

The Neighbourhood Factors That Make Young People Depressed: How Urban Planning Can Promote Better Subjective Well-Being

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Summary

Science has recognised the increasing mental health issues among young adults. This study explores how neighbourhood characteristics can relate to this issue by focusing on the subjective well-being of young people in Groningen and its relationship to perceived neighbourhood characteristics. To address this research objective, a literature review was conducted alongside an online survey involving 44 respondents. The survey data was analysed using Spearman's rank correlation and ordinal regression techniques. The study reveals key findings: positive correlation between subjective well-being determinants and perceived neighbourhood characteristics like leisure opportunities, neighbourliness, attachment, community, and meeting new people. Perceived characteristics also relate to life satisfaction and negative affect. Travel experience and neighbourhood diversity strongly impact life satisfaction, increasing the odds of being in a higher category. For example, each unit increase in travel experience or neighbourhood diversity multiplies the likelihood of higher life satisfaction by factors of 12,561 and 8,654 respectively. Additionally, an increase in perceived aesthetic appeal raises the odds of monthly negative emotions by a factor of 3,501. Conversely, higher negative affect reduces the odds of perceived safety by a factor of 0.165. These findings contribute to the growing body of research on well-being and urban studies, highlighting the importance of creating communities that prioritize the happiness and well-being of young people. This would be relevant for policymakers and urban planners involved in designing environments that foster positive mental health.

Key words: subjective well-being, perceived neighbourhood characteristics, young adults

Word count: 6454

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1. Introduction

1.1 Background

Psychology and urban studies have both paid a lot of attention lately to the study of subjective well-being (Das et al., 2020; Kent et al., 2017; Marans, 2003). Subjective well-being is defined as the personal evaluation and perception of an individual's happiness, life satisfaction, and overall well-being (OECD, 2013). People's subjective well-being is impacted by a number of variables, such as their social, economic, and environmental circumstances. Among these variables, neighbourhood qualities have become an important factor in people's well-being. In his book on the relation between mental health and the built environment, Halpern (2013) comes to the conclusion that there is a clear causal relationship between the built environment and one's mental health. Understanding the link between subjective well-being and perceived neighbourhood attributes might offer important insights into the elements that influence residents' overall happiness and sense of fulfilment in life.

Gaining a deeper understanding of this influence is crucial and relevant in today's time. The levels of poor mental health have significantly increased over the last decade. This is, however, the case only for people below 26 years of age (Twenge et al., 2019). This implies a generational shift in mental health disorders rather than a general increase across all ages. In the Netherlands, 18% of young people (12 to 24 years old) had mental health issues in 2021. In 2019 and 2020, this was still at 11% (CBS, 2022b). However, there is lack of research on how the immediate surroundings, such as the neighbourhood they live in, can influence young people's subjective well-being.

Neighbourhood satisfaction which is a domain of subjective well-being can be defined as "the residents' overall evaluation of a neighbourhood environment" (Hur et al., 2010). Research on neighbourhood satisfaction has significant consequences for practice and policy-making. In order to direct the creation of future neighbourhoods, both urban planners and private sector actors (such as real estate firms) rely on neighbourhood satisfaction studies. Additionally, neighbourhood associations and planners turn to such research to pinpoint important problems and maximise neighbourhood improvements with limited funding (Cao et al., 2018). Therefore, the concept of subjective well-being is relevant for the aim of this study.

The setting in Groningen, a city in the northern part of the Netherlands, makes for an interesting study of the relationship between neighbourhood characteristics and young people's subjective well-being. After Amsterdam, Utrecht and Rotterdam, Groningen has the largest student population in the Netherlands (*Top 10 Grootste Studentensteden Van Nederland*, n.d.). However, it has the highest proportion of students relative to the total population. With its population consisting of 25% students (*Groningen: Studentenstad*, 2023), Groningen provides a distinctive context to investigate the impact of the aforementioned relationship on this specific demographic.

The aim of this research is to determine whether subjective well-being of young adults in Groningen is correlated with perceived neighbourhood characteristics. To achieve this, the main research question is:

What is the relationship between perceived neighbourhood characteristics and the subjective well-being of young adults in Groningen?

In order to help answer the main research question, two sub-questions are posed:

What perceived neighbourhood characteristics have a high correlation with subjective well-being?

How do they affect residents' subjective well-being?

With the goal of helping urban planners, politicians, and community stakeholders improve the well-being of young people in Groningen, the study intends to pinpoint the neighbourhood features that are most closely linked to subjective well-being.

To accomplish these objectives, a mixed methods approach is employed, combining a literature review with online surveys. The literature review provides an in-depth understanding on the relevant characteristics for this study and the surveys will gather data on subjective well-being and perceived neighbourhood characteristics as experienced by young adults in Groningen.

This study adds to the increasing body of research on well-being and urban studies by examining the connection between perceived neighbourhood qualities and subjective well-being in Groningen. The results of this study might guide evidence-based initiatives and policies targeted at developing communities that support young people's well-being and happiness, ultimately resulting in a more welcoming and vibrant urban environment.

1.2 Structure of Thesis

This Bachelor's thesis is divided into several chapters. Firstly, a theoretical framework is laid out where the relevant theories and concepts are explained in order to clarify the context of the study. Subsequently, in the methodology section the research methods and the data analysis strategy are put across. The results section provides an overview of the outcomes of the data analysis as well as a discussion of the findings. Lastly, the thesis is summarized in the conclusion section where the findings are also put in a broader context in order to explain their societal implications. In addition, further research recommendations are proposed.

2. Theoretical Framework

2.1 Theories

2.1.1 Neighbourhood characteristics

Studies on the topic of neighbourhood characteristics and well-being define neighbourhood as the local area within 15 minutes walking distance from the respondent's dwelling. This is done in order to achieve a greater reliability among the respondents when asking them about accessibility to other areas (Mouratidis, 2020). However, this research studies the case of the city of Groningen which is deemed "15-minutes city" (Werz, 2020). The 15-minutes city concept entails being able to reach all essential facilities within 15 minutes by bike or foot (Schauenberg, 2023). Therefore, based on the size and accessibility of Groningen, neighbourhood in this study is defined as the local area within 10 minutes walking distance from the respondent's dwelling.

This research utilises the conceptual framework on neighbourhood characteristics developed by Mouratidis (2018). This framework is used to study the influence of built environments on subjective well-being and thus, it is relevant for this article. The framework distinguishes between objective and perceived neighbourhood characteristics.

Most studies focus on both objective and subjective characteristics of neighbourhoods. However, prior research frequently demonstrated that subjective rather than objective criteria are more likely to be statistically significant in models of neighbourhood satisfaction (Cao et al., 2018). Given this research focuses on the broader term encompassing neighbourhood satisfaction, namely subjective well-being, only subjective neighbourhood characteristics are taken into account.

2.1.1.1 Objective characteristics

The term "objective neighbourhood characteristics" refers to observable, quantifiable physical and environmental elements of a neighbourhood. There are two aspects of the objective neighbourhood characteristics – physical and sociodemographic. The physical characteristics are divided into internal and external.

The majority of recent research on neighbourhoods and health uses single- or multiple-item indexes of census data to assess socioeconomic conditions at the level of block groups, census tracts, postal codes, or other administratively delineated local areas or districts (Weden et al., 2008). While summary evaluations of the neighbourhood may be made using objective neighbourhood metrics, these evaluations might not be the most accurate for determining how neighbourhood members are exposed to, experience, or interact with their neighbourhoods in ways that have an impact on their health (Cummins et al., 2007; Weden et al., 2008).

2.1.1.2 Perceived characteristics

Perceived neighbourhood characteristics incorporate the individuals' subjective judgements, attitudes, and opinions about their neighbourhood. Thus, it is the individual experiences, interplay and impressions that are the basis of the perceived neighbourhood characteristics and they can impact the general residential satisfaction.

One main weakness of subjective measurements is same source bias, where correlations between subjective neighbourhood settings and health can be partially explained by unobserved

factors like psychological inclination. Despite same source bias being an important limitation, studies find independent correlations between subjectively assessed neighbourhood stressors and physical health outcomes, even when controlling for mental health outcomes (Ellaway & Macintyre, 1998)

The conceptual framework used in this study (Mouratidis, 2018) establishes 13 aspects of perceived characteristics which are listed and explained using example statements in Table 1.

Perceived neighbourhood characteristics	
Perceived neighbourhood characteristics	Description
Opportunities for leisure (leisure)	I feel like I have a lot of opportunities for leisure in my neighbourhood
Opportunities to meet new people (new people)	I feel like I have a lot of opportunities to meet new people in my neighbourhood
Proximity to friends/relatives (proximity to friends)	I live in proximity to friends/relatives in my neighbourhood
Perceived safety (safety)	I feel safe in my neighbourhood
Aesthetic quality (aesthetics)	I find my neighbourhood aesthetically appealing
Experienced travel to work/leisure/facilities (travelling)	I generally feel like I have a pleasant experience travelling to work/leisure/activities
Liveliness (liveliness)	I feel like my neighbourhood is lively
Neighbourliness (neighbourliness)	I feel like my neighbours are likely to help each other
Place attachment (attachment)	I feel attached to my neighbourhood
Sense of community in neighbourhood (community)	I feel like there is a close community in my neighbourhood
Neighbourhood reputation (reputation)	I feel like my neighbourhood has a good reputation
Neighbourhood diversity (diversity)	I feel like my neighbourhood is diverse
Encourages walking/biking (walking/biking)	I feel like my neighbourhood encourages walking/biking

Table 1: Perceived neighbourhood characteristics and their descriptions

2.1.2 Subjective well-being

The Organisation for Economic Co-operation and Development (OECD) (2013) institutes guidelines on measuring subjective well-being. The organisation comes up with the following definition:

“Good mental states, including all of the various evaluations, positive and negative, that people make of their lives and the affective reactions of people to their experiences” (OECD, 2013)

This definition is supposed to include many different aspects of subjective well-being. The main purpose of it is to identify the perception of people on the way they experience and assess their life without including objective concepts.

Research suggests that the countries with the highest subjective well-being tend to experience economic growth and wealth, a strong rule of law and human rights, lower corruption, effective and efficient governments, progressive taxation laws, income and job security programmes, political freedoms and protection, lower unemployment rates, better overall health, and income equality (Das et al., 2020).

The OECD (2013) divides subjective well-being into 3 categories – hedonic well-being/affect, life satisfaction/life evaluation and eudaimonia. Several scholars studying subjective well-being utilise this framework. For example, Mouratidis (2019) compares the effects of compact and low-density sprawled urban form on subjective well-being taking the case of Oslo metropolitan area. He uses the main OECD framework but distinguishes between four determinants of subjective well-being – life satisfaction, eudaimonia, happiness (hedonic) and anxiety (hedonic). Moreover, research by Zhang & Zhang (2017) studies the perceived residential environment of neighbourhood and the subjective well-being among the elderly in China and also utilises the framework for subjective well-being established by the OECD (2013). However, the researchers divide hedonic well-being/affect into two separate categories – positive and negative affect. They also state that fewer research pay attention to the positive effects of residential environment – the majority of studies concentrate on the bad consequences associated to the neighbourhood environment (Zhang & Zhang, 2017). Therefore, in order to get explicit evidence for both, this research is based on the subjective well-being aspects listed in Table 2. Life satisfaction, eudaimonia and hedonic well-being are the main aspects established by the OECD (2013) and the sub aspects are listed below the corresponding main aspect and described.

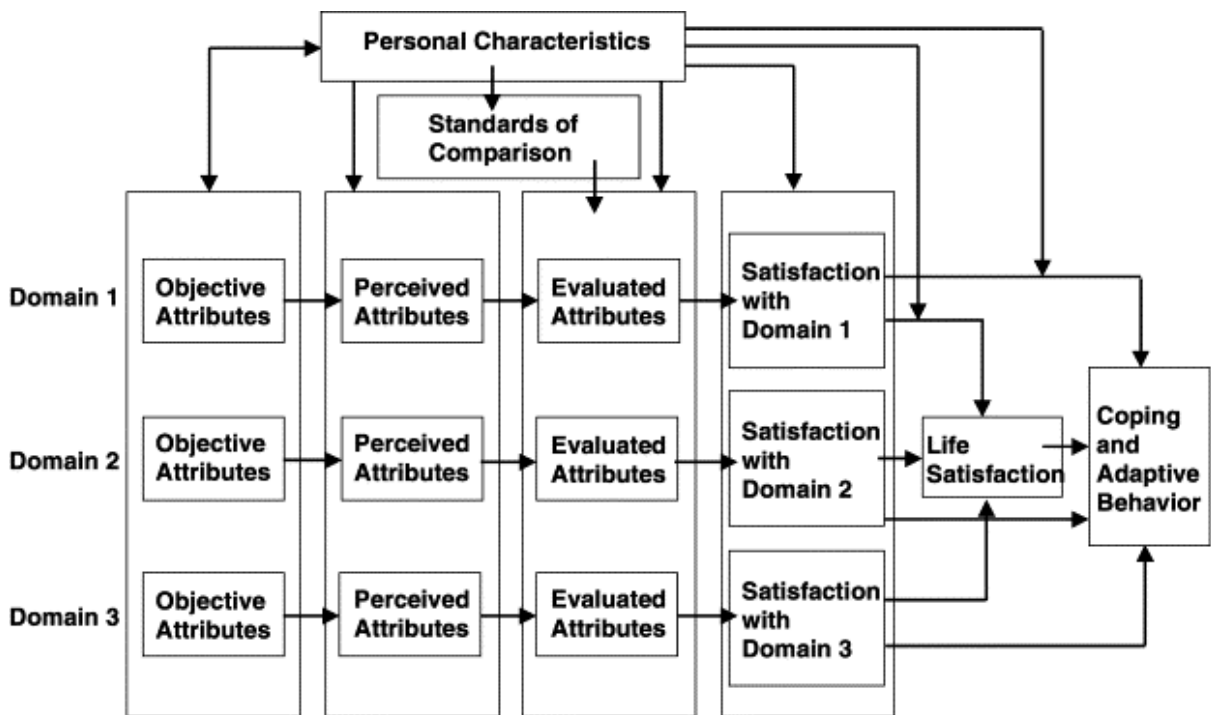
Subjective well-being aspects	
Aspects	Description
1. Life satisfaction (LS)	Reflective assessment on a person's life or some specific aspect of it; I am satisfied with my life
2. Eudaimonia (E)	A sense of meaning and purpose in life
2.1 Value	I have a system of values and beliefs that guide my daily activities
2.2 Purpose in life	I have found a really significant meaning in my life
2.3 Life goals	In my life, I have goals and aims
2.4 Reflections on the past	I am at peace with my past
3. Hedonic well-being	A person's feelings or emotional states, typically measured with reference to a particular point in time

3.1 Positive affect (PA)	During the past month I have felt: excited, enthusiastic, inspired, alert, determined
3.2 Negative affect (NA)	During the past month I have felt: distressed, upset, scared, nervous, angry

Table 2: Subjective well-being aspects and their descriptions

2.1.3 The correlation between perceived neighbourhood characteristics and subjective well-being

The link between the urban environment and subjective well-being has been demonstrated in conceptual frameworks and empirical studies (Campbell et al., 1976; Marans, 2003; Mouratidis & Yiannakou, 2022). In Figure 1, the model provided by Campbell et al. (1976) shows the relationship between domain satisfaction and life satisfaction which leads to coping and adaptive behaviour. According to such conceptual frameworks and empirical research, neighbourhood satisfaction is a key link between the urban environment and people's subjective well-being and is positively correlated with eudaimonia, happiness, and life satisfaction (Cao et al., 2018; Mouratidis & Yiannakou, 2022).



* From Campbell, Converse, and Rodgers, 1976.

Figure 1: The link between the urban environment and subjective well-being (Campbell et al., 1976)

As outlined above, researchers studied the relationship between perceived neighbourhood environment and subjective well-being among Chinese elderly and they found that the neighbourhood environment was adversely correlated with negative affect but favourably correlated with life satisfaction, meaning in life and positive affect (Zhang & Zhang, 2017). They also found sense of community to have a mediating role between the neighbourhood environment and life satisfaction, eudaimonia and positive affect (Zhang & Zhang, 2017).

However, Hogan et al. (2016) find that there is a difference in how urban design affects various age groups. Their findings show that younger inhabitants’ happiness is influenced by their cities’ attractiveness and their ease of access to amenities like culture, commerce, transportation, parks, and sports. On the other hand, senior citizens’ contentment is more strongly correlated with the delivery of high-quality government services. Therefore, it is worthwhile to study the effects of the urban environment on specific age cohorts. In addition, based on these findings, hypotheses for this research are that aesthetic quality has a positive effect on subjective well-being and that experienced travel to work/leisure/facilities is positively correlated with subjective well-being.

Research also demonstrates that the urban form should also be taken into account. The aforementioned study by Mouratidis (2019) compares the effects of compact and low-density sprawled urban form on subjective well-being. When controlling for certain relevant urban problems, namely perceived safety, noise and cleanliness, the author suggests that there is a significant positive association of compactness with subjective well-being. Taking this into account, it could be hypothesized that low perceived safety is associated with high negative affect.

2.2 Conceptual model

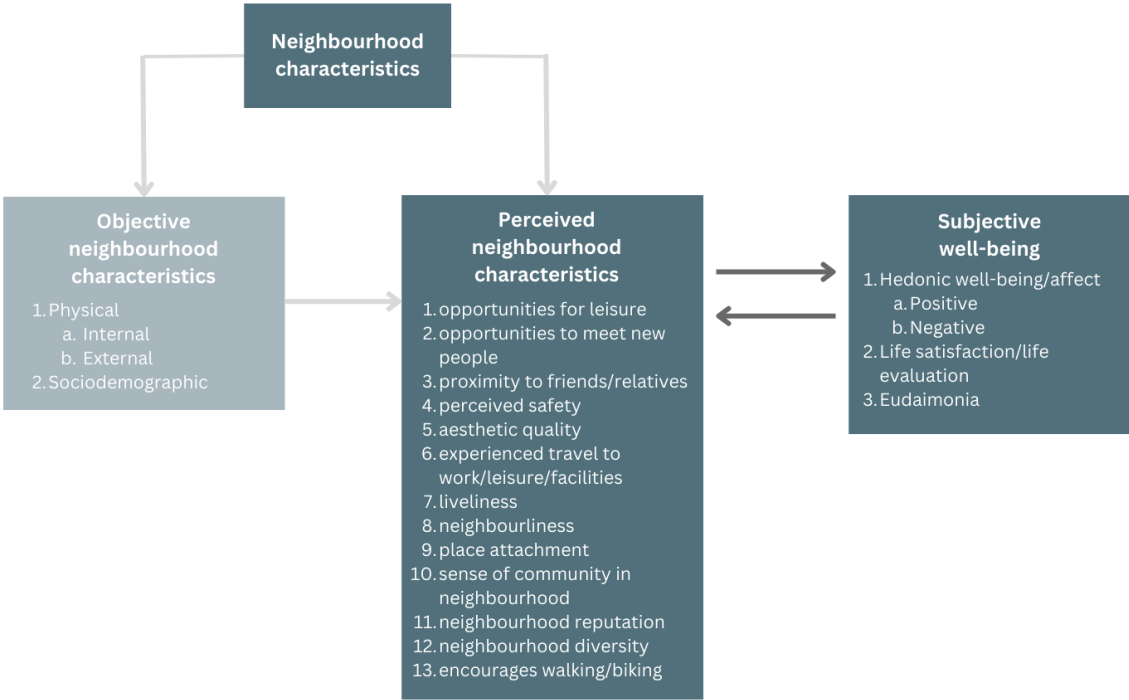


Figure 2: Conceptual model (Author)

The purpose of this conceptual model is to illustrate the relationship that this article studies – the correlation between perceived neighbourhood characteristics and subjective well-being which is visualised with two arrows between the corresponding variables. Objective neighbourhood characteristics are also listed but only perceived ones are of interest to this study.

3. Methodology

3.1 Research method

This research is based on two different research methods. Firstly, a literature review to gather background information on neighbourhood characteristics, subjective well-being, and their relationship, using academic article search engines. Secondly, an online survey to collect primary data on perceived neighbourhood characteristics and subjective well-being of young adults in Groningen. The survey is suitable for capturing subjective well-being and allows for a quantitative analysis of rather qualitative data.

The survey was personally distributed in group chats, Facebook groups, LinkedIn and Reddit, and it was open to all residents of Groningen who are at least 18 years old. Participation in the survey was entirely voluntary and anonymous as the participants were not asked for personally identifiable information. In addition, the data collected from the survey is used solely for academic purposes and is kept strictly confidential in an online cloud.

The survey was created on Google Forms as it ensures the protection and storage of the gathered data. The full survey can be seen in Appendix A. In the beginning, the aim of the survey is explained as well as a few disclaimers about the ethical considerations. Following this, the participants are asked to rate the perceived characteristics of their neighbourhood on the 5-point Likert scale from 'strongly disagree' to 'strongly agree'. Afterwards, the respondents are asked to rate their subjective well-being. Firstly, they have to rate their life satisfaction and eudaimonia on a 5-point Likert scale from 'strongly disagree' to 'strongly agree'. Then, they are asked to rate their positive and negative affect on the scale 'never', 'rarely', 'sometimes', 'often' and 'always'. The survey ends with several questions on the participants' individual sociodemographic variables – time living in the present dwelling, number of people with whom they share a household, gender and age group. These are used in the data analysis as control variables. The survey was open to be filled out for 10 days.

3.2 Data analysis

Because of the nature of the survey the variables positive affect, negative affect and eudaimonia each have several determinants as visible in Table 2. From these determinants a median is calculated making up each of the variables in order to perform the appropriate statistical tests. The descriptive statistics of all of the variables used in this analysis are shown in Table 3.

The median is utilised because of the ordinal nature of the data – the values have a specific order or rank but lack precise numerical differences between them. Among the subjective well-being determinants, life satisfaction, eudaimonia and positive affect all have a median of 4 on the 5-point Likert scale. On the other hand, negative affect has a median of 2 on the same scale. Therefore, the respondents have a relatively high subjective well-being. When it comes to the perceived neighbourhood characteristics, perceived encouragement to walk or bike scores the highest with a median of 4,5 on the Likert scale. This can be explained with the fact that Groningen is a 15-minute city and residents can reach all services within 15 minutes walking (Werz, 2020). The perceived neighbourhood characteristic that scores the lowest is the perceived sense of community. This could be because neighbourhood community events do not usually cater to the young population. In addition, young people are more mobile and do not necessarily only socialise with their neighbours – they create their social circles elsewhere.

Descriptive statistics						
	N		Median	Std. Deviation	Minimum	Maximum
	Valid	Missing				
LS	44	0	4,00	0,509	3	5
E	44	0	4,00	0,5278	2,5	5,0
PA	44	0	4,00	0,538	3	5
NA	44	0	2,00	0,789	1	4
Leisure	44	0	3,50	0,925	2	5
New people	44	0	3,00	0,974	2	5
Proximity to friends	44	0	4,00	1,177	1	5
Safety	44	0	4,00	0,888	2	5
Aesthetics	44	0	4,00	1,029	2	5
Travelling	44	0	4,00	0,664	2	5
Liveliness	44	0	4,00	0,930	2	5
Neighbourliness	44	0	3,00	1,087	1	5
Attachment	44	0	3,00	1,039	1	5
Community	44	0	2,00	1,129	1	5
Reputation	44	0	3,00	1,091	1	5
Diversity	44	0	4,00	1,041	1	5
Walking/biking	44	0	4,50	0,776	2	5

Table 3: Descriptive statistics on life satisfaction (LS), eudaimonia (E), positive affect (PA), negative affect (NA) and the perceived neighbourhood characteristics

In addition to the descriptive statistics, the sample demographic characteristics are displayed in Table 4. There is an almost even number of male and female respondents which suggests that the sample is balanced in terms of gender representation. However, the number of non-binary respondents is far from representative which means that conclusions about this group cannot be made. Over 80% of the respondents are between the ages of 18 and 24 and the rest consists of individuals between 25 and 34 years old. Both of these groups are considered “young people” in this study hence they are taken into account. Furthermore, the majority of the survey respondents have lived in their present dwelling between 1 and 3 years. This leads us to believe that they generally have a good understanding of their neighbourhood especially given the relatively small size of Groningen. Finally, the mean household size among the participants in the survey is 2,6 persons. This is higher than the 2022 Dutch national average of 2,1 persons (CBS, 2022a). This could be due to the nature of the sample as many young people cannot afford to live by themselves.

Sample demographic characteristics		
N = 44	Frequency	Percentage
Gender		
Male	21	47,73
Female	22	50,00
Non-binary	1	2,27
Age		
18 to 24	36	81,82
25 to 34	8	18,18
35 to 44	0	0,00
45 to 54	0	0,00
55 to 64	0	0,00
65 and above	0	0,00
Time living in the present dwelling		
Less than 1 year	13	29,55
Between 1 and 3 years	26	59,09
Between 3 and 5 years	4	9,09
Between 6 and 10 years	1	2,27
More than 10 years	0	0,00
	Mean	SD
Number of people in the household	2,6	2,2

Table 4: Sample demographic statistics

In order to answer the research questions, a Spearman's rank correlation and an ordinal regression are performed. The Spearman's rank correlation coefficient assesses the monotonic relationship between two ordinal variables. It determines whether there is a consistent pattern of change between the variables without assuming a linear relationship. In this case, it will help understand the strength and direction of the relationship between perceived neighbourhood characteristics and subjective well-being among young adults in Groningen.

An ordinal regression analysis, specifically a cumulative odds ordinal logistic regression with proportional odds, is performed to answer the second sub-question. Ordinal regression is a statistical method used to model the relationship between an ordinal dependent variable and one or more independent variables. In this case, this paper aims to predict the subjective well-being (ordinal dependent variable) based on the perceived neighbourhood characteristics (independent variable). Ordinal regression allows to estimate the relationship between the independent variable(s) and the odds of being in a particular category or higher category of the ordinal dependent variable. It takes into account the ordinal nature of both variables and provides estimates of the effect size and significance.

The ordinal regression is a suitable test to analyse the data at hand for several reasons. Firstly, the dependent variable is measured at the ordinal level since subjective well-being is estimated based on the 5-point Likert scale. Secondly, all of the independent variables, the perceived neighbourhood characteristics, are ordinal. Ordinal variables can be treated as either continuous or categorical. For the purpose of this paper, they are assumed to be continuous because of the fact that they appear in the dataset as numbers. Thirdly, there are no issues with multicollinearity. If there are problems with multicollinearity (the VIF is higher than 10) it

would be difficult to determine which variable helps to explain the dependent variable and technical difficulties arise when computing an ordinal regression. However, as it is visible in Table 5, there no issues and therefore, an ordinal regression can be employed.

Collinearity Statistics		
Variables	Tolerance	VIF
Leisure	0,488	2,049
New people	0,656	1,524
Proximity to friends	0,623	1,605
Safety	0,614	1,628
Aesthetics	0,496	2,017
Travelling	0,689	1,452
Liveliness	0,493	2,027
Neighbourliness	0,354	2,827
Attachment	0,423	2,363
Community	0,431	2,32
Reputation	0,47	2,129
Diversity	0,525	1,906
Walking/biking	0,395	2,532

Table 5: Collinearity statistics

For the purposes of this paper, a cumulative odds ordinal logistic regression with proportional odds is carried out in SPSS. This requires five sets of procedures. The first procedure is working with the Output Management System (OMS) Control Panel. This is because the PLUM procedure (the standard ordinal regression procedure in SPSS) does not produce the output needed to answer the questions this paper is concerned with, the odds ratios and their 95% confidence intervals in particular. These are produced when working with OMS. The second step is running the PLUM procedure which generates the main results of the ordinal regression analysis. The third procedure is outputting the PLUM parameters estimates using OMS. Then, the newly-created file containing the main outputs of the ordinal regression is saved. Finally, the fifth procedure is generating the odds ratios and their 95% confidence intervals using syntax.

Given that it is desired to determine the relationship between the perceived neighbourhood characteristics and the four determinants of subjective well-being, four ordinal regressions are performed. The five step procedure explained above is performed with the perceived neighbourhood characteristics as a predictor (independent variable) and life satisfaction, eudaimonia, positive affect and negative affect as criterion (dependent variable) accordingly. Therefore, there are four separate regressions that are discussed in this analysis. The interpretation of these analyses is covered in the following section.

4. Results

4.1 Correlation

To test which perceived neighbourhood characteristics have a significant correlation with the four measures of subjective well-being, a number of Spearman's rank correlations was performed. Table 6 gives an overview of the results. * and ** indicate coefficients are significant to the 5% and 1% respectively.

Correlations results								
	LS		E		PA		NA	
	Correlation coefficient	Significance (2-tailed)	Correlation coefficient	Significance (2-tailed)	Correlation coefficient	Significance (2-tailed)	Correlation coefficient	Significance (2-tailed)
Leisure	,450**	0,002	0,201	0,190	0,113	0,464	-0,099	0,522
New people	0,159	0,304	0,256	0,094	,530**	0,000	-0,132	0,394
Proximity to friends	-0,049	0,750	-0,115	0,457	-0,094	0,546	0,030	0,847
Safety	0,072	0,644	-0,007	0,963	0,055	0,722	-0,234	0,126
Aesthetics	0,158	0,305	0,086	0,580	-0,095	0,538	0,261	0,088
Travelling	0,156	0,313	0,038	0,809	-0,182	0,236	0,070	0,652
Liveliness	0,252	0,099	0,203	0,185	0,061	0,693	0,154	0,318
Neighbourliness	,388**	0,009	,327*	0,030	0,102	0,509	0,062	0,687
Attachment	,444**	0,003	0,231	0,131	-0,047	0,764	0,003	0,984
Community	,402**	0,007	0,108	0,484	0,061	0,693	-0,186	0,228
Reputation	0,018	0,909	0,144	0,351	0,046	0,768	0,125	0,420
Diversity	0,265	0,082	0,013	0,931	0,107	0,490	-0,019	0,901
Walking/biking	0,110	0,477	0,133	0,388	-0,042	0,788	0,240	0,117

Table 6: Correlation results. * and ** indicate coefficients are significant to the 5% and 1% respectively

The results show that there is a significant relationship between several combinations of variables. There is a statistically significant positive correlation between life satisfaction and opportunities for leisure, neighbourliness, neighbourhood attachment and sense of community. This indicates that individuals who report higher levels of perceived opportunities for leisure, perceived neighbourliness, neighbourhood attachment or sense of community tend to have higher levels of life satisfaction. Additionally, there is a statistically significant positive correlation between eudaimonia and perceived neighbourliness. Therefore, residents who report higher levels of perceived neighbourliness tend to have higher levels of eudaimonia. Furthermore, there is a significant positive correlation between positive affect and perceived opportunities to meet new people in the neighbourhood. This means that we may assume that people who report higher levels of perceived opportunities to meet new people in their neighbourhood experience positive emotions on a monthly basis more often. There are no significant correlations between negative affect and any of the perceived neighbourhood characteristics. However, the correlation coefficients are relatively low and some of them are negative. Therefore, it would be beneficial to explore this relationship further with more survey participants.

These results relate to the first sub-question with which this study is concerned. Based on the correlation analysis, we may assume that opportunities to meet new people, opportunities for leisure, neighbourhood attachment, sense of community and neighbourliness have the highest correlation with subjective well-being. This does not align with the hypotheses set out by this research as the aesthetic quality, experienced travel to work/leisure/facilities and perceived

safety do not have a significant correlation with none of the subjective well-being determinants. However, the findings do relate to the results of Zhang & Zhang (2017) who state that sense of community plays a mediating role between subjective well-being and life satisfaction, eudaimonia and positive affect for elderly. This questions the previously accepted differences between age groups and provides opportunities for further research.

4.2 Ordinal regression

In order to determine how perceived neighbourhood characteristics affect the four aspects of subjective well-being, four ordinal regressions are performed. The results of the ordinal regressions are visualised in Table 7. As in Table 6 * and ** indicate coefficients are significant to the 5% and 1% respectively.

Ordinal regression results									
	Model Fit		Goodness-of-Fit		Pseudo R-Squared			Test of Parallel Lines	
	Chi-Square	Sig.	Pearson	Deviance	Cox and Snell	Nagelkerke	McFadden	Chi-Square	Sig.
LS	32,747	0,002**	<0,001	1,000	0,525	0,682	0,507	31,828	0,003**
E	13,532	0,408	0,739	1,000	0,265	0,287	0,119	44,644	0,756
PA	17,586	0,174	0,917	0,980	0,329	0,419	0,259	-	-
NA	23,958	0,032*	0,974	0,999	0,420	0,469	0,240	16,616	0,920

Table 7: Ordinal regression results, * and ** indicate coefficients are significant to the 5% and 1% respectively

The results show a significant relationship between life satisfaction on one hand and perceived neighbourhood characteristics on the other with a significance level of 0,2%. Also, there is a significant relationship between negative affect and perceived neighbourhood characteristics with a probability value of 3,2%. Therefore, the subsequent discussion of the results is only concerned with those two regressions.

The ordinal regression which employs life satisfaction as criterion provides several measures to examine the overall regression. The fact that the Pearson test of Goodness-of-Fit is significant indicates that the model does not fit the observed data well. This suggests that there may be a lack of fit between the ordinal regression model and the actual response patterns observed in the data. However, the Deviance is not significant which does not suggest a significant deviation between the model's predicted values and the observed values. The three measures of Pseudo R-Squared which measure the proportion of variation explained by the model provide relatively consistent results despite the difference in conservatism between them. The Cox and Snell R-Squared is 52,5% which indicates a relatively good fit but this measurement tends to underestimate the proportion of explained variation. The Nagelkerke R-Squared at 68,2% provides an improved estimate of the proportion of explained variation compared to Cox and Snell. McFadden's R-Squared is the most conservative measure out of the three and tends to produce lower values. In this case it is 50,7% which does not differ outstandingly. Finally, the test of parallel lines is significant with a probability value of 0,3%. This indicates that the assumption of parallel lines is violated. This suggests that the relationship between perceived neighbourhood characteristics and the cumulative log odds of life satisfaction differs across different levels of the outcome.

The measures of Goodness-of-Fit for the ordinal regression where negative affect is the criterion are not significant. Therefore, we may assume that there is no significant deviation

between the model's predicted values and the observed values. The three measures of proportion of variation explained are 42%, 46,9% and 24% respectively which suggests a lower goodness of fit than the one concerning life satisfaction. However, it is still not too low. The test of parallel lines is not significant with a p-value of 92%. Therefore, we may assume that the relationship between perceived neighbourhood characteristics and the cumulative log odds of life satisfaction does not differ across different levels of the outcome.

Using the OMS allows for a further analysis of the ordinal regressions. The results generated from this, namely the odds ratios, are visualised in Table 8 where * and ** indicate coefficients are significant to the 5% and 1% respectively.

	Odds ratios							
	LS		E		PA		NA	
	Estimate	Exp(B)	Estimate	Exp(B)	Estimate	Exp(B)	Estimate	Exp(B)
Leisure	2,678	14,559	0,061	1,062	0,102	1,108	-0,180	0,835
New people	-0,236	0,790	0,391	1,479	1,536**	4,647	-0,760	0,468
Proximity to friends	-1,315	0,268	-0,387	0,679	0,550	0,577	-0,087	0,917
Safety	0,009	1,010	0,075	1,078	-0,009	0,991	-1,803**	0,165
Aesthetics	0,753	2,124	-0,390	0,677	-0,415	0,660	1,253*	3,501
Travelling	2,531*	12,561	0,487	1,628	-0,024	0,977	0,253	1,287
Liveliness	-0,804	0,448	0,038	1,038	0,037	1,038	0,865	2,375
Neighbourliness	-0,045	0,956	0,908	2,479	0,045	1,046	0,602	1,825
Attachment	0,579	1,785	0,355	1,426	0,064	1,066	-0,956	0,385
Community	0,952	2,591	-0,553	0,575	-0,451	0,637	-0,794	0,452
Reputation	0,126	1,134	0,672	1,959	0,168	1,183	0,535	1,708
Diversity	2,158*	8,654	0,406	1,501	0,521	1,683	0,555	1,741
Walking/biking	-1,870	0,154	-0,329	0,720	-0,314	0,730	-0,566	0,568

Table 8: Odds ratios, * and ** indicate coefficients are significant to the 5% and 1% respectively

Based on these results it is possible to interpret how a single unit increase or decrease in a specific perceived neighbourhood characteristics variable was associated with the odds of the subjective well-being variable having a higher or lower value. Looking at the regression where life satisfaction is the criterion, there are two significant estimates – perceived travel experience to work/leisure/hobbies and neighbourhood diversity. Derived from the exp(B) we may assume that for every one unit increase in perceived travel experience to work, leisure or hobbies, the odds of being in a higher category of life satisfaction increase by a factor of 12,561. Furthermore, we may assume that for every one unit increase in perceived neighbourhood diversity, the odds of being in a higher category of life satisfaction increase by a factor of 8,654.

When negative affect is the dependent variable, there are also two significant estimates – perceived safety and aesthetic appeal of the neighbourhood. However, the estimate for perceived safety is negative and its exponential of the coefficient is lower than 1. Therefore, we may assume that for each unit increase in negative affect the odds of reporting a lower level

category of perceived safety decrease by a factor of 0,165. This implies that experiencing more negative emotions on a monthly basis is associated with a decreased likelihood of having a higher perceived safety. On the other hand, for every one unit of increase in perceived aesthetic appeal of the neighbourhood, the odds of experiencing negative emotions on a monthly basis more often increase by a factor of 3,501.

Given that the overall regression where positive affect is the dependent variable is not significant, caution should be exercised when interpreting individual parameter estimates because it implies that the model does not explain a significant amount of the variability in the dependent variable based on the independent variables and covariates included in the model. Consequently, despite there being a statistically significant association between positive affect and perceived opportunities to meet new people, this relationship may be weak or non-existent because of failing to reject the null hypothesis of the overall regression.

The results of the ordinal regression serve to answer the second sub-question about the effect of perceived neighbourhood characteristics on subjective well-being. The outcomes suggest that perceived neighbourhood characteristics have an effect on life satisfaction and negative affect in particular. The specific perceived neighbourhood characteristics that have an effect are experienced travel to work/leisure/facilities, neighbourhood diversity, aesthetics and safety. This relates to the hypotheses and past research on the topic as those suggest the importance of aesthetic quality, experienced travel and safety. However, as the significant effect of neighbourhood diversity is an unforeseen discovery, it could be explored further. This could be done by studying different age groups as the previous findings suggested little to no difference between generations.

Finally, based on these outcomes, we may assume that there is a significant relationship between perceived neighbourhood characteristics and the subjective well-being of young adults in Groningen. In spite of that, it is important to acknowledge that this study aims for an overview of the relationship rather than a comprehensive review given the number of respondents and the limited existing research on the topic.

5. Conclusion

The purpose of this study is to examine the relationship between perceived neighbourhood characteristics and the subjective well-being of young adults in Groningen. To address this, the correlation between the two variables as well as the effect of neighbourhood characteristics on subjective well-being are studied.

The findings suggest that there is a correlation between opportunities for leisure, neighbourliness, neighbourhood attachment, sense of community and opportunities to meet new people on one hand and aspects of subjective well-being on the other. In addition, experienced travel to facilities, diversity, perceived safety and aesthetic quality have a significant effect on aspects of well-being.

These results do not fully overlap with existing literature (Hogan et al., 2016; Mouratidis, 2019). However, some of the results indicate similarities between young people's perceptions and those of elderly people based on existing research (Zhang & Zhang, 2017). This could serve as inspiration for city planners to focus on the aspects of the built environment that matter to every generation.

This paper contributes to the growing corpus of research on well-being and urban studies and it highlights the importance of designing neighbourhoods that stimulate happiness and well-being among young people. The findings of this study have significant implications for the development of evidence-based programs and policies. By creating neighbourhoods that prioritize young people's happiness and well-being, we can foster a more welcoming and vibrant urban environment.

Future research could explore the relationship between perceived neighbourhood characteristics and subjective well-being of young adults in cities that are not as student focused as Groningen. In addition, it would be beneficial to include objective neighbourhood characteristics in the analysis for a more thorough review. Such analysis could provide a lot of insight on policy advice.

This study emphasises the importance of raising the standard of urban living for the benefit of all citizens. It directly contributes to enhanced quality of life and overall societal well-being.

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7. Appendix

7.1 Appendix A - survey

Neighbourhood characteristics and subjective well-being in Groningen

Dear participant,

The purpose of this survey is to gather information on the relationship between perceived neighbourhood characteristics and subjective well-being of residents in Groningen, Netherlands, for a bachelor's thesis. The survey will take between 5 and 10 minutes and will consist of a series of questions designed to gather information about the your neighbourhood and subjective well-being.

The survey is open to all residents of Groningen who are at least 18 years old. Participation in the survey is entirely voluntary and anonymous. The data collected from the survey will be used solely for academic purposes and will be kept strictly confidential.

By filling out this survey, you consent to your answers being used as part of the data for my bachelor's thesis.

Thank you for taking the time to fill this out and for your contribution!

Lilia Boyadzhieva, third-year student in Spatial Planning and Design at the University of Groningen

** Indicates required question*

1. I live in Groningen *

Mark only one oval.

Yes

No

Perceived neighbourhood characteristics

For the purpose of this questionnaire, please consider your neighbourhood as the local area within 10 minutes walking distance from your dwelling

2. I feel like I have a lot of opportunities for leisure in my neighbourhood *

Mark only one oval.

Strongly disagree

1

2

3

4

5

Strongly agree

3. I feel like I have a lot of opportunities to meet new people in my neighbourhood *

Mark only one oval.

Strongly disagree

1

2

3

4

5

Strongly agree

4. I live in proximity to friends/relatives *

Mark only one oval.

Strongly disagree

1

2

3

4

5

Strongly agree

5. I feel safe in my neighbourhood *

Mark only one oval.

Strongly disagree

1

2

3

4

5

Strongly agree

6. I find my neighbourhood aesthetically appealing *

Mark only one oval.

Strongly disagree

1

2

3

4

5

Strongly agree

7. I generally feel like I have a pleasant experience travelling to work/leisure/facilities



Mark only one oval.

Strongly disagree

1

2

3

4

5

Strongly agree

8. I feel like my neighbourhood is lively *

Mark only one oval.

Strongly disagree

1

2

3

4

5

Strongly agree

9. I feel like my neighbours are likely to help one another *

Mark only one oval.

Strongly disagree

1

2

3

4

5

Strongly agree

10. I feel attached to my neighbourhood *

Mark only one oval.

Strongly disagree

1

2

3

4

5

Strongly agree

11. I feel like there is a close community in my neighbourhood *

Mark only one oval.

Strongly disagree

1

2

3

4

5

Strongly agree

12. I feel like my neighbourhood has a good reputation *

Mark only one oval.

Strongly disagree

1

2

3

4

5

Strongly agree

13. I feel like my neighbourhood is diverse *

Mark only one oval.

Strongly disagree

1

2

3

4

5

Strongly agree

14. I feel like my neighbourhood encourages walking/biking *

Mark only one oval.

Strongly disagree

1

2

3

4

5

Strongly agree

Subjective well-being

15. I am satisfied with my life *

Mark only one oval.

Strongly disagree

1

2

3

4

5

Strongly agree

16. I feel like... *

Mark only one oval per row.

	Stongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I have a system of values and beliefs that guide my daily activities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have found a really significant meaning in my life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In my life, I have goals and aims	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am at peace with my past	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

17. During the past month I have felt *

Mark only one oval per row.

	Never	Rarely	Sometimes	Often	Always
Excited	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enthusiastic	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inspired	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Alert	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Determined	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

18. During the past month I have felt *

Mark only one oval per row.

	Never	Rarely	Sometimes	Often	Always
Distressed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Upset	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Scared	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nervous	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Angry	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Last few questions

Here, you will be asked for some personal information

19. How long have you been living in your current residence? *

Mark only one oval.

- Less than 1 year
- Between 1 and 3 years
- Between 3 and 5 years
- Between 6 and 10 years
- More than 10 years

20. How many people live in your household including yourself? *

21. What is your gender? *

Mark only one oval.

- Male
- Female
- Non-binary
- Prefer not to say
- Other: _____

22. What is your age? *

Mark only one oval.

- 18 to 24
- 25 to 34
- 35 to 44
- 45 to 54
- 55 to 64
- 65 and above