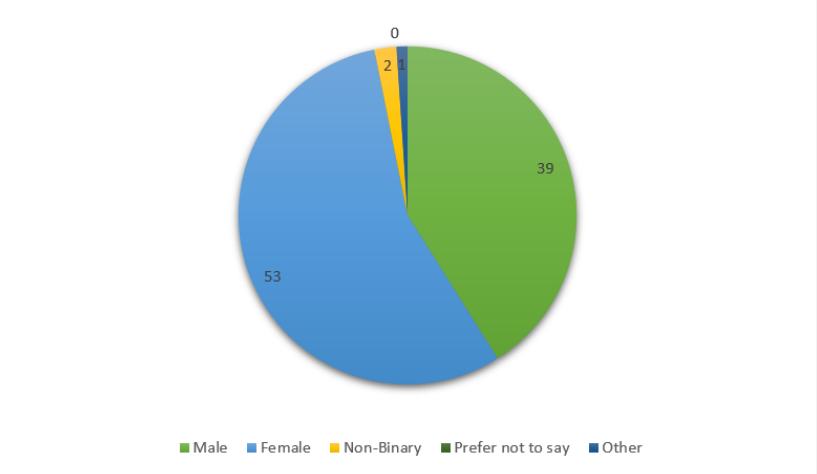

Figure 6: Respondent's identification

5.2 Likert scale

The survey continued with a section of Likert scale statements. Here, the respondents were given three statements on the three different factors of wellbeing; social interaction, physical health, and mental health. Figure 7, 8 and 9 show the responses to these statements. Each bar indicates the number of respondents that put each statement on that level of the Likert scale.

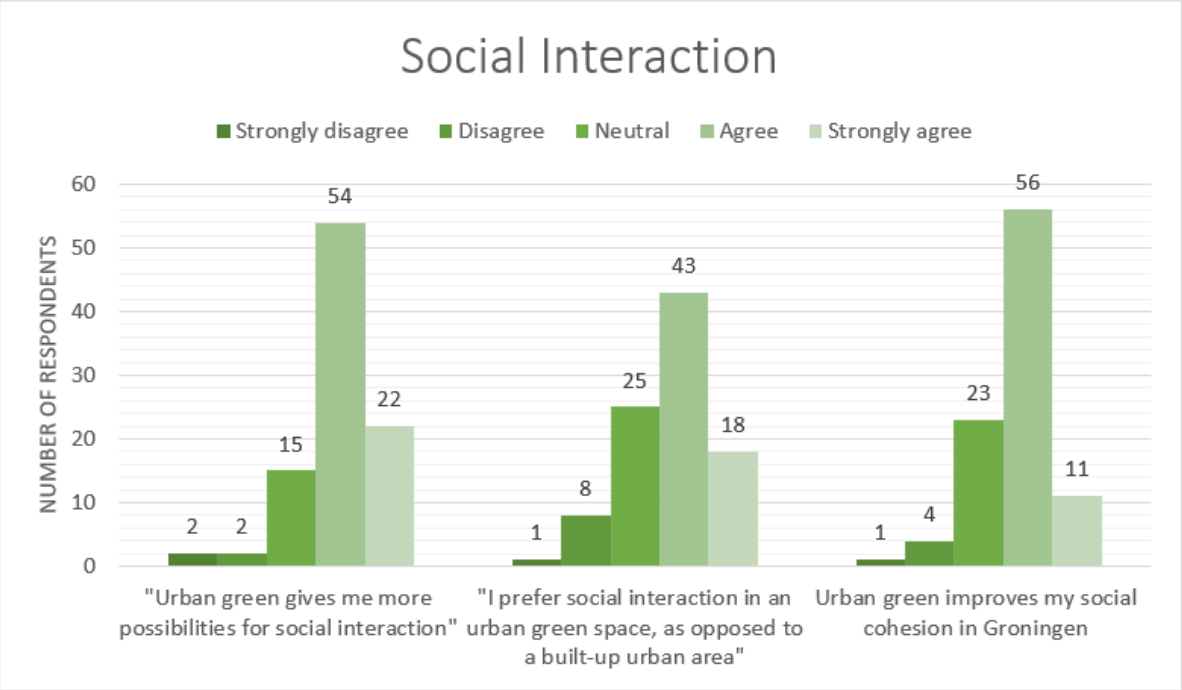

Figure 7: Likert scale responses to the statements regarding social interaction

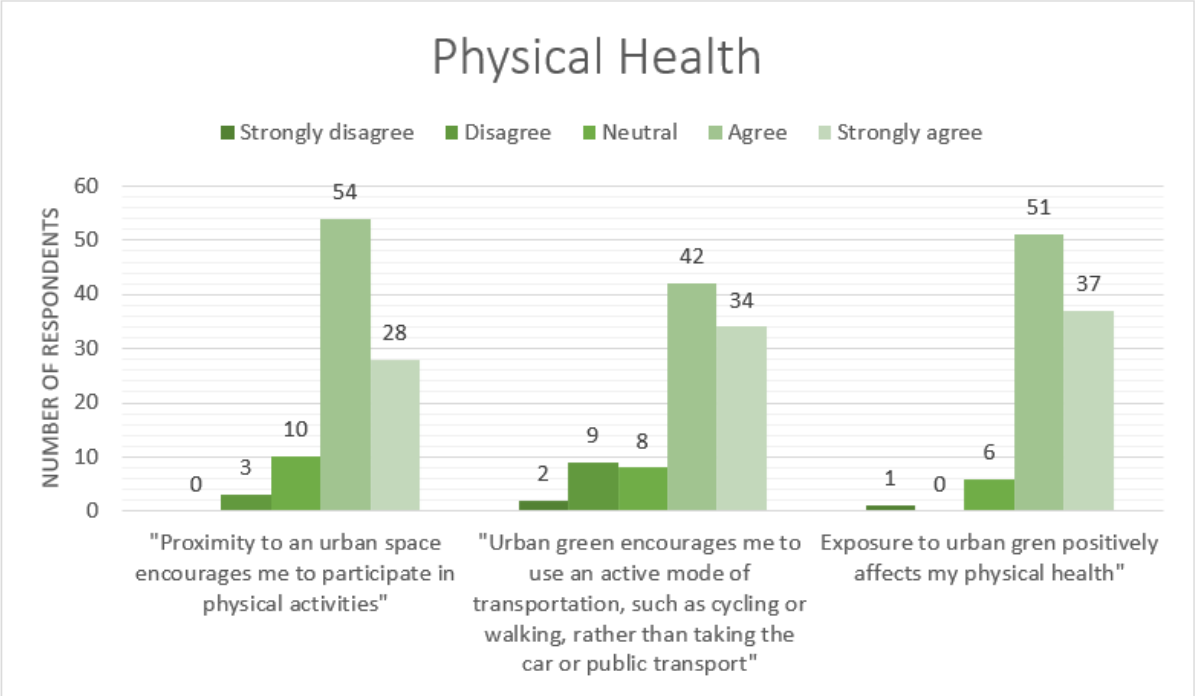

Figure 8: Likert scale responses to the statements regarding physical health

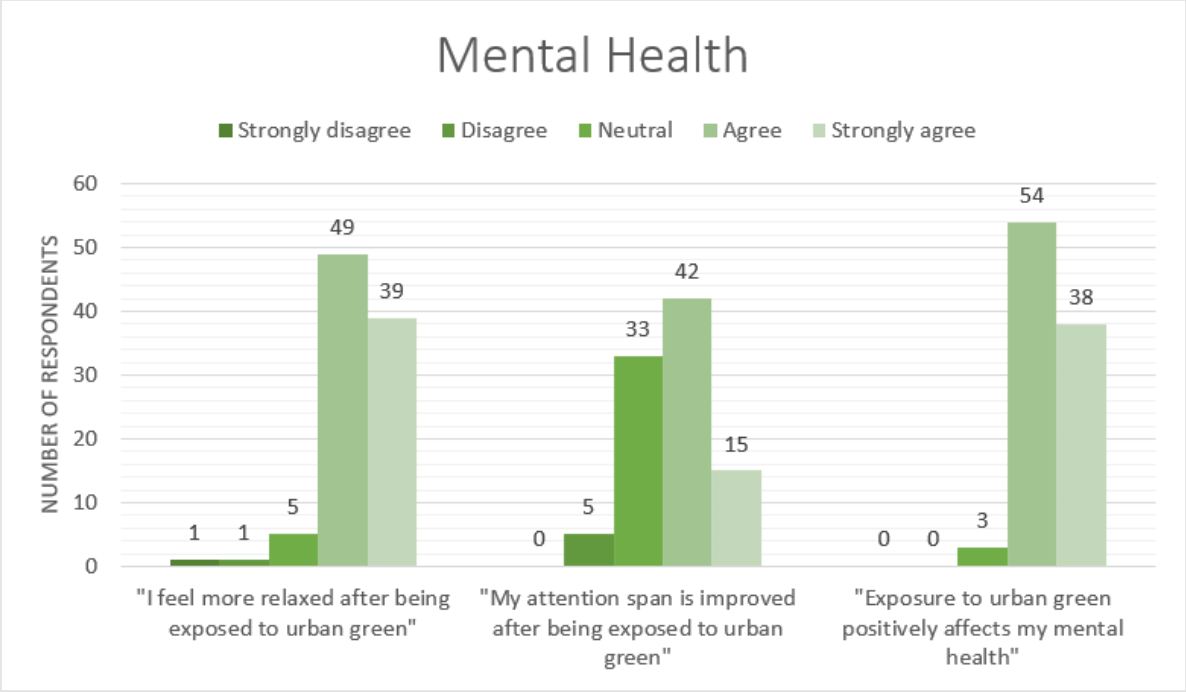

Figure 9: Likert scale responses to the statements regarding mental health

There is a long-standing debate on whether or not the Likert scale data can be considered as interval data. A Likert scale is generally considered an ordinal scale measure. The categories on this scale have a rank order, but the intervals between these categories cannot be presumed equal (Jamieson, 2004). However, a five-point Likert scale with categories 'strongly disagree', 'disagree', 'neutral', 'agree' and 'strongly agree', which was used in this study, conventionally gets assigned values from 1 to 5, which then can be treated as numerical numbers (Leung & Wu, 2017). According to (Norman, 2010) it is irrelevant whether or not we can theoretically guarantee that the true distance between 1 (strongly disagree) and 2 (disagree) is the same as 3 (neutral) and 4 (agree) as "the computer has no way of affirming or denying it". All the computer can do is draw conclusions based on the numbers themselves and so we can make inferences about their means (Norman, 2010).

With the aid of SPSS, the mode and mean were calculated for each statement. The mean was calculated with the aid of the Sullivan & Artino (2013) Likert scale grading, see Figure 10.

Strongly disagree	1 – 1.80
Disagree	1.81 – 2.60
Neutral	2.61 – 3.40
Agree	3.41 – 4.20
Strongly agree	4.21 – 5.00

Figure 10: Calculation of the mean on a Likert scale (Sullivan & Artino, 2013)

This gave the following results:

Social Interaction statements:

1. Urban green gives me more possibilities for social interaction.
    - Mode: agree
    - Mean: agree (3,97)

2. I prefer social interaction in an urban green space, as opposed to a built-up urban area.
    - Mode: agree
    - Mean: agree (3,73)
3. Urban green improves my social cohesion in Groningen.
    - Mode: agree
    - Mean: agree (3,76)

Physical Health statements:

1. Proximity to an urban green space encourages me to participate in physical activities.
    - Mode: agree
    - Mean: agree (4,13)
2. Urban green encourages me to use an active mode of transportation such as cycling or walking, rather than taking the car or public transport.
    - Mode: agree
    - Mean: agree (4,02)
3. Exposure to urban green positively affects my physical health.
    - Mode: agree
    - Mean: strongly agree (4,29)

Mental Health statements:

1. I feel more relaxed after being exposed to urban green
    - Mode: agree
    - Mean: strongly agree (4,31)
2. My attention span is improved after being exposed to urban green.
    - Mode: agree
    - Mean: agree (3,71)
3. Exposure to urban green positively affects my mental health.
    - Mode: agree
    - Mean: strongly agree (4,37)

The SPSS frequency tables and descriptive statistics from which these modes and means were derived can be seen in Appendix 3.

These results show that respondents prefer social interaction in urban green spaces and that urban green allows for more social interaction. The respondents find that urban green positively affects their physical health and encourages physical activities. Urban green also positively affects the respondents' mental health, it improves their attention span and allows them to feel more relaxed.

5.3 Ranking

The next section of the survey consisted of four questions in which the respondent was asked to rank the types of urban green. For each question the ranks for the different types of urban green have been added up, resulting in a final ranking for each individual question. This is explained in more detail in Chapter 4. The tables below show the responses. Each column shows how many respondents put that specific type of urban green on that rank. The final ranking is then shown, accompanied by the number of points it received from the respondents ranking. The lower the number, the higher the ranking.

- Which type of urban green allows for the most physical activity?

	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6
Parks	53	31	6	4	1	0
Forests	38	40	11	4	1	1
(near road) trees	0	4	12	24	34	21
(near road) grass	2	7	13	9	33	31
Public gardens	2	5	32	23	11	22
Grasslands	0	8	21	31	15	20

Table 1: Respondent's ranking to the question 'Which type of urban green allows for the most physical activity? '

The following rank can then be derived from the total scores in table 1:

1. Parks (154)
2. Forests (178)
3. Public gardens (387)
4. Grasslands (398)
5. (near road) Trees (436)
6. (near road) Grass (442)

- Which type of urban green allows for the most social interaction?
  - This question showed 2 missing responses.

	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6
Parks	78	15	0	0	0	0
Forests	9	37	34	10	3	0
(near road) trees	0	1	9	20	34	29
(near road) grass	0	3	3	17	39	31
Public gardens	6	31	36	9	6	5
Grasslands	0	6	11	37	11	28

Table 2: Respondent's ranking to the question 'Which type of urban green allows for the most social interaction? '

The following rank can then be derived from the total scores in table 2:

1. Parks (108)
2. Forests (240)
3. Public gardens (272)
4. Grasslands (416)
5. (near road) Trees (453)
6. (near road) Grass (464)

- Which type of urban green restores your attention the most?
  - This question showed 4 missing responses

	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6
Parks	41	31	17	2	0	0
Forests	45	32	5	4	5	0
(near road) trees	0	5	12	18	42	14
(near road) grass	0	2	6	12	31	40
Public gardens	1	10	40	20	9	11
Grasslands	4	11	11	35	4	26

Table 3: Respondent's raking to the question 'Which type of urban green restores your attention the most?'

The following rank can then be derived from the total scores in table 3:

1. Parks (162)
2. Forests (165)
3. Public gardens (332)
4. Grasslands (365)
5. (near road) Trees (412)
6. (near road) Grass (465)

- Which type of urban green allows for the most stress release?
  - This question showed 3 missing responses

	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6
Parks	38	35	14	4	1	0
Forests	49	32	8	2	1	0
(near road) trees	0	3	12	19	39	19
(near road) grass	0	1	6	17	28	40
Public gardens	1	11	39	16	12	13
Grasslands	4	10	13	34	11	20

Table 4: Respondent's ranking to the question 'Which type of urban green allows for the most stress release? '

The following rank can then be derived from the total scores in table 4:

1. Forests (150)
2. Parks (171)
3. Public gardens (342)
4. Grasslands (374)
5. (near road) Trees (427)
6. (near road) Grass (468)

Based on all rankings, (near road) grass influences the respondents' wellbeing the least, as it allows for the least physical activity, social interaction, stress release and attention restoration. As explained, these factors make up the concept of wellbeing in this research. Both stress release and the restoration of attention indicate improved mental health.

(Near road) trees also appear to have little impact on wellbeing, in comparison to the other types of urban green, as it was placed fifth in each ranking. Grasslands placed fourth in each ranking, public gardens placed third in each ranking. The highest-ranked type of urban green in three of the four

questions was parks, while forest came second. The responses show that forest was ranked highest as the type of urban green that allows for the most stress release.

By combining the various rankings, the third sub-question can be answered:

'*What type of urban green has the most impact on wellbeing?'*

The rankings made by the respondents show that parks have the most impact on wellbeing. They allow for the most physical activity, social interaction and restores the attention span the most. They are ranked second place for the type of urban green that allows for the most stress release. Groningen city dwellers find that forests allow for the most stress release.

For the most part, a study by Payne et al (1998), in which park users provided self-reported data, showed the same results as this current study. Here, the results showed that urban parks promote physical activity and improve health. However, the Groningen city dwellers responses show that forests allow for more stress release than parks do.

5.4 Nuisances

The next question regarded nuisances in green spaces. The respondent could select multiple answers.

- Which nuisances discourage you from partaking in activities in green spaces?

This question resulted in the following responses:

Nuisance	Number of respondents
None	30
The presence of animals	7
Noise nuisance from people in the green space	17
Noise nuisance from traffic close to the green space	43
The presence of pollinated plants that cause allergies (e.g. hay fever)	12
Other, namely	13

Table 5: Multiple answer responses to the question 'Which nuisances discourage you from partaking in activities in green spaces?'

The open-ended questions resulted in mainly Dutch responses. For the purpose of this research, each response has been translated into English. For the original responses, see Appendix 2.

The thirteen respondents who answered 'other, namely' to the question 'which nuisances discourage you from partaking in green spaces?' found the following nuisances to be discouraging:

Nuisance	Number of respondents
Litter	4
Animal droppings	4
Overcrowding / too many people	5
Unsavoury types	1
Alcohol and drug use	1

Table 6: Open-ended responses to the question 'Which nuisances discourage you from partaking in activities in green spaces?'

Tables 5 and 6 show that 'noise nuisance from traffic close to the green space' is the most discouraging nuisance, followed by 'noise nuisance from people close to the green space'.

The last section of the survey consisted of six open-ended questions regarding nuisances in each type of urban green. This resulted in a wide range of answers. For the purpose of ease, the responses that occur frequently are discussed here. The other responses can be seen in their original language in Appendix 2 and the translated version, including a categorisation of the answers, can be seen in Appendix 4.

- Which nuisance(s) in parks do you find discouraging?

'Litter' was the most frequent response, with 21 respondents giving this response. The second most frequent response was 'overcrowding / too many people', with 19 responses. 'Animal droppings' was mentioned 17 times. Examples include dog and geese droppings.

Noise nuisance was also a frequent response. 'Noise nuisance' itself was mentioned 6 times, however, similar answers included loud music (with 5 responses) and noise from traffic (with 4 responses).

- Which nuisance(s) in forests do you find discouraging?

'Litter' was again the most frequent response, with 16 responses. ''Overcrowding / too many people' placed second as most discouraging nuisance with 13 responses. 'Unleashed dogs' was mentioned 7 times

Traffic was also a frequent response. 'Traffic' itself was mentioned 4 times. Similar answers included 'noise and smell nuisance from traffic', 'noise nuisance from traffic' and 'nearby roads'.

- Which nuisance(s) in (near road) trees do you find discouraging?

The two most frequent responses to this question were 'litter' and 'traffic', both with 9 responses. However, multiple responses are similar to 'traffic'. These include 'noise and smell nuisance from traffic', 'traffic safety', 'people who drive too fast', 'noise nuisance from traffic'.

Another frequent response, with 7 responses, was 'animal droppings'. Examples given by the respondents include dog and bird droppings.

- Which nuisance(s) in (near road) grass do you find discouraging?

'Animal droppings' was the most frequent response, with 15 respondents giving this response. This is followed by 'litter', with 13 responses. 'Traffic' itself was mentioned 9 times, but similar answers such as 'noise and smell nuisance form traffic', 'traffic safety', 'noise nuisance from traffic' and 'too much traffic' indicate that traffic, in general, is the most discouraging nuisance in regards to this question.

- Which nuisance(s) in public gardens do you find discouraging?

'Overcrowding / too many people' was mentioned 12 times, making it the most discouraging nuisance in regards to this question. With 9 responses 'litter' was the second most discouraging nuisance.

Noise nuisance was also a frequent response. Similar answers include 'noise nuisance from traffic', 'music' and 'loud people'.

- Which nuisance(s) in grasslands do you find discouraging?

Two nuisances were mentioned most frequently; 'animal droppings' with 11 responses, and 'litter' with 10 responses. Examples given by the respondents for animal droppings include cow and dog droppings.

Other nuisances included 'animals' and 'traffic'.

With the analysis of these nuisance questions the fourth sub-question can be answered:

What type of nuisances discourages city dwellers from partaking in activities in the various types of urban green being studied?

Responses show that 'litter', 'overcrowding' and 'animal droppings' are generally the most discouraging nuisances for Groningen city dwellers. According to the respondents, 'litter' is in the top three most discouraging nuisances of all six types of urban green, making it the most discouraging nuisance for urban green. The second most common nuisance is 'animal droppings', followed by 'overcrowding'.

Combining all nuisance questions shows that noise nuisance is also a serious issue for people. Various noise sources are named in the responses, however, noise nuisance from traffic is the most discouraging noise nuisance according to the respondents.

The study conducted by Bertram and Rehdanz (2015) reported several nuisances in urban green spaces that negatively affect a person's wellbeing, such as the presence of certain plants and animals and unilluminated spaces. However, litter and overcrowding were not mentioned in this study.

An interesting result is that even though 'parks' was ranked highest in most questions regarding urban green, the respondents also indicated the most nuisances for this type of urban green. This shows that even though many nuisances in urban parks discourage the respondents, they still value it as the highest-ranking urban green space for their physical activities, social interaction, and restoration of their attention.

5.5 Main Research Question

By combining the results from the Likert scale and ranking survey questions the main research question can now be answered:

How and to what extent does urban green affect the wellbeing of city dwellers?

The data shows that respondents find their wellbeing to be positively affected by urban green. The respondents indicate that urban green gives them more possibilities for social interaction, as well as preferring social interaction in green spaces over social interaction in a built-up urban area. The results show that Groningen city dwellers' physical health is improved by exposure to urban green. It also encourages them to partake in physical activities and to use active modes of transportation. Groningen city dwellers find that urban green improves their mental health and they feel more relaxed and their attention span is improved after exposure to urban green. Groningen city dwellers find that urban parks have the most influence on their wellbeing.

These main results are similar to previously conducted studies, in which stress is reduced and attention is restored after exposure to urban green (Bertram & Rehdanz, 2015; Kondo et al. 2018; Wolf et al. 2020), physical activities, such as active transportation modes, are promoted and preferred in urban green spaces (Tzoulas et al. 2007; De Vries et al. 2003; Wolf et al. 2020) and finally, urban green improves social interaction and social cohesion to one's environment (Sadeghian & Vardanyan, 2013).

6. Conclusion

This chapter provides a summary of the main study results and the data collection is reflected upon. It provides a hindsight reflection on the survey design and the data that followed from the respondents. This chapter also makes suggestions for further research based on this study's limitations.

6.1 Results

The data shows that parks have the most positive impact on physical activity, social interaction and attention span restoration. Forests allow for the most stress release. This shows that parks are the type of urban green that has the most impact on Groningen city dwellers' wellbeing.

Litter appears to be the most discouraging nuisance according to Groningen city dwellers. Other nuisances that are frequently said to be discouraging include overcrowding and animal droppings. Noise nuisance and traffic is also a frequent nuisance as it appears in various forms in the responses, such as loud music and people, noise and smell nuisance from traffic, etc.

The respondents find their wellbeing to be positively affected by urban green. It gives them more possibilities for social interaction and it improves their physical health. Groningen city dwellers find that urban green improves their mental health and attention span, as well as that they feel more relaxed after exposure to urban green.

The results support the previously made hypotheses in section 3.5.

6.2 Reflection on Data Collection

The survey design did not show any issues and as no questions were asked by the respondents, the survey was clear and understandable to the respondents as well. All the survey questions provided useful data for this research. The demographics showed that the respondents' age and identification weren't equally distributed among the categories and one could therefore argue that the research, for example, focused more on the wellbeing of women in Groningen than of all the city dwellers.

The data was self-reported, which means that the quality of data can be argued about. Chong-Ho (2020) states that a concern regarding self-reported data is whether a subject is able to accurately recall past behaviour. The self-reported data does not provide a medical or exact indication of a person's wellbeing. However, it does provide information on how that person feels, and on how that person experiences urban green spaces. This could then provide a motive to continue with observational research in which exact and medical data can be collected.

The responses show that several questions in which the respondent was asked to rank the types of urban green appeared to be having some missing values. It is unclear how these missing values came to be, as each respondent completed the survey. However, these missing responses can result in some inaccuracies in the calculation of the final ranking.

Another issue that arose during the data analysis was that the survey questions had provided data from which statistical tests could not be done, thus the data was not able to statistically prove a relationship between urban green and wellbeing.

6.3 Future Research & Implications

As explained, the self-reported data has some limitations. Therefore, a suggestion for future research could include medical research, in which more exact data is collected on the city dwellers' wellbeing. This research focuses on the aspects of mental health which were based on existing literature. Another suggestion for future research could include what health and wellbeing outcomes are

sought after in the city of Groningen and how these outcomes can be achieved through the implication of specific spatial plans. Future research can also include how to minimise the nuisances that discourage people from partaking in activities in urban green spaces, thus promoting the usage of green spaces.

This research has shown the effects of urban green on city dwellers' wellbeing and by combining this information with the existing data on the effects of urban green on the environment, this study has stressed the importance of including urban green in spatial planning in an urbanising world.

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8. Appendices

8.1 Appendix 1 – Survey Design

The order of questions was changed in the process of designing the survey. Therefore, the question numbers are not in order. The order in which they are displayed here is the same order in which they were shown on the survey.

Description

Dear respondent,

For my bachelor thesis at the University of Groningen, I am researching how and to what extent green spaces in the urban environment affect the wellbeing of Groningen city dwellers.

Answering the survey takes about 3 minutes. This survey is completely anonymous and your answers will remain confidential. The data will be used only for the analysis by me.

Thank you for taking the time to answer my survey. I would appreciate it if you could share the survey with your friends and family.

If you have any questions about the survey you can contact me at l.daalman@student.rug.nl

Explanation

Below are 20 statements and questions about urban green and wellbeing. For clarification on each type of urban green, please see the following examples:

Park: Stadspark, Noorderplantsoen

Figure 11: Noorderplantsoen (Wanda's wereld, 2021)

Forest: Sterrebos, het Roegebos

Figure 12: Sterrebos (Wikipedia,2021)

(Near road) trees

Figure 13: (near road) Trees (Visser / Bomenstichting Den Haag, 2015)

(Near road) grass

Figure 14: (near road) Grass (Beijer / Plattelandoij's Blog, 2012)

Public gardens: Prinsentuin

Figure 15: Prinsentuin (VisitGroningen, 2021)

Grasslands: Kardinge

Figure 16: Kardinge (Holwerda / Groningen Cityblog, 2020)

<u>Requirements</u>

Q6. Do you live in the city of Groningen?

- Yes
- No

<u>Demographics</u>

Q1. What is your age?

- Under 18
- 18-24
- 25-34
- 35-44
- 45-54
- 55-64
- 65-74
- 75-84
- 85 or older

Q3. How do you identify?

- ○ Male
- ○ Female
- ○ Non-binary
- ○ Prefer not to say
- ○ Other

Statements

Q7. Please indicate to what extent you agree with the following statements:

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Urban green gives me more possibilities for social interaction.	○	○	○	○	○
I prefer social interaction in an urban green space, as opposed to a built-up urban area.	○	○	○	○	○
Urban green improves my social cohesion in Groningen.	○	○	○	○	○
Proximity to an urban green space encourages me to participate in physical activities.	○	○	○	○	○
Urban green encourages me to use an active mode of transportation such as cycling or walking, rather than taking the car or public transport.	○	○	○	○	○
Exposure to urban green positively affects my physical health.	○	○	○	○	○
I feel more relaxed after being exposed to urban green.	○	○	○	○	○
My attention span is improved after being exposed to urban green.	○	○	○	○	○
Exposure to urban green positively affects my mental health.	○	○	○	○	○

Multiple choice / open-ended questions

For each of the following questions please put in order the possible answers from most(1) to least(6). You can move an answer by dragging it up or down.

Q9. Which type of urban green allows for the most physical activity?

Parks
Forests
(near road) Trees
(near road) Grass
Public gardens
Grasslands

Q10. Which type of urban green allows for the most social interaction?

Parks
Forests
(near road) Trees
(near road) Grass
Public gardens
Grasslands

Q11. Which type of urban green restores your attention span the most?

Parks
Forests
(near road) Trees
(near road) Grass
Public gardens
Grasslands

Q12. Which type of urban green allows for the most stress release?

Parks
Forests
(near road) Trees
(near road) Grass
Public gardens
Grasslands

For the following questions please select all that apply.

Q14. Which nuisances discourage you from partaking in activities in green spaces?

- None
- The presence of animals
- Noise nuisance from people in the green space
- Noise nuisance from traffic close to the green space
- The presence of pollinated plants that cause allergies, e.g. hay fever
- Other, namely

For the following questions please type in your answer(s). You can leave the text box empty if no answer applies.

Q16. Which nuisance(s) in parks do you find most discouraging?

Q17. Which nuisance(s) in forests do you find most discouraging?

Q18. Which nuisance(s) in (near road) trees do you find most discouraging?

Q19. Which nuisance(s) in (near road) grass do you find most discouraging?

Q20. Which nuisance(s) in public gardens do you find most discouraging?

Q21. Which nuisance(s) in grasslands do you find most discouraging?

Thank you for your time spent taking this survey.

Your response has been recorded.

8.2 Appendix 2 – Raw Data

UserLanguage	Q6	Q1	Q3	Q3_5_TEXT	Q7_1	Q7_2	Q7_3	Q7_4	Q7_5
NL	Yes	18-24	Female		Agree	Neutral	Agree	Agree	Neutral
NL	Yes	18-24	Female		Agree	Agree	Agree	Strongly agree	Agree
NL	Yes	18-24	Female		Agree	Strongly agree	Agree	Strongly agree	Agree
NL	Yes	18-24	Female		Agree	Agree	Agree	Strongly agree	Agree
NL	Yes	35 - 44	Female		Agree	Agree	Agree	Strongly agree	Strongly agree
NL	Yes	under 18	Male		Agree	Neutral	Neutral	Strongly agree	Agree
NL	Yes	18-24	Female		Agree	Disagree	Disagree	Agree	Agree
NL	Yes	18-24	Female		Agree	Agree	Neutral	Agree	Strongly agree
NL	Yes	18-24	Female		Strongly agree	Agree	Strongly agree	Agree	Agree
NL	Yes	18-24	Female		Agree	Strongly agree	Neutral	Disagree	Agree
NL	Yes	35 - 44	Male		Agree	Agree	Agree	Strongly agree	Strongly agree
NL	Yes	18-24	Male		Agree	Agree	Agree	Strongly agree	Strongly agree
NL	Yes	35 - 44	Female		Strongly agree	Strongly agree	Neutral	Strongly agree	Strongly agree
NL	Yes	18-24	Female		Agree	Agree	Neutral	Neutral	Neutral
NL	Yes	35 - 44	Female		Agree	Agree	Neutral	Strongly agree	Strongly agree
NL	Yes	18-24	Female		Agree	Agree	Agree	Agree	Neutral
NL	Yes	45 - 54	Female		Neutral	Agree	Agree	Agree	Agree
NL	Yes	35 - 44	Female		Agree	Agree	Neutral	Agree	Strongly agree
NL	Yes	18-24	Female		Agree	Agree	Agree	Strongly agree	Strongly agree
NL	Yes	45 - 54	Male		Agree	Neutral	Agree	Neutral	Agree
NL	Yes	18-24	Female		Agree	Neutral	Neutral	Agree	Strongly agree
NL	Yes	35 - 44	Male		Agree	Neutral	Agree	Agree	Disagree
NL	Yes	45 - 54	Female		Agree	Neutral	Neutral	Agree	Agree
NL	Yes	45 - 54	Female		Strongly agree	Strongly agree	Strongly agree	Agree	Strongly agree
NL	Yes	45 - 54	Female		Agree	Neutral	Neutral	Neutral	Agree
NL	Yes	35 - 44	Male		Strongly agree	Agree	Agree	Agree	Agree
NL	Yes	18-24	Male		Agree	Disagree	Agree	Neutral	Disagree
NL	Yes	under 18	Male		Disagree	Neutral	Disagree	Agree	Disagree
NL	Yes	35 - 44	Female		Strongly agree	Strongly agree	Strongly agree	Strongly agree	Strongly agree
NL	Yes	25 - 34	Female		Strongly agree	Disagree	Agree	Agree	Strongly agree
NL	Yes	25 - 34	Female		Neutral	Agree	Agree	Agree	Disagree
NL	Yes	55 - 64	Male		Agree	Disagree	Agree	Agree	Agree
NL	Yes	45 - 54	Female		Strongly agree	Agree	Agree	Agree	Strongly agree
NL	Yes	45 - 54	Female		Agree	Strongly agree	Agree	Agree	Strongly agree
NL	Yes	25 - 34	Male		Neutral	Agree	Agree	Neutral	Agree
NL	Yes	55 - 64	Female		Neutral	Agree	Agree	Agree	Agree
NL	Yes	35 - 44	Male		Agree	Agree	Agree	Strongly agree	Agree
NL	Yes	18-24	Female		Agree	Agree	Agree	Agree	Agree
NL	Yes	45 - 54	Female		Strongly agree	Disagree	Agree	Agree	Agree
NL	Yes	under 18	Female		Agree	Agree	Strongly agree	Agree	Agree
NL	Yes	45 - 54	Female		Neutral	Neutral	Neutral	Strongly agree	Neutral
NL	Yes	18-24	Female		Agree	Agree	Agree	Strongly agree	Strongly agree
NL	Yes	45 - 54	Female		Neutral	Agree	Agree	Disagree	Disagree
EN	No								
NL	No								
NL	Yes	18-24	Male		Agree	Agree	Agree	Agree	Neutral
NL	Yes	35 - 44	Female		Agree	Strongly agree	Neutral	Agree	Agree
NL	No								
NL	Yes	45 - 54	Female		Agree	Agree	Agree	Strongly agree	Strongly agree
NL	Yes	35 - 44	Female		Strongly agree	Neutral	Agree	Agree	Agree
NL	Yes	18-24	Male		Agree	Agree	Agree	Agree	Agree
NL	Yes	35 - 44	Male		Agree	Agree	Agree	Disagree	Strongly disagree
NL	Yes	35 - 44	Female		Agree	Agree	Agree	Strongly agree	Strongly agree
NL	Yes	under 18	Female		Strongly agree	Disagree	Agree	Neutral	Agree
NL	Yes	65 - 74	Male		Strongly agree	Neutral	Agree	Strongly agree	Strongly agree
NL	Yes	35 - 44	Female		Disagree	Agree	Neutral	Agree	Strongly agree
NL	Yes	35 - 44	Male		Strongly agree	Strongly agree	Strongly agree	Strongly agree	Strongly agree
NL	Yes	45 - 54	Female		Strongly agree	Neutral	Agree	Agree	Strongly agree
NL	No								
NL	Yes	55 - 64	Male		Strongly agree	Strongly agree	Strongly agree	Strongly agree	Strongly agree
NL	Yes	45 - 54	Male		Agree	Agree	Agree	Strongly agree	Agree
NL	Yes	18-24	Female		Agree	Neutral	Neutral	Agree	Strongly agree
NL	Yes	55 - 64	Male		Neutral	Agree	Agree	Agree	Disagree
NL	No								
NL	Yes	18-24	Female		Agree	Neutral	Agree	Agree	Neutral
NL	Yes	45 - 54	Male		Agree	Neutral	Agree	Agree	Agree
NL	No								
NL	No								
NL	No								
NL	Yes	45 - 54	Other	Mens	Strongly agree	Strongly agree	Strongly agree	Strongly agree	Strongly agree
NL	No								
NL	Yes	25 - 34	Female		Agree	Neutral	Agree	Agree	Disagree
NL	Yes	18-24	Female		Neutral	Disagree	Neutral	Strongly agree	Agree
NL	Yes	18-24	Male		Agree	Agree	Neutral	Agree	Neutral
NL	Yes	55 - 64	Female		Agree	Strongly agree	Strongly agree	Strongly agree	Strongly agree
EN	Yes	18-24	Female		Strongly agree	Strongly agree	Strongly agree	Agree	Agree
NL	No								
NL	Yes	45 - 54	Female		Neutral	Strongly agree	Agree	Agree	Agree
NL	Yes	45 - 54	Female		Neutral	Neutral	Disagree	Agree	Agree
NL	Yes	45 - 54	Male		Agree	Neutral	Agree	Agree	Agree
NL	Yes	55 - 64	Male		Strongly disagree	Agree	Neutral	Neutral	Strongly agree
NL	Yes	55 - 64	Male		Strongly agree	Strongly agree	Strongly agree	Strongly agree	Agree
NL	Yes	45 - 54	Male		Agree	Neutral	Agree	Agree	Agree
NL	Yes	45 - 54	Male		Neutral	Strongly disagree	Strongly disagree	Agree	Strongly disagree
NL	Yes	45 - 54	Male		Agree	Agree	Agree	Agree	Disagree
NL	Yes	45 - 54	Male		Agree	Agree	Agree	Agree	Neutral
NL	Yes	45 - 54	Male		Strongly agree	Neutral	Agree	Agree	Strongly agree
NL	Yes	65 - 74	Male		Strongly disagree	Agree	Neutral	Neutral	Agree
NL	Yes	45 - 54	Male		Agree	Agree	Agree	Neutral	Agree
NL	Yes	75 - 84	Female		Strongly agree	Strongly agree	Agree	Agree	Strongly agree
NL	Yes	35 - 44	Female		Agree	Neutral	Neutral	Agree	Agree
NL	Yes	55 - 64	Male		Agree	Neutral	Agree	Strongly agree	Strongly agree
NL	Yes	18-24	Male		Neutral	Agree	Agree	Agree	Agree
NL	Yes	55 - 64	Female		Agree	Strongly agree	Agree	Agree	Strongly agree
NL	Yes	18-24	Female		Neutral	Agree	Neutral	Agree	Strongly agree
NL	Yes	55 - 64	Female		Agree	Agree	Agree	Strongly agree	Strongly agree
NL	Yes	55 - 64	Male		Neutral	Agree	Agree	Agree	Agree
NL	Yes	75 - 84	Male		Agree	Agree	Disagree	Agree	Disagree
NL	Yes	75 - 84	Female		Strongly agree	Strongly agree	Neutral	Agree	Agree
NL	Yes	55 - 64	Male		Agree	Neutral	Agree	Neutral	Agree
NL	Yes	25 - 34	Male		Neutral	Disagree	Neutral	Agree	Agree
NL	Yes	25 - 34	Non-binary		Agree	Neutral	Neutral	Strongly agree	Strongly agree
NL	Yes	65 - 74	Male		Strongly agree	Strongly agree	Strongly agree	Strongly agree	Strongly agree
NL	Yes	18-24	Male		Strongly agree	Agree	Agree	Agree	Agree
EN	Yes	18-24	Non-binary		Agree	Neutral	Agree	Agree	Agree

Q7_6	Q7_7	Q7_8	Q7_9	Q9_1	Q9_2	Q9_3	Q9_4	Q9_5	Q9_6	Q10_1	Q10_2	Q10_3
Agree	Agree	Agree	Strongly agree	1	2	4	3	6	5	1	2	5
Neutral	Agree	Disagree	Agree	1	2	6	5	3	4	2	3	6
Agree	Agree	Neutral	Agree	1	2	5	6	4	3	1	2	6
Strongly agree	Strongly agree	Agree	Agree	1	2	6	5	3	4	1	3	6
Agree	Strongly agree	Neutral	Strongly agree	1	2	5	6	4	3	1	3	5
Neutral	Agree	Agree	Agree	1	3	5	4	6	2	1	2	6
Agree	Agree	Agree	Agree	2	1	5	3	6	4	1	3	5
Agree	Strongly agree	Strongly agree	Agree	3	1	5	2	6	4	1	2	4
Agree	Strongly agree	Strongly agree	Strongly agree	2	1	3	5	6	4	1	3	4
Agree	Agree	Agree	Agree	1	2	5	6	3	4	1	2	5
Strongly agree	Strongly agree	Agree	Strongly agree	1	2	4	6	5	3	1	2	5
Strongly agree	Strongly agree	Strongly agree	Strongly agree	2	1	5	6	4	3	1	2	6
Strongly agree	Strongly agree	Strongly agree	Strongly agree	1	2	4	6	3	5	1	4	6
Agree	Agree	Agree	Agree	1	3	5	6	4	2	1	2	5
Strongly agree	Agree	Agree	Agree	1	2	4	5	6	3	1	2	5
Agree	Agree	Agree	Agree	1	2	5	6	3	4	1	2	5
Agree	Agree	Agree	Agree	1	2	3	5	4	6	2	1	3
Agree	Agree	Agree	Agree	2	1	4	5	3	6	1	3	4
Strongly agree	Strongly agree	Agree	Strongly agree	1	3	5	6	4	2	1	3	5
Agree	Strongly agree	Agree	Agree	1	4	3	6	2	5	1	3	6
Agree	Agree	Neutral	Strongly agree	1	3	4	2	6	5	1	5	6
Agree	Neutral	Neutral	Agree	4	1	2	3	6	5			
Agree	Agree	Disagree	Strongly agree	2	1	5	4	3	6	1	3	5
Strongly agree	Strongly agree	Strongly agree	Strongly agree	2	1	5	6	3	4	2	3	5
Agree	Agree	Agree	Agree	3	1	5	2	6	4	1	2	3
Agree	Agree	Agree	Agree	1	2	3	4	5	6	1	4	5
Agree	Agree	Agree	Agree	1	3	4	6	5	2	1	5	3
Strongly agree	Agree	Agree	Agree	2	1	6	5	3	4	2	1	6
Strongly agree	Strongly agree	Strongly agree	Strongly agree	2	1	6	5	4	3	1	2	5
Agree	Strongly agree	Strongly agree	Agree	1	2	6	5	3	4	1	3	6
Agree	Agree	Agree	Agree	2	1	6	5	3	4	2	1	5
Strongly disagree	Neutral	Disagree	Agree	1	3	5	4	2	6	1	3	4
Agree	Agree	Agree	Agree	1	3	5	6	2	4	1	3	6
Strongly agree	Strongly agree	Neutral	Strongly agree	1	2	4	5	3	6	1	2	3
Agree	Neutral	Neutral	Agree	1	2	6	5	4	3	1	2	3
Agree	Agree	Agree	Strongly agree	2	1	5	4	3	6	1	3	6
Strongly agree	Agree	Neutral	Agree	2	1	6	3	5	4	1	2	4
Agree	Strongly agree	Agree	Agree	1	2	4	5	6	3	2	1	6
Strongly agree	Strongly agree	Agree	Agree	1	2	6	5	3	4	1	3	6
Strongly agree	Strongly agree	Neutral	Strongly agree	2	1	6	5	3	4	1	3	6
Agree	Strongly agree	Neutral	Agree	3	1	4	5	6	2	2	4	6
Strongly agree	Strongly agree	Agree	Strongly agree	4	1	2	5	6	3	2	1	3
Neutral	Agree	Neutral	Agree	1	5	2	3	4	6	1	2	4
Agree	Agree	Neutral	Agree	2	1	6	5	3	4	2	1	6
Agree	Strongly agree	Neutral	Agree	2	1	5	6	4	3	1	2	5
Strongly agree	Strongly agree	Neutral	Strongly agree	2	4	3	5	1	6	1	3	4
Agree	Agree	Neutral	Agree	1	2	6	5	4	3	1	3	5
Agree	Agree	Neutral	Agree	1	2	4	5	3	6	1	3	4
Agree	Agree	Agree	Agree	1	2	5	4	3	6	1	2	4
Strongly agree	Strongly agree	Strongly agree	Strongly agree	1	2	6	5	3	4	1	3	4
Agree	Neutral	Neutral	Strongly agree	2	1	5	6	4	3	1	2	4
Strongly agree	Strongly agree	Agree	Strongly agree	2	4	3	1	6	5	1	3	6
Agree	Agree	Agree	Agree	2	1	4	6	3	5	2	1	4
Strongly agree	Strongly agree	Strongly agree	Strongly agree	1	2	3	5	4	6	1	2	3
Strongly agree	Strongly agree	Strongly agree	Strongly agree	2	1	6	5	3	4	1	4	5
Strongly agree	Strongly agree	Strongly agree	Strongly agree	1	2	6	5	4	3	1	3	6
Strongly agree	Agree	Agree	Strongly agree	1	2	4	5	6	3	1	5	3
Strongly agree	Strongly agree	Strongly agree	Strongly agree	1	2	6	5	4	3	1	2	6
Agree	Agree	Neutral	Agree	1	2	4	3	5	6	1	2	4
Agree	Agree	Neutral	Agree	1	2	3	4	5	6	1	2	3
Strongly agree	Agree	Agree	Strongly agree	2	1	4	3	6	5	1	3	6
Strongly agree	Strongly agree	Strongly agree	Strongly agree	2	1	5	6	3	4	1	3	5
Agree	Agree	Neutral	Agree	1	2	5	6	3	4	1	2	5
Agree	Strongly agree	Neutral	Strongly agree	1	2	5	3	6	4	1	2	6
Neutral	Agree	Neutral	Neutral	1	2	6	5	4	3	2	3	6
Strongly agree	Strongly agree	Agree	Strongly agree	1	3	6	4	5	2	1	3	6
Strongly agree	Strongly agree	Neutral	Agree	1	6	5	2	3	4	1	3	5
Agree	Agree	Neutral	Agree	3	2	5	6	1	4	1	4	5
Agree	Agree	Agree	Agree	4	1	5	6	3	2	1	3	4
Agree	Agree	Agree	Agree	1	2	4	5	3	6	1	2	5
Agree	Agree	Agree	Agree	1	2	6	3	4	5	1	2	4
Strongly agree	Agree	Strongly agree	Strongly agree	1	3	5	2	4	6	1	3	4
Agree	Strongly agree	Neutral	Strongly agree	2	1	4	5	3	6	2	1	4
Agree	Strongly disagree	Neutral	Agree	1	4	2	3	5	6	1	4	2
Agree	Agree	Disagree	Agree	2	1	3	6	5	4	1	2	5
Agree	Agree	Agree	Agree	1	2	3	6	5	4	1	2	6
Strongly agree	Strongly agree	Agree	Strongly agree	2	1	4	6	3	5	1	2	6
Agree	Neutral	Neutral	Neutral	1	3	4	6	2	5			
Agree	Agree	Agree	Agree	2	1	4	5	3	6	1	2	4
Strongly agree	Strongly agree	Agree	Strongly agree	1	2	4	6	3	5	1	2	4
Strongly agree	Strongly agree	Agree	Strongly agree	1	2	5	6	4	3	1	4	5
Strongly agree	Agree	Strongly agree	Strongly agree	2	1	3	4	5	6	1	4	5
Strongly agree	Strongly agree	Neutral	Strongly agree	2	1	5	6	4	3	1	4	5
Strongly agree	Strongly agree	Neutral	Agree	1	2	5	6	4	3	1	3	5
Agree	Strongly agree	Agree	Agree	1	2	4	3	6	5	1	3	5
Strongly agree	Agree	Agree	Agree	3	1	6	5	4	2	1	3	4
Neutral	Disagree	Disagree	Neutral	2	1	5	6	4	3	2	3	5
Neutral	Agree	Neutral	Strongly agree	2	1	4	3	6	5	2	1	5
Strongly agree	Agree	Neutral	Agree	2	1	4	3	6	5	1	2	5
Agree	Agree	Agree	Agree	1	2	6	5	3	4	1	2	5
Agree	Agree	Neutral	Agree	4	1	5	2	6	3	1	2	6
Strongly agree	Strongly agree	Agree	Strongly agree	3	2	5	1	6	4	1	2	6
Strongly agree	Strongly agree	Agree	Agree	1	3	5	6	2	4	1	3	6
Agree	Agree	Neutral	Strongly agree	2	1	5	6	3	4	1	2	5
Agree	Agree	Neutral	Agree	5	1	3	2	6	4	2	4	5

Q10_4	Q10_5	Q10_6	Q11_1	Q11_2	Q11_3	Q11_4	Q11_5	Q11_6	Q12_1	Q12_2	Q12_3	Q12_4	Q12_5	Q12_6
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4	5	2	1	2	3	6	5	4	1	2	3	5	6	4
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2	3	4	1	5	6	2	3	4	2	1	6	4	5	3
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6	4	5	2	1	3	5	6	4	2	1	4	6	3	5
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2	4	5	1	2	6	5	3	4	1	2	6	5	3	4
6	3	5	2	1	4	6	3	5	3	1	4	6	2	5
4	5	6												
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5	2	4	1	2	4	5	3	6	1	2	5	6	3	4
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5	3	6	1	2	3	4	5	6	1	2	4	5	6	3
4	5	6												
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4	2	6	1	2	3	4	6	5	1	2	3	4	5	6
6	3	2							1	2	3	4	6	5
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3	5	6	1	5	2	3	4	6	1	2	3	4	5	6
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6	1	3	4	1	5	6	2	3	4	1	5	6	2	3

Q14	Q14_6_TEXT
Noise nuisance from traffic close to the green space,Other, namely	Zwerfafval, dieren poep
None	
Noise nuisance from traffic close to the green space	
None	
Noise nuisance from traffic close to the green space	
Noise nuisance from traffic close to the green space,The presence of pollinated plants that cause allergies, e.g. hay fever	
Noise nuisance from people in the green space,Noise nuisance from traffic close to the green space	
The presence of pollinated plants that cause allergies, e.g. hay fever	
None	
Noise nuisance from traffic close to the green space	
Noise nuisance from people in the green space,Noise nuisance from traffic close to the green space	
None	
Noise nuisance from people in the green space	
Other, namely	Drukte van mensen
None	
The presence of pollinated plants that cause allergies, e.g. hay fever	
The presence of animals,Noise nuisance from traffic close to the green space,The presence of pollinated plants that cause allergies, e.g. hay fever	
Noise nuisance from people in the green space	
Noise nuisance from traffic close to the green space	
None	
None	
The presence of animals	
None,Other, namely	Te erge drukte/te veel mensen
Noise nuisance from traffic close to the green space,The presence of pollinated plants that cause allergies, e.g. hay fever	
Noise nuisance from traffic close to the green space	
Noise nuisance from traffic close to the green space,The presence of pollinated plants that cause allergies, e.g. hay fever	
Other, namely	Druk bezochte plekken waardoor er weinig rust is.
Noise nuisance from people in the green space	
The presence of animals,Noise nuisance from traffic close to the green space,Other, namely	Hondenpoep!!!!!!
Noise nuisance from traffic close to the green space	
Noise nuisance from traffic close to the green space	
None	
None	
None	
The presence of animals	
Noise nuisance from people in the green space,Noise nuisance from traffic close to the green space	
Noise nuisance from people in the green space,Noise nuisance from traffic close to the green space	
Noise nuisance from traffic close to the green space,The presence of pollinated plants that cause allergies, e.g. hay fever	
Noise nuisance from traffic close to the green space,Other, namely	Zwerfafval
None	
Other, namely	Ongure types
Noise nuisance from people in the green space	
Other, namely	Hoeveelheid mensen
None	
Noise nuisance from traffic close to the green space	
Noise nuisance from traffic close to the green space	
Noise nuisance from traffic close to the green space,Other, namely	Hondenpoep
None	
None	
None	
The presence of animals,Noise nuisance from traffic close to the green space	
None	
Noise nuisance from traffic close to the green space	
None	
None	
None	
Noise nuisance from traffic close to the green space	
Noise nuisance from people in the green space,Noise nuisance from traffic close to the green space,The presence of pollinated plants that cause allergies, e.g. hay fever	
The presence of animals	
Noise nuisance from traffic close to the green space,The presence of pollinated plants that cause allergies, e.g. hay fever	
Noise nuisance from traffic close to the green space	
None	
The presence of pollinated plants that cause allergies, e.g. hay fever	
Noise nuisance from traffic close to the green space	
Noise nuisance from traffic close to the green space	
Noise nuisance from traffic close to the green space	
Noise nuisance from traffic close to the green space	
None	
Noise nuisance from people in the green space	
None	
Noise nuisance from traffic close to the green space	
The presence of pollinated plants that cause allergies, e.g. hay fever	
None	
None	
None	
None	
The presence of pollinated plants that cause allergies, e.g. hay fever	
None	
Noise nuisance from people in the green space,Noise nuisance from traffic close to the green space	
None	
Noise nuisance from people in the green space,Noise nuisance from traffic close to the green space	
Noise nuisance from traffic close to the green space	
None,The presence of pollinated plants that cause allergies, e.g. hay fever	
Noise nuisance from traffic close to the green space	
Noise nuisance from traffic close to the green space,Other, namely	Viezigheid zoals afval of poep
Noise nuisance from people in the green space,Noise nuisance from traffic close to the green space	
The presence of animals,Noise nuisance from traffic close to the green space	
Noise nuisance from people in the green space,Noise nuisance from traffic close to the green space	
Noise nuisance from traffic close to the green space,Other, namely	Afval
Other, namely	Drank en drugs gebruik
The presence of pollinated plants that cause allergies, e.g. hay fever,Other, namely	Drukte
Noise nuisance from people in the green space,Noise nuisance from traffic close to the green space	
Noise nuisance from people in the green space,Noise nuisance from traffic close to the green space	
Noise nuisance from people in the green space,Noise nuisance from traffic close to the green space	
Noise nuisance from traffic close to the green space,The presence of pollinated plants that cause allergies, e.g. hay fever	

Q16	Q17
Afval, dieren poep	Teken
Te veel mensen	
Afval, te harde muziek, geluid en stank van auto's	Afval, te harde muziek, geluid en stank van auto's
Zwervers	Zwervers
Veel afval	Veel afval
Luidruchtig muziek	Nabije wegen
Dronken mensen	Loslopende honden
Drukt, veel mensen bij elkaar	N.v.t.
Drukte van andere bezoekers	Geen
Drukte van de hoeveelheid mensen	Drukte van hoeveelheid mensen
-	-
Veel mensen en weinig plek	Te dicht bebost en daardoor donker (zou dan minder snel alleen door bos lopen)
Geluidsoverlast, zwerfafval	Geluidsoverlast, zwerfafval
te veel mensen, niet genoeg zitplaatsen	klein bos, waardoor je binnen een kwartier er ook weer uit bent gelopen
Zwervers dealers	
Hondenpoep	
HuisDieren	
Loslopende enge honden	Loslopende honden
Hondenpoep	Geen
Geluidsoverlast	
Geluid	Smerigheid
Hondenpoep	Voor vrouwen alleen eng
Wilde ganzen, poep	Poep
Verkeer	Verkeer
Geen	Vaak drukte
Hondenpoep mensen die afval achterlaten	Hondenpoep mensen die afval achterlaten
Poep	Beestjes
Loslopende honden en hondenpoep	Buiten de laden begeven van wandelaars
Drukte	Drukte
Geen	Verkeer
Groepen die zich agressief gedragen onder invloed van drank/drugs	Zwerfafval
Honden uit laat gebied	Afval
Ongure types	Ongure types
Grote hoeveelheid (alcohol consumerende) mensen	Grote hoeveelheid mensen
Lawaai, te veel mensen, hondenpoep, afval	Hoeveelheid mensen
Té veel mensen	Te veel mensen
Zwerfvuil	Schreeuwende mensen
Teveel studenten tegelijk met bbq, hondenpoep	
	Loslopende grote honden
Teveel drukte	
Loslopende honden	Loslopende honden
Zwerfvuil	Zwerfvuil
Teveel hangjeugd	Loslopende honden
Verkeer	Verkeer
Geen	Geen
Loslopende honden	
Grote groepen mensen die luidruchtig zijn, geur of geluid van verkeer en afval	Insecten en afval
Loslopende honden	Loslopende honden
Mensen die roken	Drukte
Afval	Afval
Mensen die hun afval niet opruimen, mensen die geen respect hebben voor hun omgeving qua geluid bijvoorbeeld schreeuwers, brommer geluiden	
Zwerfafval	Zwerfafval
Afval (door te weinig prullenbakken)	Beestjes
Daklozen	Verkeer
Geluidsoverlast van verkeer	Geluidsoverlast van verkeer
Vehicles	Animals
Groepen jongeren met luide muziek	Loslopende honden
Auto	Geen
Afval	Afval
Jeugd zwervers hondenpoep	
Ontlasting	Nvt
Ghettoblaster	Harde muziek
Hondepoep	Asvalt
Uitwerpselen van dieren, los lopende honden	
Vervuiling	Beperking
Lawaai	
Hondenpoep & afval en lastige mensen	Geen
Drukte	Geen
Hooikoorts en	Hooikoorts
Rommel	Rommel
Afval, poep, drukte	Afval, poep, beestjes
Drukte,	Drukte, vuil, plassen, modder
Harde muziek en hondenpoep	Verkeerslawaai
Drukte en afval	Drukte en afval
Afval, te veel mensen	Te veel mensen
Te veel drank en drugs	Zwerfafval
Te veel mensen, mensen die afval achterlaten	Te veel mensen, mensen die afval achter laten
Onveilig gevoel, te druk	Te druk
Agressie	Zwerfafval
Drukte	Drukte
Scooters and bikes	If its next to a busy road

Q18	Q19
	Hondenpoep
De weg	De weg
Afval, geluid en stank van auto's	Afval, geluid en stank van auto's
Zwervers	Zwervers
Geen	Geen
Auto’s	Auto’s
	Loslopende honden
N.v.t.	N.v.t.
Verkeersveiligheid en verkeersgeluid	Verkeersveiligheid en verkeersgeluid
Drukte van de hoeveelheid mensen	Drukte van de hoeveelheid mensen
-	-
-	-
Zwerfvuil	Zwerfvuil
dat de kans er is dat als het donker is, een botsing met de boom	geen
Autos	Autos
lawaaige bomen	
Geen	Geluid van verkeer
	Hooikoorts
auto's	wind
Hondenpoep	Hondenpoep
Poep	Poep
Geen	Geen
Afval	Afval
Geen	Slecht onderhouden
Vogel kak	Honden poep
Afval	.
Geen	Geen
Verkeer	Verkeer
Hoeveelheid mensen, afval, geen zitplaats	
Te veel mensen	
	Zwerfvuil
	ZwerfAfval
Als je er één raakt ben je dood	
	Hondenpoep
Poepende honden	Poepende honden
Zwerfvuil	Zwerfvuil
Verkeer	Verkeer
Verkeer	Verkeer
Druk verkeer	Druk verkeer
Afval	Afval
Mensen die (te) hard rijden. Veel (les)wagens	Dat mensen/ bedrijven klakkeloos over het gras rijden zonder enige zorg dat zich ook daar micro organismen bevinden
	Poep
Geluidsoverlast van verkeer	Geluidsoverlast van verkeer
	Vehicles
Niets	Niets
Geen	Auto’s
Afval	Afval
	Hondenpoep
Processierups	Hooikoorts
Geen	Hondenpoephondepoep
Geen	Snelweg
Auto's	Uitwerpselen van dieren
Geen	Zwerfvuil en hondepoep
Geen	Hondenpoep& afval
Verkeer	Verkeer
Niet	Niet
Rommel	Rommel
Vogelpoep	Poep
	Drukte, vuil
Vogel poep	Dieren poep
	Afval
Zwerfafval	Zwerfafval
Poep	Poep
	Hondenpoep
Geluid van verkeer	Geluid van verkeer
Too much traffic	Too much traffic

Q20	Q21
	Dieren poep
	De dieren
Afval, stank van auto's, te veel mensen	Afval, geluid en stank van auto's
Zwervers	Zwervers
Afval	Geen
Drukke paden	
N.v.t.	N.v.t.
Aanwezigheid anderen in combinatie met smalle paden	Weersomstandigheden. Regen/modder. Wind/kou
Drukte van de hoeveelheid mensen	Drukte van de hoeveelheid mensen
-	-
Weinig zitplek	-
Geluidsoverlast	
	geen
	Koeienpoep
Geen	Geen
Gb	Hondenpoep
Hondenpoep	
Geen	Geen
Mensen die denken dat het park voor hen alleen is en afval	Afval
Ontbreken van prullenbak	
Geen	Slecht onderhouden
Toeristen	Hondenpoep
Zwerfafval	
?	Afval. Roken
Troep	Geen
Veel toerisme	Verkeer
	Te veel mensen
	Poep
"Hangende mensen/groepen"	
Lawaai overlast	Loslopende koeien etc
Zwerfvuil	Zwerfvuil
Drukte	Dieren
Geen	Geen
Afval	
Drukte en te klein	Hooikoorts
Afval	Afval
Schreeuwers	
	Poep
Lawaai	Dier uitwerpselen
Geluidsoverlast van verkeer	Geluidsoverlast van verkeer
Loud children	Bugs
Aantal mensen op klein gebied	Wind
Te veel mensen	Geen
Afval	Afval
Duivenpoep	
Nvt	Pollen
Hondepoep	Geen
Autoweg	Auto
	Uitwerpselen van dieren
Lawaai	Nvt
Mensen die zich a-sociaal gedragen	Afval en hondenpoep
Drukte	Geen
Niet	Afval
	Rommel
	Poep
Drukte, vuil	Te nat, dus dikke plassen
Muziek	
Te veel mensen	
Te veel mensen	
Drank en drugs misbruik	Zwerfafval
Slechte begaanbaarheid	
Drukte	
Noise from people	Animal dumps

8.3 Appendix 3 – SPSS Results

Statistics

		social interaction 1	social interaction 2	social interaction 3	physical health 1	physical health 2	physical health 3	mental health 1	mental health 2	mental health 3
N	Valid	95	95	95	95	95	95	95	95	95
	Missing	10	10	10	10	10	10	10	10	10

Figure 17: Frequency table of Likert scale responses

social interaction 1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	2	1,9	2,1	2,1
	disagree	2	1,9	2,1	4,2
	neutral	15	14,3	15,8	20,0
	agree	54	51,4	56,8	76,8
	strongly agree	22	21,0	23,2	100,0
	Total	95	90,5	100,0	
Missing	System	10	9,5		
Total		105	100,0		

Figure 18: Frequency table of social interaction statement 1, created with SPSS

social interaction 2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	1	1,0	1,1	1,1
	disagree	8	7,6	8,4	9,5
	neutral	25	23,8	26,3	35,8
	agree	43	41,0	45,3	81,1
	strongly agree	18	17,1	18,9	100,0
	Total	95	90,5	100,0	
Missing	System	10	9,5		
Total		105	100,0		

Figure 19: Frequency table of social interaction statement 2, created with SPSS

social interaction 3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	1	1,0	1,1	1,1
	disagree	4	3,8	4,2	5,3
	neutral	23	21,9	24,2	29,5
	agree	56	53,3	58,9	88,4
	strongly agree	11	10,5	11,6	100,0
	Total	95	90,5	100,0	
Missing	System	10	9,5		
Total		105	100,0		

Figure 20: Frequency table of social interaction statement 3, created with SPSS

physical health 1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	disagree	3	2,9	3,2	3,2
	neutral	10	9,5	10,5	13,7
	agree	54	51,4	56,8	70,5
	strongly agree	28	26,7	29,5	100,0
	Total	95	90,5	100,0	
Missing	System	10	9,5		
Total		105	100,0		

Figure 21: Frequency table of physical health statement 1, created with SPSS

physical health 2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	2	1,9	2,1	2,1
	disagree	9	8,6	9,5	11,6
	neutral	8	7,6	8,4	20,0
	agree	42	40,0	44,2	64,2
	strongly agree	34	32,4	35,8	100,0
	Total	95	90,5	100,0	
Missing	System	10	9,5		
Total		105	100,0		

Figure 22: Frequency table of physical health statement 2, created with SPSS

physical health 3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	1	1,0	1,1	1,1
	neutral	6	5,7	6,3	7,4
	agree	51	48,6	53,7	61,1
	strongly agree	37	35,2	38,9	100,0
	Total	95	90,5	100,0	
Missing	System	10	9,5		
Total		105	100,0		

Figure 23: Frequency table of physical health statement 3, created with SPSS

mental health 1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	1	1,0	1,1	1,1
	disagree	1	1,0	1,1	2,1
	neutral	5	4,8	5,3	7,4
	agree	49	46,7	51,6	58,9
	strongly agree	39	37,1	41,1	100,0
	Total	95	90,5	100,0	
Missing	System	10	9,5		
Total		105	100,0		

Figure 24: Frequency table of mental health statement 1, created with SPSS

mental health 2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	disagree	5	4,8	5,3	5,3
	neutral	33	31,4	34,7	40,0
	agree	42	40,0	44,2	84,2
	strongly agree	15	14,3	15,8	100,0
	Total	95	90,5	100,0	
Missing	System	10	9,5		
Total		105	100,0		

Figure 25: Frequency table of mental health statement 2, created with SPSS

mental health 3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	neutral	3	2,9	3,2	3,2
	agree	54	51,4	56,8	60,0
	strongly agree	38	36,2	40,0	100,0
	Total	95	90,5	100,0	
Missing	System	10	9,5		
Total		105	100,0		

Figure 26: Frequency table of mental health statement 3, created with SPSS

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
social interaction 1	95	1	5	3,97	,818
social interaction 2	95	1	5	3,73	,904
social interaction 3	95	1	5	3,76	,754
physical health 1	95	2	5	4,13	,718
physical health 2	95	1	5	4,02	1,010
physical health 3	95	1	5	4,29	,682
mental health 1	95	1	5	4,31	,716
mental health 2	95	2	5	3,71	,797
mental health 3	95	3	5	4,37	,547
Valid N (listwise)	95				

Figure 27: Descriptive Statistics of Likert scale statements

8.4 Appendix 4 – Nuisances in Each Type of Urban Green

Which nuisance(s) in parks do you find most discouraging?

Type of nuisance	**Number of responses**
Litter Not enough trash disposals	21
Overcrowding / too many people	19
Animal droppings	17
Noise nuisance Loud music	6 5
Traffic Noise and smell from traffic	5 4
Unleashed dogs Pets Dog walking areas	6 1 1
Homeless people	4
Drunk people Drug dealers Alcohol and drug use Aggressive behaviour under the influence of alcohol and/or drugs Aggressive behaviour	2 1 1 1 1
Loitering	2
Unsavoury types	1
Barbeques	1
Not enough seating	1
People who smoke	1
Feeling of unsafety	1

Which nuisance(s) in forests do you find discouraging?

Litter	16
Overcrowding / too many people	13
Unleashed dogs	7
Animals	1
Ticks	4
Bugs	1
Traffic	4
Nearby roads	3
Noise and smell nuisance from traffic	1
Noise nuisance from traffic	2
Noise nuisance	2
Loud music	2
Loud people	1
Animal droppings	3
Filth	2
Mud	1
Puddles	1
Dense forestation – dark: creating a feeling of unsafety	1
Unsafe for women alone	1
Small forest	1
Walking in restricted areas	1
Unsavoury types	1
Asphalt	1
Limitations	1
Hay fever	1

Which nuisance(s) in (near road) trees do you find discouraging?

Litter	9
Traffic	9
Noise and smell nuisance from traffic	1
Noise nuisance from traffic	1
Traffic safety	1
People who drive (too) fast	1
Driving lessons cars	1
Too much traffic	3
Animal droppings	7
Overcrowding / too many people	3
Risk of collisions	2
Homeless people	1
Noise nuisance from trees	1
No seating	1
Processional caterpillar	1

Which nuisance(s) in (near road) grass do you find discouraging?

Animal droppings	15
Litter	13
Traffic Noise and smell nuisance from traffic Noise nuisance from traffic Traffic safety Too much traffic Roads	9 1 4 1 3 2
Hay fever	2
Homeless people	1
Unleashed dogs	1
Overcrowding / too many people	1
Wind	1
Poor maintenance	1
People driving over the grass with no regard for the microorganisms that are present there	1
Filth	1

Which nuisance(s) in public gardens do you find discouraging?

Overcrowding, too many people	12
Litter No garbage disposals	9
Noise nuisance Music Loud people	5 1 2
Noise nuisance from traffic Smell nuisance from traffic Traffic Roads	1 1 1 1
Animal droppings	3
People who disregard their environment	2
Tourists	2
Too small Narrow paths	2 1
Limited seating	1
Large groups hanging around	1
Alcohol and drug misuse	1
Homeless people	1
Poorly accessible	1

Which nuisance(s) in grasslands do you find discouraging?

Animal droppings	11
Litter	10
Animals Cows that run loose Bugs	2 1 1
Traffic Noise and smell nuisance from traffic Noise nuisance from traffic	2 1 1
Weather (rain, mud, wind, cold) Wet, puddles	2 1
Overcrowding / too many people	2
Poor maintenance	1
Smoking	1
Hay fever Pollen	1 1

8.5 Appendix 5 – Peer Review Form

Peer review by Tess ten Have

General		**What was done?**
Is the thesis clearly structured?	Overall, the text has a good structure. However, by using subtitles the author could make the structure clearer. Also, I would advise to number the chapters and subtitles, which will make it easier to refer to other parts of the thesis.	Subtitles have been added and both the chapters and the subtitles have been numbered.
Is there a clear link between the different parts?	There is a clear link between the parts. Before starting with summarizing the results, the author mentions what the 'section' will discuss. It would be good to also do the same for the other chapters.	A summary has been added to the chapters, only not to the introduction and theoretical framework. I am not sure if it is necessary to add there, but it can be added later still.
Are the majority of the sources of an academic nature? If not, is there a good reason for this?	Most of the sources are of academic nature. The sources that are not of academic nature are mainly used for photos or figures, so there is a good reason for using the sources.	
Is the literature of a recent date? If not, is there a good reason for this?	There are not many academic sources dated after 2015 (three to be exact). While 2015 is fairly recent, it would make the necessity of the research stronger if the author could find some more recent sources (e.g., dated up to five years back.) The only source dated from before 2000 is from the WHO and there is a good reason to have done so.	Some more recent sources have been added to the thesis.
Are all the sources used included in the references?	All sources are included in the reference list.	
Are the sources correctly cited in the body of the text?	The sources are correctly cited in the body of the text. However, when referencing multiple papers in one sentence, the author may write it as follows: (Tzoulas et al., 2007; De Vries et al., 2003; Wolf et al., 2020) as, for example, in the last sentence on page 19.	This has been applied to the referencing in the text.
Are the sources correctly referred to in the reference list, in accordance with the Harvard system?	The sources are correctly referred to in the reference list. The author should make sure to be consistent in putting a '.' behind the year of publication and a ':' behind 'from' when referencing to a website.	The references were checked and corrected where the '.' and ':' were missing.
Do the figures and tables clarify the text?	Overall, the figures and tables clarify the text well. The author could use several colors in the pie chart on page 11, since the different shades of green are much alike.	The figure has been changed to make it easier to read. However, I prefer the original one where the colours match the other

		figures. Depending on the feedback of the supervisor this change might be undone.
Are the figures and tables numbered correctly and are they referred to in the text?	The author should refer to figures 8 till 13 as 'tables' since they are not figures. Figures 8 till 11 are not referred to in the text. The author may think about changing the sentence underneath the figures to: 'From figure 8, the following ranking can be derived:' and so forth.	Figures 8 to 13 are now tables and are referred to in the text.
Is the text clear and readable?	While the text is clear, especially the Theoretical Framework and the Results feel like an enumeration of papers/data. It would make the text more readable if the author could bring more narrative into the text. Using subtitles could slightly help with that.	Subtitles have been added and I have tried to add more narrative into the text.
What is the sentence structure like?	The sentence structure is good. The sentences are not too long and are well comprehensible.	
Are the spelling, grammar and punctuation correct?	While the grammar is not bad, it is recommended to use Grammarly.com to check the thesis when it is completely finished, especially for some punctuation corrections.	Grammarly was used to check the grammar.
Questions/Comments		

Summary		**What was done?**
Are the main aspects of the study discussed?	Yes, the summary mentions the relevance, aim, research question, methods, and main results.	
Are the topic, aim, research questions, methods, results and conclusions summarized?	See above. While the author mentions that 'various nuisances' were found, it would be interesting to also mention what these nuisances were that according to the research were the most important (e.g., litter and animal droppings). Also, since the author did not perform a correlation analysis or something similar, it should not be stated that the data 'shows a positive relationship between urban green	The nuisances found in the results have been added to the summary and the sentence about a positive relation has been changed to: "The data shows that urban green has a positive effect on the wellbeing of Groningen city dwellers."

	and well-being'. Therefore, consider leaving out that sentence from the summary.	
Questions/Comments		

Introduction		
Is the topic clearly defined?	The topic is fairly clearly defined. However, in the first paragraph the author makes three strong statements about the impact of green on climate change, wellbeing, and about decreasing green space. The author should try to find a few references to back up these statements. The statements may seem obvious but adding 2 or 3 sources would make them stronger and it's academic to do so. In addition, in the third paragraph the author mentions some previous papers on urban green and well-being. It would be interesting to shortly mention the results of these studies as well. Then the author can eventually reflect on the results of the primary data to see if they are in line with previous findings.	The statements made have been backed up by literature that was already used in the thesis and also by new literature. The results of the studies are briefly mentioned.
Is the relevance of the topic clearly explained?	The relevance as mentioned by the author is the increasing pressure on existing green space/ the decreasing urban green space, but this is not backed up by any sources. Building new houses does not necessarily mean a decrease in urban green. The author should try to explain why it is needed to make a case for including 'more' urban green in spatial planning. Is there not enough green space now, or are there no sufficient policies on sustaining urban green?	This study doesn't aim to include more urban green, but it aims to stress the importance of urban green to ensure that it is included in spatial planning, now that the urban environment is increasing. I misstated this myself and I have changed the sentence in question.
In your own words, what is the purpose of the research?	The purpose of the research is to confirm the positive effects of urban green on well-being for Groningen, in order to put a focus on the importance of maintaining urban green in spatial planning.	
Are the aim and research questions integrated into the academic literature?	The aim and questions are integrated into the academic literature. The author also mentions that the hypothesis is based on the findings of various studies, but only	In theory, all the literature read for this thesis has influenced the hypotheses made, however, I have now

	mentions one source. Try to mention all papers that the hypothesis is based on as a source.	included the most relevant sources that were used to make the hypotheses.
Does the Introduction arouse your interest? If so, how? If not, why not?	The topic is interesting; however, the author could arouse interest more if the relevance of the research is explained better. For example, the author could mention some figures about how few urban green space is left in cities, which would make clear why the research is so important.	As explained, this thesis does not necessarily aim to include more urban green. It aims to stress its importance. Based on both the existing data on environmental benefits and the data on wellbeing it is made evident that urban green plays an important role in a city's health and should therefore not be ignored.
Questions/Comments		

Theoretical framework		
Do the theoretical insights that are discussed constitute a relevant basis for answering the research question(s)?	Yes, the author has included many relevant theoretical insights. However, since the Theoretical Framework is used to answer two of the sub-questions, the author should try to elaborate more on the different studies that the definitions are based upon. The author could mention the different definitions used in other papers and what the similarities and differences are between the definitions that were used in them. Then the author can mention the chosen definitions and explain why it has been decided to use these definitions of 'urban green' and 'wellbeing'.	More information has been provided in regards to the definitions that were given in the theoretical framework.
Are the theoretical insights explained in a comprehensible way?	As mentioned before, the chapter feels a bit like an enumeration of studies. It is good that the author mentions so many different sources, but it is a bit hard to read. Subheadings would help bring more structure/line in the text. The author should try to give it more narrative.	Subtitles have been added and I have tried to give the theoretical framework more narrative to make it easier to read.
Are there references to relevant international academic literature? (articles from academic journals and books)	Yes, many relevant and international academic sources have been used, such as the journal of '*Landscape and Urban Planning' and* '*International Journal of Environmental Research and Public Health'.*	

Is the theoretical framework logically structured?	Yes, the structure of the text is good. Again, subtitles would make it better.	Subtitles have been added.
Does the conceptual model tie in with the research questions and theory?	The conceptual model is very good. It gives a clear and simple representation of the concepts and the relationship between them.	
Questions/Comments		

Methodology		
Is the choice of data collection and data analysis methods well explained?	In the methodology, the author should first elaborate on the choice of case study. Why did the author use a case study and why was Groningen chosen? What are the geographical borders of the case study? The secondary and primary data collection is explained well.	The choice of the case study has been elaborated in the methodology. If the supervisor finds that this section is better suited for the data reflection in the discussion, this can be changed.
Do the data collection and data analysis methods match the aim and research questions?	Yes, the data collection and analysis match the aim and research questions. Creating a figure/table that shows which questions are answered by which methods can make this clear quickly.	Figures 2-4 have been added to show more clearly how the research questions were answered. The research questions that were answered through the secondary data were not included as this was pretty straightforward. This can be added if needed.
Are the questionnaires, observation checklist, etc. included in the appendices?	Yes, the questionnaire has been added to the appendix.	
Does the author clearly explain how he/she set about collecting and analyzing the data?	The data collection is explained well. When explaining the data analysis, the author mentions that the mean is used to analyze the Likert scale data. It is not possible to use the 'mean' for ordinal data. However, Likert scale responses are often treated as ratio data, so that the mean can still be used. If the author wants to do this, it should be elaborated in the methodology why the author chose to treat the ordinal	I can only find information on treating Likert-scale data as interval data, so I suppose this is what the reviewer meant. The information that I have found explains that Likert-scale data can be used as interval in order to do statistical tests. I have discussed doing statistical tests with professor

	variables as ratio, and why the data is suitable to do so.	Venhorst and we agreed that my data was not suitable. I will leave this issue alone for now and wish to discuss it with the supervisor in the individual meeting, if possible.
Is there a reflection on the quality of the data that was collected?	Yes, the author already reflects on the missing values in the methodology and mentions the limitations to self-reported data.	
Is there a satisfactory explanation of the ethical considerations relevant to the research and of how these were dealt with?	Yes, the confidentiality and anonymity of the survey are explained and how the data is used.	
Are the Methodology sections logically structured?	The use of subtitles in this part makes the structure very clear. However, in the text about the Primary Data Collection, what the survey is like and how it is distributed is a bit mixed up.	Primary data has been divided into 'data collection' and 'data analysis' to give this chapter some more structure.
Questions/Comments		
In the methodology the author could maybe already explain the Likert-scale grading system of Sullivan & Artino (2013), as is mentioned later in the results. Also, the author can explain that the definition of 'urban green' in the survey has been clarified by using photos. I think that is a very strong point of the survey.		The Likert-scale grading system is now shortly introduced in the methodology, but the main explanation remains in the secondary data results (as that is what it is), but this can be changed if needed. The use of pictures to provide the respondents with a definition of the type of urban green has been elaborated in the primary data collection.

Results		
Are the most relevant results discussed?	Yes, the most relevant results are discussed.	
Are the results thoroughly analyzed (i.e. not just described)?	On page 13 and 14 the descriptive statistics generated through SPSS are shown, but there is no reflection on them. The author could elaborate on what the mode, median, and mean say about the responses and	I am not sure what the reviewer means with elaborating on the mode, median and mean, because I would assume that there is no need to explain the

	whether these outcomes are in line with what was expected. This also counts for the rankings shown on page 14 and 15, the author could already elaborate on, for example, the differences in the rankings and why this may be. The analysis of the open-ended questions on page 17 is well done. In the overall results is elaborated a bit more on the findings, however, it would be good to mention this right after the descriptives are shown and reflect a bit more on what can be seen.	definitions of these concepts in an academic article. It is already explained in section 6.2 whether the data was in line with what was expected. I prefer reading the text like it is, with the explanation of the overall results separate from all the tables and figures I find it easier to read. If the supervisor also prefers the way of the reviewer I can change it.
Are the results linked to the research questions?	Yes, mentioning the results per question that is answered makes it clear how these are linked.	
Are the results sections logically structured?	As mentioned before, the reflection that is stated in the overall results could be shown per section it describes. That might make immediately clear what these results actually say and how it answers the questions.	See 'are the results thoroughly analyzed?' for my explanation.
Questions/Comments		
I had to read the part about the ranking on page 14 a few times before I understood the 'points system', maybe the author can elaborate on this a bit more here or in the methodology.		The point system is explained in the methodology and then shortly explained again in the results.

Conclusion/discussion		
Are the research questions answered?	Yes, it is clear that the answers are given per sub question.	
Are the results placed in a broader theoretical perspective?	Yes, the results are placed in a broader theoretical perspective by reflecting on other papers. However, the author should watch that no new information is given in the conclusion. The results of the study by Payne et al. have not been mentioned before the conclusion. The author should refer to papers that have been discussed in the introduction or theoretical framework.	The study has been moved to the theoretical framework and is then linked back to in the conclusion.

Are the results compared with other research results?	Yes, in the conclusion the results are compared to other papers. While under question four the author states that litter and overcrowding were not mentioned in previous research, it is not mentioned where this difference may come from. It could be interesting to provide a possible explanation.	I could not find why that specific research does not mention the same nuisances as my respondents do. I can look into other literature if necessary.
Are there recommendations for future research?	Yes, recommendations for future research have been given at the end of the conclusion. The recommendations make clear how further research can avoid the limitations that the data of this research has and suggests research based on the outcomes of the results of this research.	
Questions/Comments		
The author can think about dividing the conclusion into 'conclusion' and 'discussion'. In the 'discussion', the author can also add a part in which is reflected on how the data collection went. Were all the questions in the survey useful? In hindsight, were there other questions that should have been added? How did the data collection go? Is the number of respondents sufficient?		A 'discussion' chapter has been added in which the data collection is reflected upon and the future research section has been moved from conclusion to discussion.

Based on:
Pain, R. & G. Mowl (1996) Improving geography essay writing using innovative assessment. *Journal of Geography in Higher Education* 20(1): 19-32.

Kennedy-Kalafatis, S. (1996) Encouraging peer dialogue in the geography classroom: Peer editing to improve student writing. *Journal of Geography in Higher Education* 20(3): 323-341.