Perception of neighborhood quality and the role of urban green spaces

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Abstract

Residential location preferences is a well researched topic, it is widely known that there are many factors that can influence where people decide they want to live. Many of these factors can be grouped together under the name neighborhood quality. However, since most literature focuses on only one of these factors, their relative importance is not very clear. This research includes six of the most important factors for determining neighborhood quality and aims to find out to what extent the existence of urban green spaces influences people's perception of the quality of the neighborhood, compared to the other influential factors. In order to do this, two neighborhoods in the city of Groningen were chosen based on the amount of green space per person in the neighborhood. The Florabuurt with a very high amount of green space per person, and the Rivierenbuurt with a very low amount of green space per person. A quantitative analysis in the form of surveying followed by statistical analysis was performed in order to find out which factors are most important in determining neighborhood quality in these two neighborhoods. The role of safety, housing, and green spaces were ranked as most important in both neighborhoods, followed by the role of amenities and infrastructure. The role of community feeling ranked lowest in both neighborhoods, meaning that the respondents (n=77) do not think that community feeling, or social cohesion, is that important in determining the quality of their neighborhood. Multiple linear regression was used to assess the relationship between the independent variable neighborhood score and the six independent variables. For instance, in the Rivierenbuurt there is a small positive relation between amenities and neighborhood score. Meaning that a higher score for the importance of amenities will lead to a higher neighborhood score. Aside from that, no clear relationship was observed between neighborhood score on the one hand and the six independent factors on the other hand. A possible explanation for this could be that residents and potential residents view neighborhoods as cohesive entities, rather than a combination of independent variables. Further research is needed with a larger case study and sample size in order to better understand the relationship between neighborhood quality and the independent variables.

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1. Introduction

1.1 Background and relevance

Many different factors might play a role when people decide where they want to live, a lot of these factors can be put together under the name neighborhood quality. People's perception of the quality of a neighborhood is thus dependent on different components. The relative importance of these components can differ per person, but also per neighborhood.

Most studies on neighborhoods and quality focus on one specific factor, for instance housing (Collinson & Ganong, 2018; McClure & Johnson, 2015), or on the influence of the neighborhood on quality of life (Wechroth, 2022). As a result, there is a clear gap in the literature when it comes to completely and jointly researching the different factors influencing perceived neighborhood quality and their relative importance.

Therefore, in this thesis the key factors will be explored, with a main focus on the effect of urban green space on perceived quality of the neighborhood. Urban green space was chosen as a specific focus because in a world of climate change, increasing concerns for sustainability and air quality, the relevance of having green spaces in the living area is becoming more and more understood (Van den Berg et al., 2015), as a result of increasing research on the topic. However, green spaces are not often analyzed in combination with other factors that are responsible for influencing perceived neighborhood quality, and thus, there is no clear picture of their relative importance.

1.2 Objectives and research questions

The aim of this thesis is to examine the different factors that play a role in how people perceive the quality of a neighborhood, and to find out to what extent the existence of urban green space plays a role in this perception. In order to do this, a case study will be used consisting of two neighborhoods in the Dutch city of Groningen; the Rivierenbuurt and the Florabuurt.

Following this aim, the main research question that will be used is: 'To what extent does the existence of urban green spaces in two different neighborhoods in Groningen influence people's perception of the quality of the neighborhood, compared to other influential factors?' For the purpose of answering the main research question, multiple sub-questions will be used. The first sub-question is 'Which factors are most relevant in influencing the perception of neighborhood quality?'. This question will be answered using academic literature and will be the base of the theoretical framework.

The second sub-question is 'How does the amount and distribution of green spaces differ between the two researched neighborhoods?'. This question will be answered using secondary data and GIS, and will result in a map showing the green spaces in these neighborhoods. The secondary data consists of geographical data on land use in the Netherlands and is derived from the CBS.

The third and final sub-question is 'How do the residents of the two different neighborhoods perceive the importance of green spaces in forming their perception of the quality of the neighborhood?'. This question will be answered using a survey followed by statistical analysis. The primary data is collected among a total of 77 residents of the two researched neighborhoods. The primary data measures how residents perceive the importance of six factors in determining neighborhood quality, which makes it possible to compare the relative importance of the different factors.

1.3 Reading guide

This thesis consists of five chapters. In chapter two the main theories and concepts will be discussed, focusing on the main factors that determine neighborhood quality. Chapter three will explain the chosen research methods and the methods of data collection. The results of the data collection and analysis will be presented in chapter four. In the fifth chapter the main research question will be answered, followed by recommendations for further research.

2. Theoretical framework

In order to answer the first sub-question, the key factors influencing the perception of neighborhood quality will be discussed in this theoretical framework. Since perceived neighborhood quality is not a broadly researched topic, some literature used is focussed on quality of life instead. However, residential location, and thus neighborhood characteristics like these factors, have a significant impact on perceived quality of life (Wechroth et al., 2022; Riecken & Yavas, 2001). As a result, it can be concluded that when someones perceived quality of the neighborhood they live in is positive, this will also positively influence quality of life. Thus, for this research it is assumed that factors that positively influence perceived quality of life will also positively influence perceived neighborhood quality.

2.1 Amenities

The first factor that influences perceived neighborhood quality is amenities. Amenities are features in a neighborhood that are meant to make life more pleasant and convenient. Examples of amenities are shops, restaurants, and schools (Elldér et al., 2022). These amenities are often present on a neighborhood level. Other amenities, such as hospitals, sports stadiums, or music halls are more likely to be present on a city level, and thus less relevant for this theoretical framework. Since amenities are meant to make life in a neighborhood more pleasant and convenient, it is assumed that an increase in amenities will lead to an increased neighborhood quality.

2.2 Housing

Another factor that strongly influences perceived neighborhood quality is housing. Research has proven that there is a strong correlation between housing quality and perceived neighborhood quality (Greenberg & Crossney, 2007). Housing quality in this case can include, for instance, size of the house, maintenance of the house, location of the house, and costs of the house. The influence of the variables on neighborhood quality can differ strongly per person. However, in general it can be assumed that for most people, larger, more expensive, and well maintained houses will lead to an increase in neighborhood quality.

2.3 Infrastructure

In this theoretical framework infrastructure is defined as accessibility, both to and from the neighborhood as within the neighborhood, as well as the quality of the road network. A higher quality of the road network can be assumed to result in an increase in perceived neighborhood quality. Accessibility can have both positive and negative effects on perceived neighborhood quality. Several case studies have shown that neighborhood quality was improved after replacing highways with greenways and improved public transportation (Cervero, 2009). Thus, too much accessibility, for instance in the form of highways through or in very close proximity to the neighborhood can have negative effects on neighborhood quality. Regarding infrastructure, the goal should be to find a balance between mobility and liveability (Cervero, 2009). Therefore, the influence of infrastructure on neighborhood quality can be both positive and negative.

2.4 Safety

Being safe and feeling safe logically lead to an increased perception of quality of the neighborhood, however in this case this also works the other way around. Both neighborhood and housing quality are found to have a positive effect on feelings of safety (Austin et al., 2002). Crime is listed as one of the main reasons for a lower perceived feeling of safety, with the result of a lower perceived quality of the neighborhood (Greenberg et al., 1994).

2.5 Community feeling

Community feeling, also known as social cohesion or social integration, can be considered one of the most important factors for predicting perceived neighborhood quality. Positive relationships between neighbors lead to residents that are more likely to be satisfied with their neighborhood. More social cohesion can even decrease the effects of crime on perceived neighborhood quality (Dassopoulos et al., 2012). Relationships between residents can be negatively influenced by discrimination, segregation, and other social processes, which in turn can lead to a decrease in the perceived neighborhood quality.

2.6 Green spaces

The last factor that influences perceived neighborhood quality is urban green space. In this thesis green spaces are defined as follows; green spaces are public spaces that are outdoors, for example parks, plazas, or other open spaces of which the surface is primarily composed of vegetation and water (Wright Wendel et al., 2012). Following this definition, green spaces can have a large effect on the neighborhood quality, since green spaces can usually be found throughout the neighborhood. When looking at the effect of green space quantity, quality, and accessibility on wellbeing and quality of life, green space quantity seems to be the most significant determinant (Larson et al., 2016).
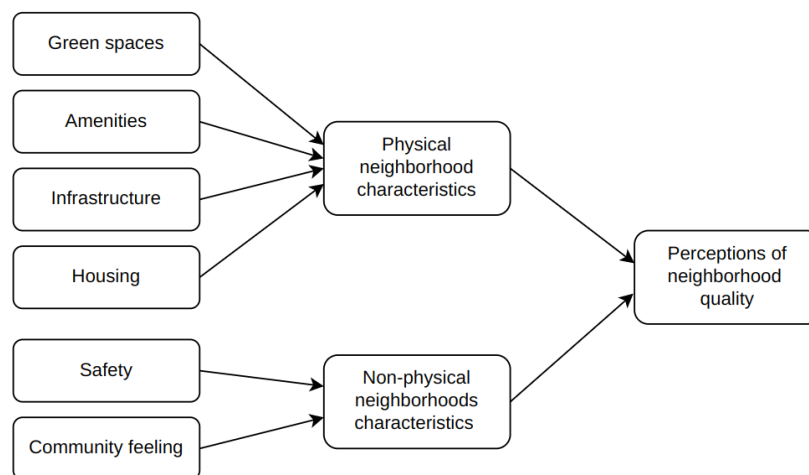
2.7 Conceptual model

Figure 1: Conceptual model

Figure 1 shows the conceptual model used in this thesis. On the left side are the main factors influencing the perception of neighborhood quality as described in the theoretical framework. These factors are divided into two categories, physical neighborhood characteristics and non-physical neighborhood characteristics. This division is inspired by Fattah et al. (2015), who, in their conceptual model on factors affecting neighborhood quality, divided the different factors into three categories; physical, social, and economic factors. However, since less factors are used in this thesis, using two categories is more suitable. The physical neighborhood characteristics and the non-physical neighborhood characteristics together form the perceptions of neighborhood quality.

2.8 Hypotheses

This research will have two general hypotheses and a null hypothesis for the statistical analysis

The first general hypothesis is:
There is a positive relationship between the quantity of green spaces and the perception of neighborhood quality. More green space is expected to lead to a more positive perception of neighborhood quality

The second general hypothesis is:
The influence of the existence of green spaces on the perception of neighborhood quality is smaller than the influence of other neighborhood characteristics

The null hypothesis for the multiple linear regression is:
In the population, there is no relationship between neighborhood score on the one hand and the role of green spaces, the role of amenities, the role of infrastructure, the role of housing, the role of safety, and the role of community feeling on the other hand.

3. Methodology

3.1 Overview of the empirical strategy

Based on the research question and the sub-questions the most suitable method of data collection was decided to be surveying. The survey will mainly be used to answer the third research sub-question, 'How do the residents of the two different neighborhoods perceive the importance of green spaces in forming their perception of the quality of the neighborhood?'. A survey is the most useful way of data collection for this question since it allows a relatively large number of respondents from both neighborhoods. With a small set of simple questions, it is possible to collect a large amount of useful data. This data can be used to perform statistical analysis. In the end, this analysis will show whether the existence of green spaces has a larger effect on the perceived neighborhood quality than the other researched factors.

The entire survey was made in Dutch, since it was assumed that most residents of the neighborhoods are most comfortable with answering questions in this language. The survey started with an introductory text to explain the goal of the survey and the research, followed by nine questions (Appendix 1). All questions had to be answered, participants could not skip any questions. The respondents were first asked to rate their neighborhood on a scale of 0 to 100. Thereafter, they were asked how large the role of the six different factors was for them, in determining the quality of their neighborhood, again on a scale of 0 to 100. Asking how large the role of the different factors is makes it possible to analyze their relative importance. All questions were answered on an interval scale of 0 to 100, which makes it possible to perform the statistical analysis. Table 1 shows the six key factors and their definition as given in the survey.

Table 1: Variable definitions

Variable	Definition given in survey
Role of green spaces	Green spaces include parks, lawns, trees, green playgrounds, flower beds and other vegetated areas.
Role of amenities	Amenities include shops, restaurants, schools and childcare.
Role of infrastructure	Infrastructure includes parking facilities, the quality of the road network and accessibility from the neighborhood (for example towards the center or out of the city).
Role of housing	Housing includes size of the houses, maintenance of the houses, location, costs and housing density.
Role of safety	Safety includes crime, but also factors such as street lighting or traffic.
Role of community feeling	Community feeling includes the mutual relationships between residents.

3.2 Study area selection

Before the surveys could be distributed, it had to be determined which two neighborhoods would be the focus of this research. An Excel analysis was performed using data from the CBS from 2017, the most recent year for which all data was complete (CBS, 2020; CBS, 2022). For all 108 neighborhoods in the municipality of Groningen the total size of parks in hectares, and the number of inhabitants was collected from the CBS.

The two conditions for neighborhoods to be included in the analysis were that they had to have at least 1,000 inhabitants, and at least 1 hectare of green space. The condition for the number of inhabitants has to do with the possibility of getting enough respondents. The smaller the number of inhabitants in a neighborhood, the harder it would be to find respondents. Therefore, the threshold was decided to be 1,000 inhabitants or more. The condition of at least 1 hectare of green space has to do with the nature of the data. The CBS data on green spaces per neighborhood was rounded to whole hectares, as a result, many neighborhoods had zero hectares of green space. Since the aim of the research is to measure the effect of green spaces on the perception of neighborhood quality, it was more suitable to select only the neighborhoods that had green spaces in the data.

The data of the remaining neighborhoods was used to calculate the area of green space per person for each of the neighborhoods (appendix 2). The two chosen neighborhoods are on opposite sides of the distribution, the Florabuurt has a very high amount of green space per inhabitant, and the Rivierenbuurt has a very low amount of green space per inhabitant.

3.3 Data collection and description

The survey is conducted among residents of the two chosen neighborhoods in Groningen. Participants for the survey were first recruited by sharing the link to the survey in over ten Facebook groups, since this is the most accessible way to reach large numbers of people at once. In case this ensured enough participants, this would be the only way of recruiting participants. In this case unfortunately the Facebook groups did not ensure enough participation. Therefore, flyers with a qr code and a short explanation were printed and put in mailboxes across the neighborhoods.

A total number of 360 flyers were distributed over the two neighborhoods, leading to a total of 77 responses. Participants can be anyone who lives in one of the researched neighborhoods. It is not a problem when multiple people from the same household participate, since perception of neighborhood quality is very subjective and differs per person.

The survey was made and filled out through Google forms. Since people could fill out the survey online and in their own time, it was not necessary to set a specific date or location for the data collection. After giving all possible respondents some time to submit their answers, the forms were closed and the data was exported to an Excel spreadsheet. Thereafter, the data was transferred into an SPSS dataset to allow for statistical analysis.

The 77 collected responses led to the following statistics on gender and age; from the Rivierenbuurt, 43.6 percent of the respondents identified as male, and 56.4 percent identified as female. From the Florabuurt 31.6 percent of the respondents identified as male, 65.8 percent as female, and 2.6 percent answered other/ would rather not say. There is quite a lot of variation in the respondents' ages. In the Rivierenbuurt the largest category is 18-30 years old, with 30.8 percent of the respondents falling in this group, followed by 31-40 years old (25.6 percent) and older than 60 years (20.5 percent). In the Florabuurt the age categories are a little less evenly

distributed. The largest category of respondents is between 31 and 40 years old (42.1 percent), followed by 26.3 percent of the respondents who are between 41 and 50 years old.

3.4 Statistical analysis

The statistical test that best fitted the collected data is the multiple linear regression. This test was most suitable since there is one dependent variable, the score respondents gave to their neighborhood, and multiple independent variables, the six factors from the theoretical framework that proved to be the most important factors in determining the neighborhood quality. All variables are measured at an interval level, a scale of 0 to 100. Although multiple linear regression is more often performed with data on a ratio level, the model is expected to still be useful for better understanding the relationships between the dependent and independent variables.

The specification of the model is expressed as:

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \beta_6 x_6 + \varepsilon$$

Where y is the dependent variable neighborhood score, β_0 is the intercept, $\beta_1,..., \beta_6$ are the regression coefficients for $x_1,..., x_6$, the six independent variables, ε is the residual error.

3.5 Ethics

By not analyzing the researcher's own neighborhood, the influence of positionality was avoided as much as possible, and the research was done from a neutral perspective. Privacy was guaranteed by asking for as little personal information as possible in the survey. Additionally, in the introductory text of the survey the respondents were informed about the goal of the research, to make it clear what they were participating in. The respondents were also reminded that they could decide to quit the research at any moment. The research does not focus on social stereotypes, or other specific population groups, all participation was and will be voluntary. The introductory text of the survey included the researcher's email address, and informed the participants that they could reach out with questions, or when they decided to withdraw their participation from the study.

3.6 Data quality

The research uses both primary and secondary data. All secondary data was retrieved from the CBS, which is a known and reliable organization. The primary data collected through the survey was made as reliable as possible. Naturally, all respondents had to answer the same questions. Respondents could only fill out the survey once, therefore, there are no duplicates in the data. The sample consists of 77 cases, this is enough to do statistical analysis, however, a larger sample size would make the study more representative to the population. Even though it was made as clear as possible who the survey was meant for, there is a possibility that people from other neighborhoods have filled in the survey. This is a disadvantage of distributing a survey partly online and can make the data less trustworthy.

4. Results

4.1 Study area analysis

The second research sub-question is 'How does the amount and distribution of green spaces differ between the two researched neighborhoods?'. Based on an analysis of the number of inhabitants and the amount of green spaces of all neighborhoods in Groningen (appendix 2) the Rivierenbuurt and the Florabuurt were selected for further analysis. The total amount of green spaces in the Rivierenbuurt is one hectare, and the total amount of green spaces in the Florabuurt is 8 hectares. The amount of green per inhabitant is 0.22 and 6.81 for the Rivierenbuurt and Florabuurt respectively.

In order to further answer this research question, secondary data was collected from the CBS to make a map of the green spaces in the neighborhoods (figure 2). The dark blue area on the map is the Rivierenbuurt, the red area is the Florabuurt, and the green areas are the green spaces. The map clearly shows how the Rivierenbuurt only has one little green area, while the Florabuurt has a large park along almost the entire neighborhood.
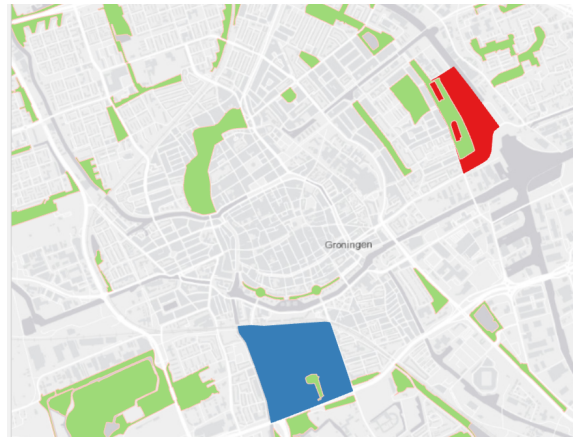
Figure 2: Location of the neighborhoods and distribution of green space

4.2 Descriptive analysis

The third sub-question is 'How do the residents of the two different neighborhoods perceive the importance of green spaces in forming their perception of the quality of the neighborhood?'. The survey that was conducted for this research question resulted in a total of 77 responses, 38 from the Florabuurt, and 39 from the Rivierenbuurt.

The mean for the neighborhood score for the Rivierenbuurt is 77.18, with a standard deviation of 9.99 (table 2). The mean neighborhood score for the Florabuurt is 81.18, with a standard deviation of 6.20 (table 2). Thus the respondents from the Florabuurt on average rated their neighborhood higher, and the lower standard deviation also means that there is less variability in their answers.

Table 2: Descriptive statistics

Variable	Rivierenbuurt (n=39)		Florabuurt (n=38)	
	Mean	Std. Dev.	Mean	Std. Dev.
Neighborhood score	77.18	9.99	81.18	6.20
Role of green spaces	78.46	19.40	85.00	11.57
Role of amenities	72.31	18.38	74.87	13.02
Role of infrastructure	73.46	22.54	70.53	18.88
Role of housing	79.10	17.32	76.45	16.27
Role of safety	80.51	18.70	82.11	13.39
Role of community feeling	67.18	20.93	66.18	19.29

The survey questions on the role of the six key factors resulted in a ranking of the relative importance of the factors based on the mean (table 2). For the Rivierenbuurt, the role of safety is considered as most important, with a mean of 80.51 out of 100. Followed by the role of housing, with a mean of 79.10 and the role of green spaces, which received 78.46 points on average. Least important is the role of community feeling. This is unexpected since literature described social cohesion as one of the most important factors for predicting perceived neighborhood quality. The role of community feeling does have one of the highest standard deviations, which means there was a lot of variability in the answers. Each response was, on average, 20.93 away from the mean of 67.18. It is notable that each of the six factors has a relatively high standard deviation, this shows how each of these variables are experienced and interpreted differently per person. These results are visualized with the use of trendlines in figure 3. The lighter coloured lines in the background show the number of responses for each score, for the six variables. The bright coloured lines show the trendlines. It is clearly visible that the variables with the highest means; safety, housing, and green spaces, have the steepest trendlines. The role of community feeling has a much lower mean, and therefore a flatter trendline.

While the role of safety is considered most important by the residents from the Rivierenbuurt, the role of green spaces is considered most important by the respondents from the Florabuurt, with a mean of 85.00 (table 2). This shows that green spaces are considered more important in determining neighborhood quality in the neighborhood with more green per person, the Florabuurt. Not only is the role of green spaces the most important factor in the Florabuurt, while it is in third place in the Rivierenbuurt, the mean for the role of green spaces in the Florabuurt is higher than any mean for the Rivierenbuurt. This shows that the people who live in the relatively green neighborhood find green spaces more important, and for them it has a larger influence on the quality of their neighborhood.

The second most important factor in the Florabuurt is the role of safety, with a mean of 82.11, followed by the role of housing, which has a mean of 76.45. Thus, the three most important factors are green spaces, housing, and safety in both neighborhoods. For the Florabuurt the

role of community feeling has turned out to be least important, just like in the Rivierenbuurt. The mean for community feeling is 66.18, which is almost identical to the mean for community feeling in the Rivierenbuurt, which is 67.18. Another thing that is notable from these results is that the standard deviation for the Florabuurt is lower for each variable, this means that the respondents from the Florabuurt are more unanimous in their answers, leading to less variability.

Figure 4 visualizes the results for the Florabuurt with the use of trendlines. It is clear that the trendlines in this figure are less clustered compared to figure 3, this shows that the means for the variables in the Florabuurt are further apart. In other words, the residents from the Florabuurt, on average, noted larger differences between the scores they gave different variables.
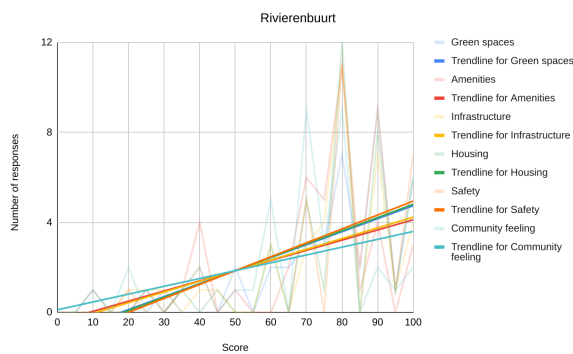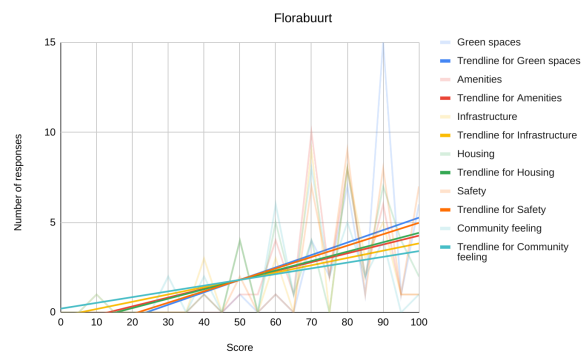

Figure 3: Trendlines for the Rivierenbuurt

Figure 4: Trendlines for the Florabuurt

4.3 Results multiple linear regression

The multiple linear regression was performed for both neighborhoods. The ANOVA table for the regression analysis with the data from the Rivierenbuurt shows a significance at the 5% level (table 3). This means that the model is just on the edge of significance. However, while the regression model is significant, this can not be said about most independent variables. The only variable that gives a significant result at the 5% level in the Coefficients table is the role of amenities (table 4), with a significance of 0.019 . The role of infrastructure shows a significance at the 10% level. The coefficients for both the role of amenities and the role of infrastructure have positive signs, this means that an increase in the role of amenities or infrastructure leads to an increase in the neighborhood score. The remaining four variables have significance scores between 0.136 and 0.917. Therefore, with this model it is difficult to get a better understanding of the relationship between the dependent variable neighborhood score and the independent variables. The VIF values in this model do not prove high multicollinearity.[1]

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[1] Looking at the multicollinearity statistics, the role of housing and the role of safety have the highest VIF scores; 2,280 and 2,846 respectively. However, in general a VIF score of 10 or higher is considered to show high multicollinearity.

Table 3: ANOVA table Rivierenbuurt

Model		Sum of squares	df	Mean square	F
1	Regression	1,177.677	6	196.280	2.405*
	Residual	2,612.066	32	81.627	
	Total	3,789.744	38		

Notes: Dependent variable: neighborhood score. Predictors: (Constant), Role of community feeling, Role of infrastructure, Role of amenities, Role of housing, Role of green spaces, Role of safety. * Significance at 5%.

Table 4: Coefficients table Rivierenbuurt

		Unstandardized Coefficients		Standardized Coefficients
Model		B	Std. Error	Beta
1	(Constant)	77.500***	8.175	
	Role of green spaces	-.010	.096	-.020
	Role of amenities	.252**	.102	.464**
	Role of infrastructure	.164*	.088	.371*
	Role of housing	-.184	.128	-.318
	Role of safety	-.202	.132	-.378
	Role of community feeling	.014	.077	.029

Notes: Dependent variable: neighborhood score. *, **, *** Significance at 10%, 5%, and 1%, respectively.

The regression model with the data from the Florabuurt gives a significance of 0.717, which is very clearly not significant (table 5). The same goes for the independent variables separately. The variable that is closest to significance is the role of safety, with a score of 0.281 (table 6). The variables with the highest scores are the role of amenities and the role of community feeling, both having a significance score of 0.870. As a result, it is again difficult to get a better understanding of the relationship between the dependent variable neighborhood score and the six different independent variables. Like in the previous model, the VIF values do not prove high multicollinearity.[2]

Table 5: ANOVA table Florabuurt

Model		Sum of squares	df	Mean square	F
1	Regression	150.983	6	25.164	.614
	Residual	1270.728	31	40.991	
	Total	1421.711	37		

Notes: Dependent variable: neighborhood score. Predictors: (Constant), Role of community feeling, Role of infrastructure, Role of amenities, Role of housing, Role of green spaces, Role of safety. * Significance at 5%

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[2] There are two variables that have a higher VIF value; the role of amenities and the role of infrastructure. Although the role of infrastructure has the highest value seen so far, being 3,089, this value is not high enough to prove high multicollinearity.

Table 6: Coefficients table Florabuurt

Model		Unstandardized Coefficients		Standardized Coefficients
		B	Std. Error	Beta
1	(Constant)	73.252***	10.707	
	Role of green spaces	.103	.105	.192
	Role of amenities	.020	.124	.043
	Role of infrastructure	.029	.098	.088
	Role of housing	.070	.075	.183
	Role of safety	-.110	.100	-.237
	Role of community feeling	-.011	.066	-.034

Notes: Dependent variable: neighborhood score. *, **, *** Significance at 10%, 5%, and 1%, respectively.

The regression analyses for both neighborhoods did not result in many significant outcomes. For the Rivierenbuurt it can be said that there is a small positive relationship between amenities and neighborhood score and between infrastructure and neighborhood score, but none of the other variables were significant. It is notable that the role of green spaces is the least significant variable in the Rivierenbuurt, which is the neighborhood with a very small amount of green per person. In the Florabuurt none of the independent variables were significant. The role of green spaces is the second closest variable to significance in the Florabuurt, the neighborhood with a very high amount of green spaces. Thus, the results suggest that green spaces are more significant in determining neighborhood quality in the neighborhood with more green spaces. However, in order to really get a significant score for the role of green spaces, and to prove that there is a relationship between green spaces and neighborhood score, you would need to choose a much lower confidence interval, or collect a lot more data.

5. Conclusion and discussion

5.1 Conclusions

People's choice of residential location is dependent on many variables. A lot of these variables can be grouped together under the name neighborhood quality. How someone perceives neighborhood quality is very subjective and each of the influencing factors can be interpreted in different ways. The theoretical framework outlined the six most important factors in determining perceived quality of a neighborhood. The factors are; amenities, housing, infrastructure, safety, community feeling, and green spaces. These six factors then formed the base for the conceptual model and the quantitative analysis. Since there is little to no data or literature in which multiple of these factors are compared, it is impossible to say from a theoretical standpoint which factors are more important than others. This research tried to take a first step in filling this research gap.

In the literature, community feeling was described as being one of the most important factors for determining the quality of a neighborhood (Dassopoulos et al., 2012). However, for both researched neighborhoods, the role of community feeling had the lowest mean score. Thus, on average the respondents attributed the lowest importance to community feeling. One explanation for this could be that Dutch people might not attach great value to having strong relations with neighbors. A cultural difference that might have been overlooked in the literature. Another explanation for the low scores for the role of community feeling could be that people do value community feeling and strong relations within the neighborhood, but they do not think it is important in determining the quality of their neighborhood.

In both neighborhoods the role of safety, housing and green spaces were attributed the greatest importance for determining the quality of a neighborhood. The role of infrastructure and the role of amenities were thus ranked in the lower half for both neighborhoods, while the literature suggests that both factors are important determinants for neighborhood quality (Cervero, 2009; Elldér et al., 2022). An explanation for the relatively low scores of infrastructure could be that the quality of infrastructure is high in the Netherlands. Thus, there are no large differences between neighborhoods when it comes to infrastructure. Therefore people might decide that infrastructure is not that important in determining the quality of their neighborhoods. The same applies to amenities, on average amenities are present in each Dutch neighborhood, and even if amenities are not present in the own neighborhood, they are always accessible within short distances. Therefore, people might not attach great value to the role of amenities in determining the quality of their neighborhood. The fact that this is not discussed in existing literature might again be explained by cultural differences, the existing and used literature does not focus on the Netherlands and therefore might not be able to realistically predict the importance of some of the used factors.

However, although the mean scores can be used to determine which factors people find more or less important, they can not be used to prove a relationship between the six factors and perceived neighborhood quality, measured as the neighborhood score. In order to do this, a

multiple linear regression was performed for each neighborhood. For the Rivierenbuurt the model as a whole was significant, however, the only independent variables that gave a significant score were the role of amenities and the role of infrastructure. Therefore, a small positive relationship between amenities and neighborhood score, and between infrastructure and neighborhood score, can be seen in the Rivierenbuurt. This corresponds to the literature, in which more amenities are said to lead to increased neighborhood quality (Elldér et al., 2022).

The multiple linear regression for the Florabuurt gave insignificant results for both the model as a whole, and for the six independent variables. As a result the null hypothesis is accepted, there is no relationship between neighborhood score on the one hand and the role of green spaces, the role of amenities, the role of infrastructure, the role of housing, the role of safety, and the role of community feeling on the other hand. Collecting a lot more data could be useful and might improve the chance of a significant outcome. The outcome of the regression analyses does not correspond to the literature, in which authors claim that there are strong relationships between these six variables and the perceived quality of a neighborhood. This difference may be due to the relatively small dataset used for this analysis. Another reason could be that the relationship between perceived neighborhood quality and the six independent variables is not as clear or strong in Groningen, or the Netherlands, compared to the areas in which the data used in the literature was gathered.

5.2 Limitations

This research does have some limitations. The first limitation is related to the secondary data. This data was used to calculate the amount of green per person for the neighborhoods and to make the map of the distribution of green within the neighborhoods. Since this data is on a larger scale, and collected for the entire country, it is not as detailed as it could have been. As a result, only parks are measured as green spaces, while in reality there are smaller green areas throughout both neighborhoods in the form of trees along the sidewalk and small bushes or patches of grass. Therefore the distribution of green spaces shown in figure 2 does not show all green spaces in the neighborhoods, only the large areas.

Another limitation concerns the questions in the survey that was used to collect data for the quantitative analysis. By asking how important the role of each factor was in determining the quality of their neighborhood it was possible to rank the relative importance of the factors using the mean. However, this way of formulating the questions might be one of the reasons why the multiple linear regression did not produce significant results. It would have been useful to include questions where respondents were asked to rate for instance the green spaces in their neighborhood, and not just the importance of green spaces in determining the quality of their neighborhood.

5.3 Recommendations for further research

Further research could focus more in depth on the relative importance of the different factors influencing perceived neighborhood quality. For instance with a larger case study and sample size. It would also be interesting to look more into the cultural differences in the ranking of these

factors, since this research suggests that the relative importance of the factors influencing neighborhood quality might differ globally. Additionally, further research could go deeper into the importance of green spaces in the living environment. For instance, by not looking only at the effect on perceived neighborhood quality, but also on physical and mental health, and quality of life.

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Voor mijn bachelorscriptie als student Sociale Geografie en Planologie aan de Rijksuniversiteit Groningen onderzoek ik hoe buurtbewoners de woonkwaliteit van een buurt ervaren, en hoe dit wordt beïnvloed door de aanwezigheid van groenvoorzieningen. Woont u in de (Florabuurt/Rivierenbuurt) , zou u mij dan in een paar minuten willen helpen door 9 korte vragen te beantwoorden?

Het doel van deze enquête is om te meten wat voor u het relatieve belang van groenvoorzieningen is, ten opzichte van andere buurtkenmerken zoals voorzieningen, infrastructuur, huisvesting, veiligheid en sociale cohesie.

Deze enquête is volledig vrijwillig en anoniem, de resultaten worden enkel gebruikt voor dit onderzoek. Wanneer u besluit toch niet mee te willen doen, kunt u uw deelname beëindigen door de browser te sluiten.

Mocht u vragen hebben kunt u contact met mij opnemen via mijn mailadres: z.v.bastmeijer@student.rug.nl

1. Op een schaal van 0 tot 100, hoe zou u uw buurt in het algemeen beoordelen?

Ook de volgende vragen kunt u beantwoorden op een schaal van 0 tot 100. De vragen gaan over uw perceptie van de kwaliteit van specifieke kenmerken van uw buurt.

2. Hoe groot is voor u de rol van groenvoorzieningen in het bepalen van de kwaliteit van uw buurt?
Groenvoorzieningen zijn onder andere parken, gazons, bomen, speelweides, bloemperken en groenstroken.

3. Hoe groot is voor u de rol van voorzieningen in het bepalen van de kwaliteit van uw buurt?
Voorzieningen zijn bijvoorbeeld winkels, horeca, scholen en kinderopvang.

4. Hoe groot is voor u de rol van infrastructuur in het bepalen van de kwaliteit van uw buurt?
Infrastructuur omvat zowel parkeergelegenheid, kwaliteit van het wegennetwerk en bereikbaarheid vanuit de buurt (bijvoorbeeld richting het centrum of de stad uit).

5. Hoe groot is voor u de rol van huisvesting in het bepalen van de kwaliteit van uw buurt?
Huisvesting omvat oppervlakte van de huizen, onderhoud van de huizen, locatie, kosten en huisvestingsdichtheid.

6. Hoe groot is voor u de rol van veiligheid in het bepalen van de kwaliteit van uw buurt?
Veiligheid kan worden beïnvloed door criminaliteit, maar ook factoren als straatverlichting of het verkeer kunnen hier een rol in spelen.

7. Hoe groot is voor u de rol van sociale cohesie in het bepalen van de kwaliteit van uw buurt? Sociale cohesie, ook wel gemeenschapsgevoel, gaat voornamelijk over de onderlinge verhoudingen tussen bewoners.

8. Wat is uw leeftijd?
- Jonger dan 18 jaar
- 18 - 30
- 31 - 40
- 41 - 50
- 51 - 60
- Ouder dan 60 jaar

9. Wat is uw geslacht?
- Man
- Vrouw
- Anders/ Zeg ik liever niet

Appendix 2: Excel analysis neighborhoods

District	Neighborhood	Inhabitants	Park (ha)	Green / inhabitant (ha/person*1000)
Centrum	Binnenstad-Noord	4,440	0	X
	Binnenstad-Zuid	6,600	3	0.4545454545
	Binnenstad-Oost	3,920	0	X
	Binnenstad-West	1,765	0	X
	Noorderplantsoen	10	19	X
	Hurtusbuurt-Ebbingekwartier	5,510	0	X
	UMCG	0	0	X
	Stationsgebied	385	0	X
Oud-Zuid	De Meeuwen	1,500	3	2
	Oosterpoort	5,240	0	X
	Herewegbuurt	1,560	1	0.641025641
	Rivierenbuurt	4,530	1	0.2207505519
	Grunobuurt	2,240	0	X
	Badstratenbuurt	885	0	X
	Zeeheldenbuurt	3,265	0	X
	Laanhuizen	1,270	0	X
	Stadspark	20	65	X
	Martini Trade Park	0	0	X
Oud-West	Oranjebuurt	2,845	0	X
	Noorderplantsoenbuurt	3,875	0	X
	Schildersbuurt	5,860	0	X
	Kostverloren	2,240	1	0.4464285714
Oud-Noord	De Hoogte	3,975	2	0.5031446541
	Indische buurt	8,480	11	1.297169811
	Professorenbuurt	6,120	4	0.6535947712
Oosterparkwijk	Gorechtbuurt	4,930	5	1.014198783
	Vogelbuurt	2,045	9	4.400977995
	Bloemenbuurt	2,885	0	X
	Florabuurt	1,175	8	6.808510638
	Damsterbuurt	800	0	X
Zuidoost	De Linie	895	0	X
	Europapark	430	0	X
	Eemskanaal	65	5	X
	Kop van Oost	540	0	X
	Woonschepenhaven	130	0	X

District	Neighborhood	Inhabitants	Park (ha)	Green / inhabitant (ha/person*1000)
	Driebond	25	0	X
	Eemspoort	25	0	X
	Euvelgunne	55	0	X
	Winschoterdiep	50	0	X
	Stainkoel'n	0	0	X
	Roodehaan	25	0	X
	Waterhuizen	5	0	X
Helpman e.o.	Sterrebosbuurt	390	9	X
	Coendersborg	3,085	11	3.565640194
	Klein Martijn	660	1	X
	Villabuurt	935	0	X
	Helpman	6,170	0	X
	De Wijert	4,745	0	X
	De Wijert-Zuid	3,115	11	3.531300161
Zuidwest	Corpus den Hoorn	4,505	10	2.219755827
	Hoornse Meer	4,460	7	1.569506726
	Hoornse Park	700	8	X
	Van Swieten	5	0	X
	Piccardthof	1,230	6	4.87804878
	Bruilweering	40	0	X
Hoogkerk	Hoogkerk Dorp	1,835	0	X
	Hoogkerk-Zuid	5,550	12	2.162162162
	Westpoort	5	0	X
	Vierverlaten	130	0	X
	Zuidwending	45	0	X
	Leegkerk	75	0	X
	Gravenburg	2,335	7	2.997858672
	Suikerfabriekterrein	5	0	X
	Peizerweg	25	2	X
	Bangeweer	275	0	X
	De Buitenhof	1,630	0	X
	Kranenburg	0	0	X
	De Kring	335	0	X
Nieuw-West	Vinkhuizen-Noord	6,150	17	2.764227642
	Vinkhuizen-Zuid	4,780	14	2.928870293
	Hoendiep	125	0	X
	Friesestraatweg	45	0	X

District	Neighborhood	Inhabitants	Park (ha)	Green / inhabitant (ha/person*1000)
	Reitdiep	2,610	2	0.7662835249
	Dorkwerd	80	0	X
	De Held	2,670	14	5.243445693
	Westpark	40	6	X
Noordwest	Selwerd	6,455	12	1.859024012
	Paddepoel-Zuid	4,620	6	1.298701299
	Paddepoel-Noord	5,490	4	0.7285974499
	Zernike Campus	5	11	X
	Selwerderhof	5	1	X
	Tuinwijk	1,590	1	0.6289308176
Noordoost	Beijum-West	6,225	26	4.176706827
	Beijum-Oost	6,415	11	1.714731099
	De Hunze	2,500	7	2.8
	Van Starkenborgh	925	2	X
	Noorderhoogebrug	280	0	X
	Het Witte Lam	45	0	X
	Koningslaagte	70	0	X
	Hunzeboord	5	3	X
Noorddijk e.o.	Lewenborg-Noord	3,650	8	2.191780822
	Lewenbord-Zuid	3,520	8	2.272727273
	Lewenborg-West	1,885	17	9.018567639
	Oosterhoogebrug	2,220	0	X
	Ulgersmaborg	1,960	13	6.632653061
	Hunzepark	0	0	X
	Zilvermeer	225	2	X
	Kardinge	0	25	X
	Drielanden	970	3	X
	Noorddijk	105	0	X
	Ruischerbrug	490	1	X
	Ruischerwaard	1,365	7	5.128205128
Meerdorpen	Middelbert	110	0	X
	Engelbert	895	0	X
	Klein Harkstede	60	0	X
Meerstad e.o.	Meerstad	725	0	X
	Harkstede GN	220	0	X
	Lageland GN	85	0	X