Exploring socio-demographic factors and the effect on well-being

A case study of Assen, The Netherlands

Abstract

This paper is a case study of Assen, a provincial capital city in the Netherlands. This paper aims to answer the main question: *'To what extent do socio-demographical factors affect the factors of subjective well-being and wider social well-being, in the city of Assen?'*. To discover these socio-demographic factors a social atlas of geographies of Assen is created. The paper further analyses to what extent income inequality affects factors of subjective well-being. The analysis is carried out by a regression model using CBS and KWIZ data. The dataset of CBS provides information about percentages of income groups on a neighbourhood level. The KWIZ-data provides information about the factors of subjective well-being per neighbourhood. To conclude the extent to which the socio-demographical factors of low-education and unemployment are affected by socio-demographic factors are explored.

The atlas of geographies provides an insight in the socio-demographic factors of the neighbourhoods of Assen, through the cartogram's multiple patterns between socio-demographic factors can be observed.

It is concluded that; socio-demographic factors affect subjective well-being, income inequality has an effect on perceived safety and therefore affects SWB, and that socio-demographic factors furthermore affect the factors of education and unemployment that according to literature have an effect on subjective well-being.

University of Groningen

Course: **Bachelor project HGP GEBPROJHGP.2020-2021.2**
Supervisor: **Dimitris Ballas**

Student: **Laurens Brugma – S3422364**

Wordcount: **6,444**
Date: **10-06-2021**

Table of Contents

1 Introduction

This paper aims to explore the socio-demographic factors and the effect factors on well-being between neighbourhoods in Assen. Furthermore, there is a particular interest between economic inequality between areas and its effect on well-being. According to Sen (1992), many people are in favour of equality and in all social philosophical traditions, the importance of equality is emphasized. Most people are for example against societal tiers in which people economical position is predetermined at birth. However, in which way equality further should be reached differs. According to Smirzai (1997), a professorial fellow at the UNU-MERIT, the Netherlands, in particular, has an ethos of income levelling. This indicates that people restrain from increased income differences and are prone to keep differences of income level or to diminish those. Despite this ethos, the income inequality within the Netherlands has risen over the last decades (WRR, 2014). Simultaneously increasing amounts of Dutch citizens are of opinion that the differences in income should be diminished. In the beginning of the '90s this number was lowered to 50%, where after this number has risen to 70% in 2012 (figure 1). The research by Thomas et al. (2009) shows how increased inequality of regions can lead a diminished well-being of the inhabitants and require tailor made approaches.
The COVID-19 pandemic is assumed to increase the economic and social inequality within regions (Doets, 2020). It is furthermore projected that an increased amount of primarily well-off elders and high-income families will opt to live in the north of the Netherlands (Van den Berg & Van den Eerenbeemt, 2021; Geijp, 2020). The paper of the CBS (2021) shows a shift in relocation patterns of people from Amsterdam, Rotterdam, The Hague & Utrecht. These patterns show that an increased relocation outwards of the Randstad area, from 14.8% in 2015 to 21.6% in 2020. These new relocating patterns, of primarily people with high incomes, could lead to an increased inequality within the north of the Netherlands, including Assen and its neighbourhoods.
Inequality, and especially economic inequality, is according to Zagorski et al. (2014) the foundation of many social illnesses such as homicides, crimes, alcohol & drug abuse and short life expectancies. Furthermore, would high inequality lead to less social mobility and result in a higher tier of the 'The Great Gatsby Curve' introduced by Krueger (2012). The research by Thomas et al. (2009) explores the effects of inequalities within Sheffield, a city deprived by economic stagnation since the 1980's, to explain the processes in effect. The exploration of the region is primarily carried out by map visualizations to show the differences socio-demographic factors between regions. The socio-demographic factors are further explored by Agrawal et al. (2010) to find an effect between these factors and on SWB.
Because of the recent changes in moving behaviour caused by the COVID-19 pandemic, this paper focusses on the socio-demographics and the effects on well-being that can occur within the neighbourhoods.

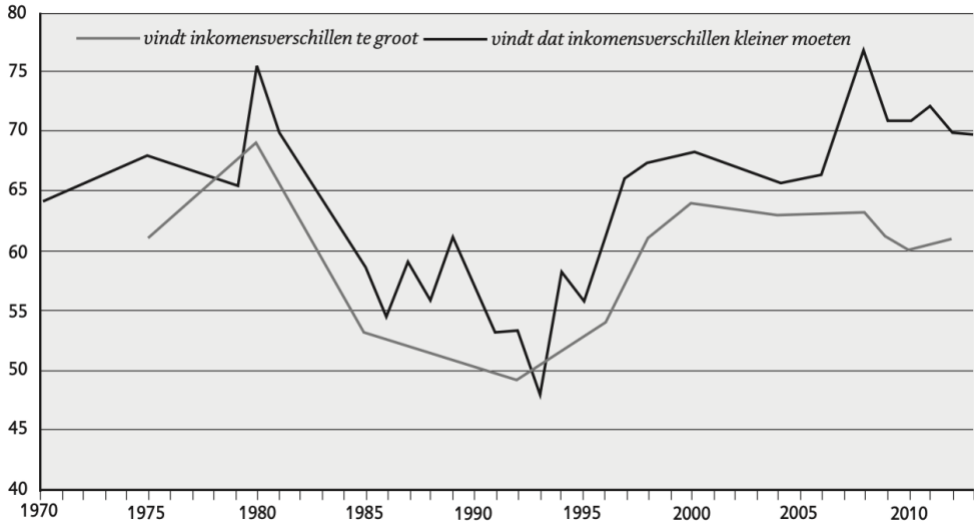

Figure 1: Conception about differences of income within the Netherlands, 1970-2012
Source: SCP (2013)

1.1 Research problem

This research aims to find out whether or not there is a relation between income inequality and subjective well-being within a neighbourhood. This paper focuses on the city of Assen, the Netherlands. The main question states: *'To what extent do socio-demographical factors affect the factors of subjective well-being and wider social well-being, in the city of Assen?'* To answer the main question, the paper aims to answer three sub-questions. The first question is stated: *'What are the socio-demographic factors of Assen?'*. Secondly; *'To what extent does income inequality affect factors of subjective well-being?'*. Finally; *'To what extent are the socio-demographic factors of low-education and unemployment explained by other socio-demographical factors?'*. The paper will conclude by taking the findings of the sub-question and the data of the main question into a concise answer.

1.2 Structure of the thesis

To answer the research problem the paper is structured in three parts. At first, the socio-demographical factors of the city of Assen are explored by GIS made cartograms. The main part of the paper focuses on the effects of income inequality and the factors of subjective well-being, which are tested through statistical analysis. This analysis is carried out with CBS data and KWIZ Survey data. Concluding, the explanatory power between socio-demographic factors and low-education and unemployment in Assen are explored through other statistical analyses, making use of exclusively CBS data. After the results of the analyses are presented, these results will be discussed and concluded. Within the appendices the syntaxes of the statistical analyses are included.

2 Theoretical framework

Many papers have been written about inequality and the effect of happiness on a global or national level. Furthermore, the relation of socio-demographic factors and well-being have been explored widely. Zagorski et al. (2013) have focussed on income inequality between European countries and their effect on life quality. Through variance-components multi-level models, it is concluded that income inequality should not lead to diminished subjective well-being (SWB) in advanced countries. This would be the result since well-being on a national level would be more dependent on national income than on income inequality. The paper of Oishi et al. (2011) however, discovered that inequality within the USA over time affects the happiness of its citizens. The paper concludes that Americans are in general happier in years where the national income is distributed more equally. McCann (2020) researches the inequality between regions of Great Britain and compares this inequality to other industrialized countries. It is concluded that Britain is one of the most inter-regional unequal countries. Thomas et al. (2009) conducted a research about inequality within Sheffield after the 1980's, the paper concludes that Sheffield is socially spatial divided and needs multiple area specific approaches.

Studies on inequality have a predominant focus on the neighbourhood scalar level. Most studies are conducted within North America and focus on the effects on health (Houa & Myles, 2005) or on accessibility of basic facilities (Namrata & Ray, 2016). The research of Collins & Guidry (2018) uses the scalar level of metropolitan areas of the U.S., in which the impact of inequality on the perception of safety is assessed. The paper discovered that inequality leads to decreased social engagement which results in a lower sense of safety. Safety is furthermore according to the pyramid of Maslow (1943) a basis for well-being, this makes perceived safety a requirement before other needs can be full-filled.

Since the neighbourhoods of the USA are stated to be highly segregated (Sampson, 2019), most of the inequality within neighbourhoods will arise when gentrification takes place. These neighbourhoods, primarily within the centre of the city, face according to Sampson (2019) simultaneously many other processes such as segregation and crime. These neighbourhoods are therefore hard to compare within the Dutch context, because of the Housing act implied since 1901. Housing Act art. 48 ensures that at least 90% of subsidized housing provided is offered to lower-income citizens (2021). This act has through the years ensured in a neighbourhood being less segregated by income (Veldboer & Bergstra, 2011), which makes neighbourhood comparisons between other countries with different socio-political views difficult.

The research by Drukker et. al (2004) focusses however on a European neighbourhood level, aiming at the effect of income inequality on the health-related quality of life. The research fails to find relation since the

neighbourhood level is suggested to be too small for large variations. According to Gjonça & Calderwood (2004), case studies and their data should be interpreted with their socio-demographic factors into consideration. These factors explain the context of the region of interest and how the results will be applicable in other regions. The research by Agrawal et al. (2010) focuses on the effect of socio-demographic factors and their effect on SWB. The application of socio-demographic factors can furthermore be seen in works of Zagorski et al. (2014), Thomas et. al (2009) and Drukker et. al (2004).
The papers written by Collins & Guidry (2018), Zagorski et al. (2013) & Drukker et. al (2004) have similarities in their method and aim to discover the effects of inequality. Collins & Guidry (2018) focus in their research on the effect of inequality on perceived safety within American metropolitan areas. Zargorski et al. (2013) aim to explain the effects of national inequality on overall well-being. Furthermore, Drukker et. al (2004) aims to explain, primarily health-related, quality of life on neighbourhood inequality figure.
The effects of inequality on factors of subjective well-being on a European neighbourhood scale have prior not been conducted.
The conceptual model (figure 2) is based on the literature from Collins & Guidry (2018), Sampson (2019), Zagorski et al. (2013) and Agrawel et al. (2010). It is assumed that income inequality has an individual effect on perceived safety and social cohesion and have a combined effect on SWB strengthened by income inequality. Furthermore, the socio-demographical factors of education level and work status have an independent effect on subjective well-being.

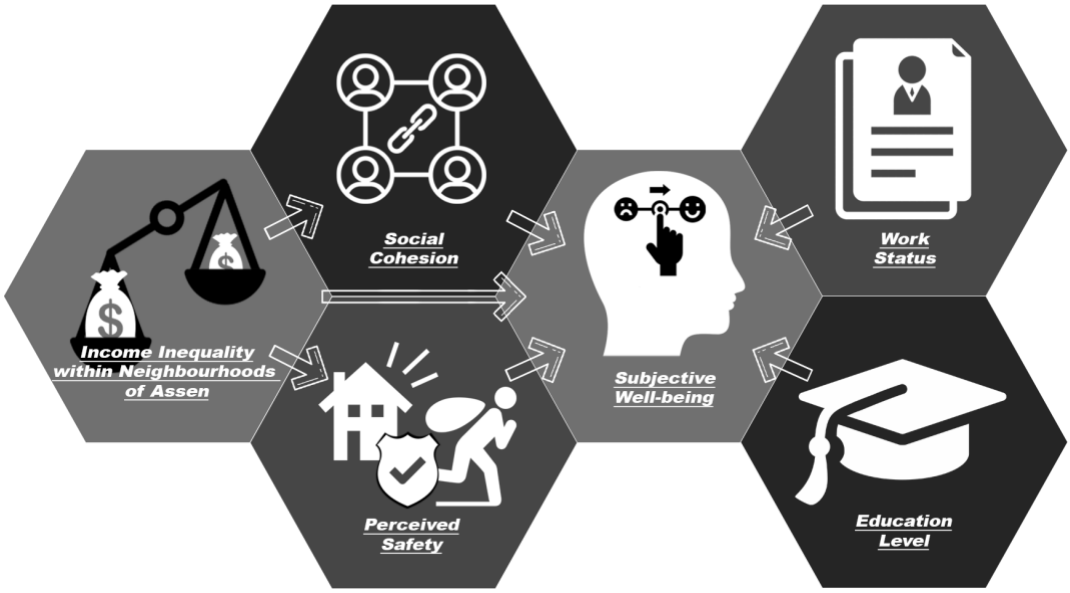

Figure 2: Conceptual Model

2.1 **Hypotheses**

For this paper, it is assumed that there is a correlation between wider social well-being, including subjective well-being (SWB) and income inequality within neighbourhoods. The null-hypothesis is stated therefore: H0; subjective well-being and wider well-being is not affected by socio-demographical factors. The alternative hypothesis is stated therefore, H1; subjective well-being and wider well-being is affected by socio-demographical factors. For the sub-questions it is furthermore expected that higher inequality results in less perceived safety. This would correspond with the research about safety and inequality across the European countries of Vauclair and Bratanova (2016). Furthermore, it is assumed that reduced equality leads to less social cohesion in accordance with Collins & Guidry (2018). It is not expected to face the same limitation as was mentioned in the paper of Drukker et al. (2004), where the neighbourhood level is found too small to find the impact of income inequality on the quality of life. This because the quality of life is largely based on health issues, and these issues go beyond the neighbourhood level, contrasting the concepts used in this paper; subjective well-being, perceived safety and social cohesion which are to a large extent determined on a neighbourhood level.

3 Methodology

3.1 Research design

This paper aims to explore the socio-demographic factors within neighbourhoods of Assen and find out how inequality within neighbourhoods affects subjective well-being. The neighbourhoods are defined on the scalar level of 'buurten' by the local authorities and are a widely used definition within the Netherlands. Data of both the Central Bureau for Statistics (CBS) and KWIZ are used for this research. The CBS data is selected since it provides objective information and excludes privacy sensitive information about the socio-demographic factors on the scalar level of 'buurten' of Assen. The data is published and freely accessible via their database. This CBS data is similarly used by Drukker et al. (2004) to identify economic deprivation and income inequality. The KWIZ data is commissioned by the municipality of Assen and is gathered over multiple years ending in 2009. KWIZ is specialised in gathering and analysing data within the social domain. The KWIZ data provides information containing the factors of subjective well-being.
The datasets provide information about socio-demographic factors and subjective well-being. The data of the CBS and KWIZ is presented by maps created by the use of Geographical Information Systems (GIS), created maps where after the data is analysed to answer the research questions.
At first the socio-demographic factors within the neighbourhoods of Assen are explored by using cartograms. Where after, the effect of income inequality on the factors of subjective well-being is analysed. The paper concludes with analysing the explanatory power of socio-demographic factors on low-education and unemployment.

3.2 Social Atlas of Geographies, neighbourhoods of Assen

To explore the socio-demographic factors in Assen contiguous cartograms are created. The socio-demographic factors are of interest since literature suggests that these will influence well-being (Agrawel et al., 2010). Cartograms are maps that use quantitative data to visualise certain characteristics of a particular area, while containing the original boundaries of an area (Nusrat & Kobourov, 2015). The area will be proportionally adjusted in size according to their socio-demographic factors. Cartograms enable the viewer to see the human geography of a region (Ballas et al., 2017). The cartograms are based on the data of two CBS datasets, '*Kerncijfers wijken en buurten 2017' and 'Opleidingsniveau-VSO 2017'.* The datasets date from 2017 since the data on education levels is exclusively available for this year. The CBS data is processed via a GIS to cartograms to visualise the socio-demographic factors, the colours of the neighbourhoods are maintained to recognize the individual neighbourhoods.

3.3 The effect of 'Income Inequality' on the factors of 'Subjective Well-being'

To analyse the effects of income inequality on subjective well-being (SWB) within the city of Assen, spatial data concerning income levels and SWB within Assen is required. The CBS dataset *'Kerncijfers wijken en buurten 2009'* contains data about spatial income levels. The data concerning the factors of SWB is from KWIZ and is published within a report of liveability within Assen. Both datasets date from 2009, this year is selected since it is the last year in which the liveability assessment of Assen was conducted by KWIZ.
The dataset of the CBS; *'Kerncijfers wijken en buurten 2009',* will form the basis for the calculations of income inequality. The calculations for income inequality will be carried out using a Gini index. According to Mueller et al. (1977) and Allison (1978) it is a powerful tool to analyse dispersion of perfect equality since it takes scale variances into consideration. Another method that can be considered is the 20/80 ratio, which takes the ratio between the lowest and highest 20% of incomes (CBS, 2018). The Gini index method is selected because of the availability and the format of the data. The calculation of the Gini is further explained within the chapter 'The variables of CBS & KWIZ data'.
The selected data from the spatial dataset is on the scalar level of 'buurten' and considers household income. Household income inequality is selected over personal income inequality, since the difference between households will have more effect within the neighbourhood. Personal incomes will include income differences within households, for example, a partner who takes care of the children and therefore works part-time or has no job.

The KWIZ report contains data about liveability within Assen on the scalar level of ‘wijken’. For the analysis it is therefore assumed that the data on the scalar level of ‘wijken’ is equal for the level of ‘buurten’. This paper focuses on the indicators of subjective well-being; perceived safety, social cohesion & perceived living environment. Within the KWIZ-report ‘leefbaarheidonderzoek’ this data is stated as: ‘onveiligheidsgevoelens’, ‘sociale samenhang’ and ‘gemiddeld rapportcijfer woon- en leefomgeving’ and will be treated as interval data.
The indicators for subjective well-being within this paper are perceived safety & social cohesion. Perceived safety has a large effect on well-being, according to Maslow (1943) safety is one of the lower needs before individuals can fulfil other needs. According to Marks et al. (2006), there is a strong relation between greater social capital and higher life satisfaction. Perceived living environment contains all factors on a neighbourhood level that influence SWB on a neighbourhood scale. Therefore, this data is a factor for subjective well-being within the neighbourhood.

3.4 The effect of socio-demographic factors on low-education and unemployment

To analyse the explanatory power of socio-demographic factors on education and unemployment affect SWB, a statistical analysis is carried out. The socio-demographic factors on education and work status are selected since this affects well-being. Education is stated to diminish distress and have a positive influence on SWB (Zagorski, 2014). According to Agrawel et al., (2010) is having no occupation a negative effect on SWB. An increase in hours of occupation would lead to a lower negative effect, a full-time employment would furthermore result in a positive effect on SWB. The factors about education and unemployment furthermore correspond with the factors used in the research of Thomas et al. (2009) in which they are used to explore the inequalities of the Sheffield region.
The analysis between the socio-demographic factors on education and work status is conducted by using two CBS data sets; ‘Kerncijfers wijken en buurten 2017’ & ‘Opleidingsniveau-VSO 2017’. The data contains information about the socio-demographic factors on the scalar level of ‘buurten’. Data about ‘low-education’ and ‘unemployment’ are analysed and are stated to have a negative effect on SWB. The analysis shows the effect of other socio-demographic factors on low-education and unemployment. The results are presented in a narrative on which socio-demographic factors effect low-income and unemployment.

4 Atlas of Social Geographies

cartograms of Assen

Assen is the capital city of the province Drenthe in the Netherlands. Assen is located north of the geographical centre of Drenthe, located in close proximity to the capital city of Groningen (figure 3). The city of Assen has developed itself comparatively late and has doubled its inhabitants in the last 50 years. In 2020 Assen consisted of 68,599 inhabitants. Socio-demographic factors give a clear indication about the inhabitants of a location (Gjonça & Calderwood, 2004). In their paper, they discuss the effects of socio-demographic factors on the outcome in sociological research. The writers state that it 'helps to create a larger picture about each respondent'. The paper of Agrawal et al. (2010) discusses the effect of socio-demographic factors on subjective well-being through an urban case study in India. Within this research, these socio-demographic factors are analysed on the neighbourhood scale. The socio-demographic factors of the neighbourhoods will be discussed and visualised using cartograms. The method used corresponds with the research by Ballas et al. (2017) to analyse the spatial poverty, austerity and inequality between countries in Europe. This chapter uses cartograms to answer the question; *'What are the socio-demographic factors of Assen'.* The factors of interest are age-group, education level, marital status, income, type of household and housing type.

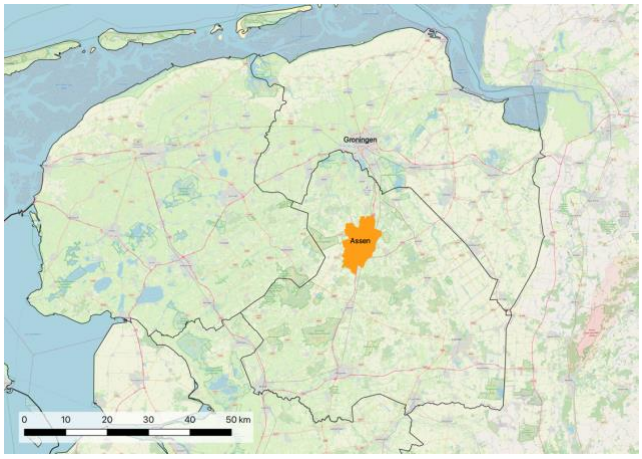

Figure 3: Geographical Location of Assen

4.1 Age Groups

Age has according to Agrawal et al. (2010) a significant effect on life satisfaction on men under the age of 36. The study furthermore states that the SWB from women over the age of 55 is negatively affected by their age. Within Assen, the age distribution of its inhabitants largely corresponds to the national average (figure 4). The percentages of inhabitants in the age group from 0 – 10 years old is above the national average. The group that includes inhabitants in the range of 20 – 30 years old are 2.5 % of the national average. The population pyramid further follows a pattern close to the average of The Netherlands.

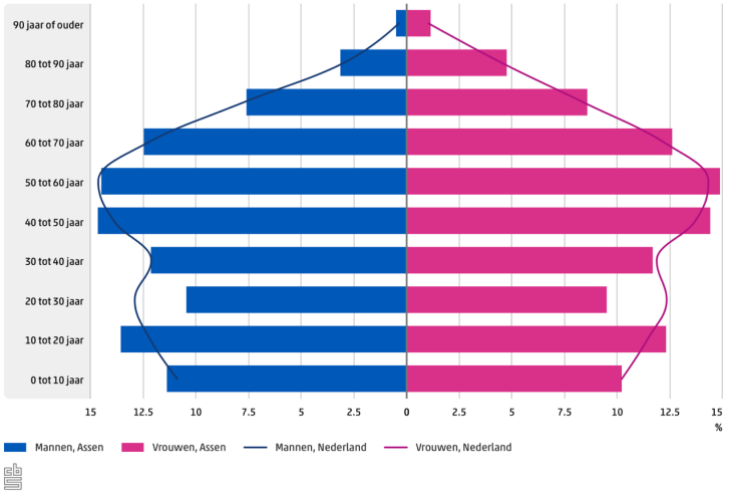

Figure 4: Population Pyramid of Assen
Source: CBS (2017)

On a neighbourhood scalar level, there are some spatial differences visible regarding the distribution of age groups throughout Assen (figure 5). People that are young of age live in the north-western of the city. The neighbourhood 'Kloosterveen' seems to be populated by 25 to 44 years old while having children in the age group of 0 – 14. The inhabitants of 65 years and older tend to live within or to the south and close to the city centre.

Figure 5: Cartogram of Age Group

4.2 Education Level

Education has according to Agrawal et al. (2010) not proven to affect SWB. Despite having no direct effect on SWB, education affects income and therefore could lead to inequalities within the neighbourhood. Within Assen, there seems to be a clear pattern in education level. The neighbourhoods 'Pittelo' and 'Noorderpark' have a high percentage low-educated people. The neighbourhoods 'Assen-centrum' and 'Kloosterveen' are inhabited by a relatively high amount of higher educated people.

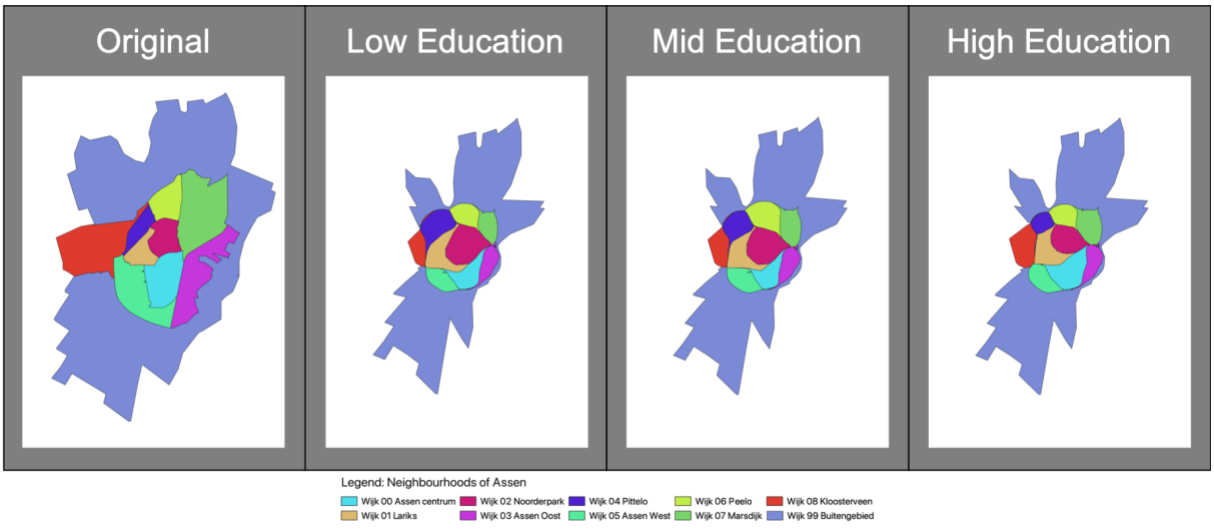

*Figure 6: Cartogram of Education**

*The level of education is measured in the population above 15 years old. 'Low education' indicates a highest achieved or an active position in the education level of; primary school, entry-level high school or 1st level of practical education. 'Mid education' indicates a highest achieved or an active position in the education level of; 2nd till 4th level of practical education or last classes in high school. 'High education' indicates the highest achieved or an active position in the education level of; university of applied sciences and all academic degrees within the university.

4.3 Marital Status

Marital status affects SWB, as being married has a positive effect on life satisfaction (Agrawal et al. 2010). Although marriage has become less predominant in western society, it is expected that it still a relevant factor about the inhabitants. Since some partners choose not to marry, the factor of 'type of household' will be analysed as well. The relatively high amount of widowed people in 'Lariks' and 'Assen centrum' can be explained by the age group that inhabit the neighbourhoods. Similar patterns can be drawn between married and the two age groups between 25 and 64 years old.

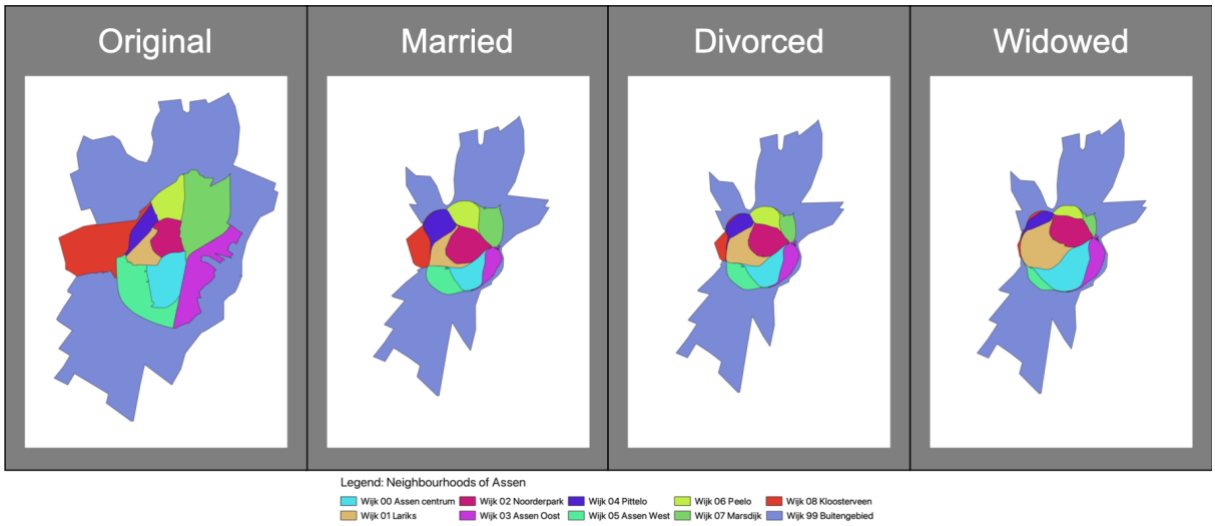

Figure 7: Cartogram of Marital Status

4.4 Type of Households

The type of household indicates how the households that are analysed live. This factor is therefore taken into consideration to be able to encounter the difference for the feeling of safety or necessity for social cohesion. As expected, within the cartogram of age groups there is indeed a high percentage of household with children in 'Kloosterveen'. It could furthermore be expected that there is a clear spatial relation between the percentage of widowed inhabitants and single-person households.

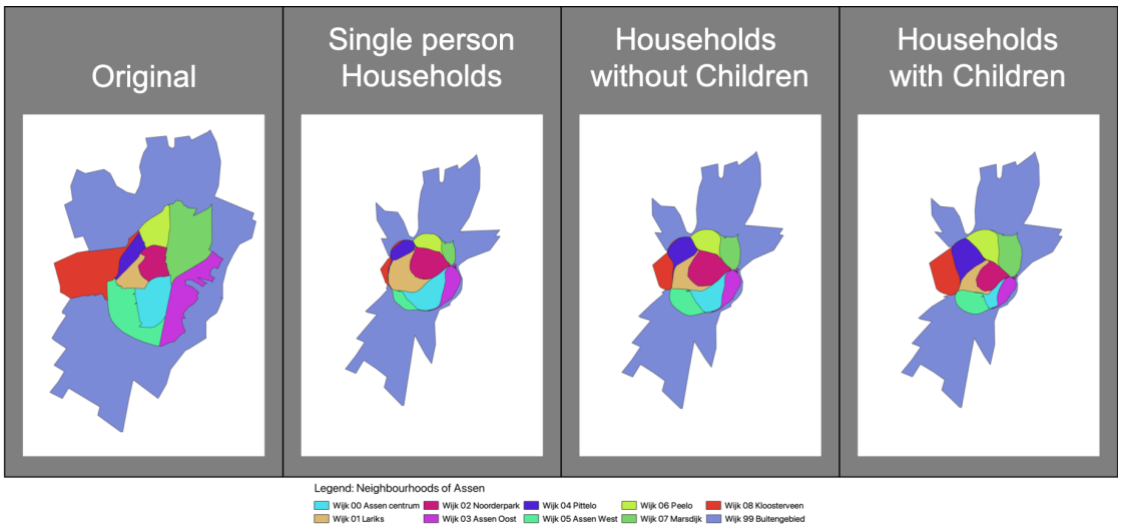

Figure 8: Cartogram of Type of Households

4.5 Income

Income has, according to Agrawal et al. (2010), an effect on SWB. People with a higher income tend to be more satisfied with life. The cartogram of Assen illustrates that the neighbourhood of 'Kloosterveen' in 2009 predominantly consists of household with high incomes. This can be explained by the fact the neighbourhood was in its first phase in which primarily large plots were sold. The inducement of the housing act (2021) will have its effect when the neighbourhood will be finalized.

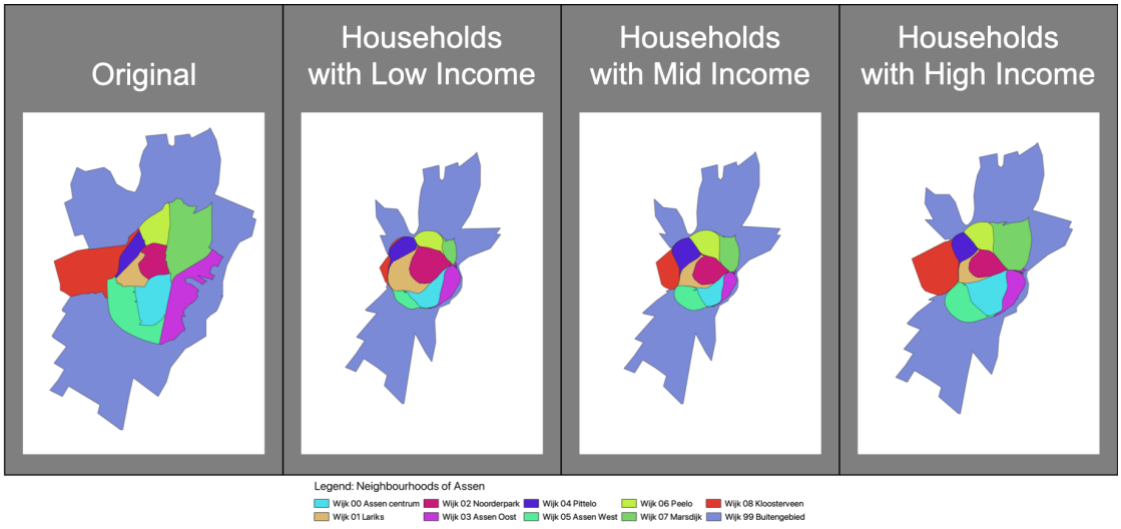

Figure 9: Cartogram of Household Income

4.6 Housing type

The type of housing an inhabitant lives in implies the financial situation of a person. Data containing this information can furthermore explain ratings about factors of SWB. Figure 10 illustrates that Assen has a relatively high number of owner-occupied houses. A similar pattern within the neighbourhood of 'Kloosterveen' as on income can be seen and can similarly be accounted for due to the first phase of the neighbourhood.

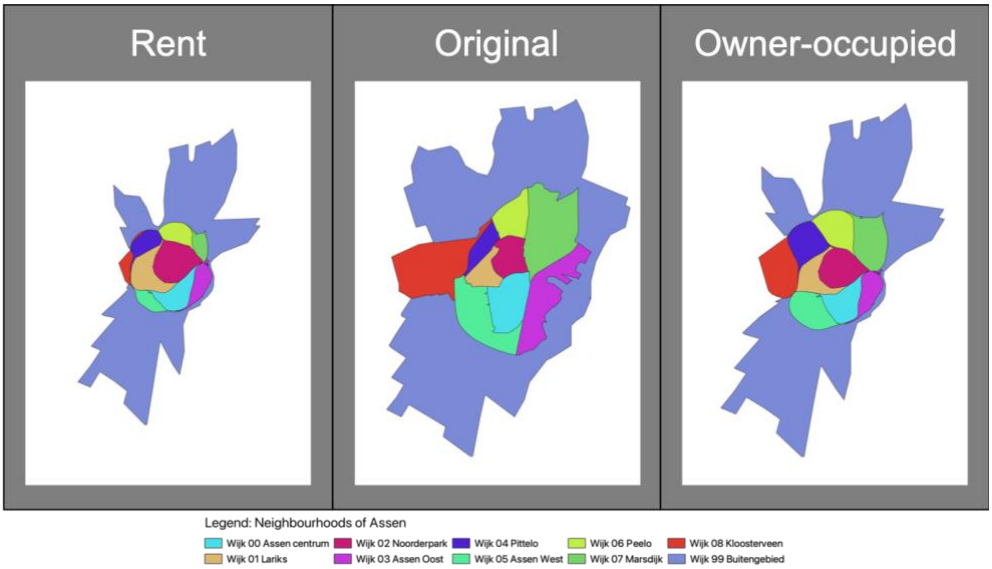

Figure 10: Cartogram of Housing Type

4.7 Unemployment

Unemployment has a negative impact on SWB (Agrawel et al., 2010). The cartogram (figure 11) resembles much of the cartograms about rental housing and low-income. There are some familiarities between the cartograms of unemployment and single-person households, however the neighbourhood of ‘Pittelo’ does not follow this trend.

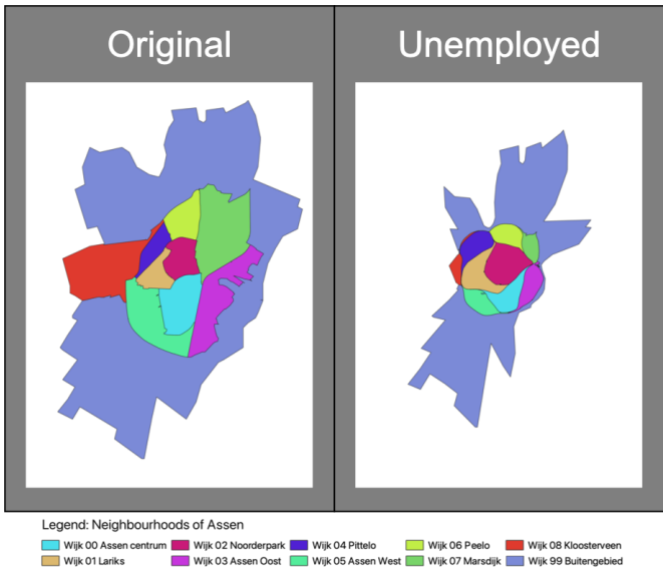

Figure 11: Cartogram of Unemployment

5 The effect of 'Income Inequality' on the factors of 'Subjective Well-being'

5.1 The variables of CBS & KWIZ data

Explanation, calculation & analysis

The dataset of the CBS 'buurtkaart met Cijfers' contains spatial income levels of Assen in 2009. The CBS data is used to draw a Lorenz curve and to calculate the Gini index.
The dataset contains income data per 'buurt' as an average and a percentage of households belonging to three predefined income groups. These fixed groups are based on national income levels; the lowest 40% and the highest 20% income. The 'middle group' is not quantified, The middle group however results from the gap between the lowest 40% and the highest 20% of national incomes. This can for example lead to a neighbourhood of which 19% of its inhabitants belong to the lowest 40% group and 2% to the highest 20% group. This results in 79% of neighbourhood inhabitants belonging to the national middle group.
To estimate the total income for each of the three groups, the *number of households* has to be multiplied by the *average household income group income*. The *average household income group income* is stated by the CBS in the report of 'Welvaart in Nederland' states the average income per 10% income groups for 2010. The data of 2010 therefore needs to be corrected by data of 'Besteedbaar en gestandaardiseerd inkomen van huishoudens in lopende prijzen en in prijzen van 2010' to correct for the incomes of 2009. An overview is given within table 1.

Variable	Calculation
% of households with Mid Income	100 – "% Low Inc." – "% High Inc."
Estimated Income Group 'Low'	15.9 * "% Low Income" * "# of Households")
Estimated Income Group 'High'	114 * "% Mid Income" * "# of Households")
Estimated Income Group 'Mid'	56.95 * "% High Income" * "# of Households")
Estimated Income Group 'Total'	"Est. Inc. Low" + "Est. Inc. Mid" + "Est. Inc. High"
Share of Income Group 'Low'	"Est. Inc. Low" / "Est. Total Inc."
Share of Income Group 'High'	"Est. Inc. Mid" / "Est. Total Inc."
Share of Income Group 'Mid'	"Est. Inc. High" / "Est. Total Inc."

Table 1: Calculation of Variables

The Lorenz curve is drawn by plotting the proportion of income per income class. The Lorenz curve indicates the accumulation of income (y-axis) over the total population (x-axis). The curve illustrates the proportion of income that is generated by a percentage of households of the neighbourhood. The area between the equality line and the Lorenz-curve indicates the dispersion from complete equality. This area, the inequality gap (figure 12), can be calculated and leads to the Gini index.

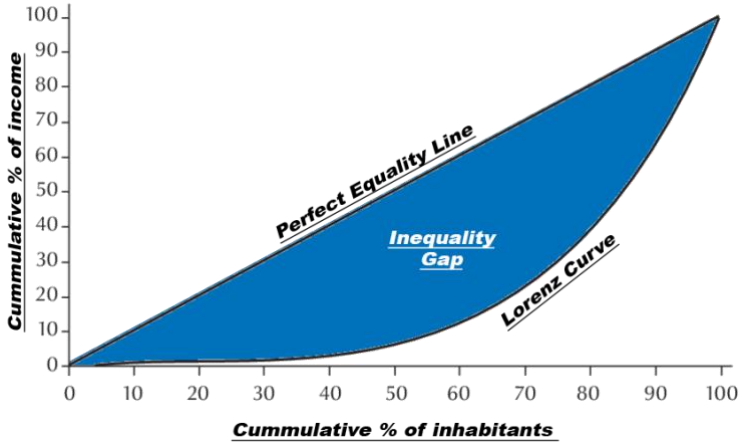

Figure 12: Explanation of Lorenz-curve

The Lorenz curves are drawn for the neighbourhoods of Assen and are based on the three points of the incomes groups along which the curve is drawn (figure 13).

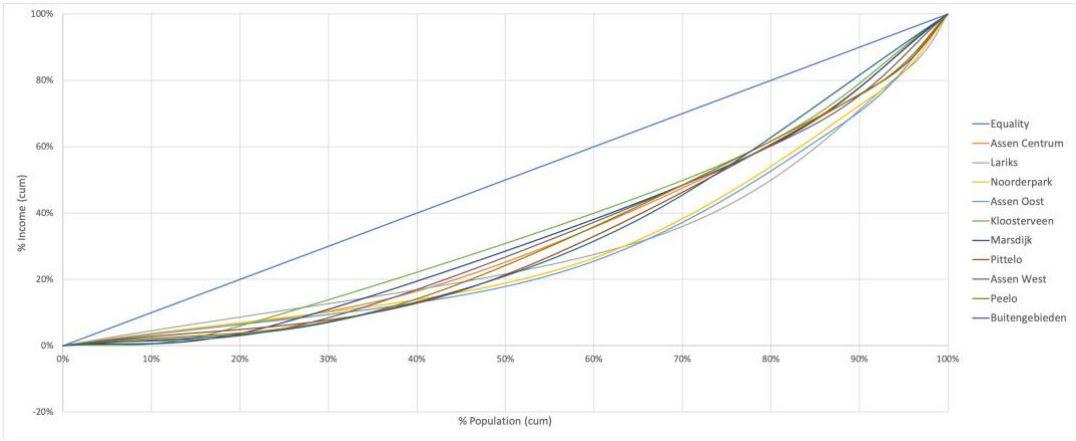

Figure 13: Lorenz-curve of income, Neighbourhoods of Assen

For each neighbourhood within Assen, the inequality gap is calculated and results in individual Gini indexes. The range of the Gini index also ranges from 0 – 1, where 0 indicates perfect equality and 1 indicates complete inequality. The national Gini index of the Netherlands was in 2009 stated on 0,272 (CBS, 2017). The indexes on the scalar level of 'buurten' are used within regression methods to analyse their effect on factors of subjective well-being.

The KWIZ data contains survey perception data concerning safety, social cohesion and living environment of the inhabitants within Assen and is provided on a Likert scale.

The two datasets result in variables about inequality and factors of subjective well-being an overview is given in table 2.

Data*	Source	Aim
% of households within Low Income	CBS	Neighbourhood Income Inequality
% of households within High Income	CBS	Neighbourhood Income Inequality
% of households within Middle Income	Calculated	Neighbourhood Income Inequality
# of households with Income	CBS	Neighbourhood Income Inequality
Average Income per Income group	CBS	Neighbourhood Income Inequality
Estimated Income per Income group	Calculated	Neighbourhood Income Inequality
Share of Total Income per Income group	Calculated	Neighbourhood Income Inequality
Gini index per Neighbourhood	Calculated	Neighbourhood Income Inequality
Rating of Social Cohesion	KWIZ	Factors of Subjective Well-Being
Rating of Perceived Safety	KWIZ	Factors of Subjective Well-Being
Rating of Living Environment	KWIZ	Factors of Subjective Well-Being

*on the neighbourhood level

Table 2: Overview of Variables

The individual factors of well-being will be individually analysed through simple linear regression (SLR). This regression shows if and how strong the relation between inequality and perceived safety, social cohesion or liveability are. The factors are assessed on an individual scale since there is a high probability that the explanatory power of each factor overlap. By measurements through regression, the relation between inequality and perceived safety, social cohesion and liveability will be conducted. This correlation test will show whether or not there is a relation between inequality and the given variables.

An overview about analysis of the data is presented within a scheme (figure 14).

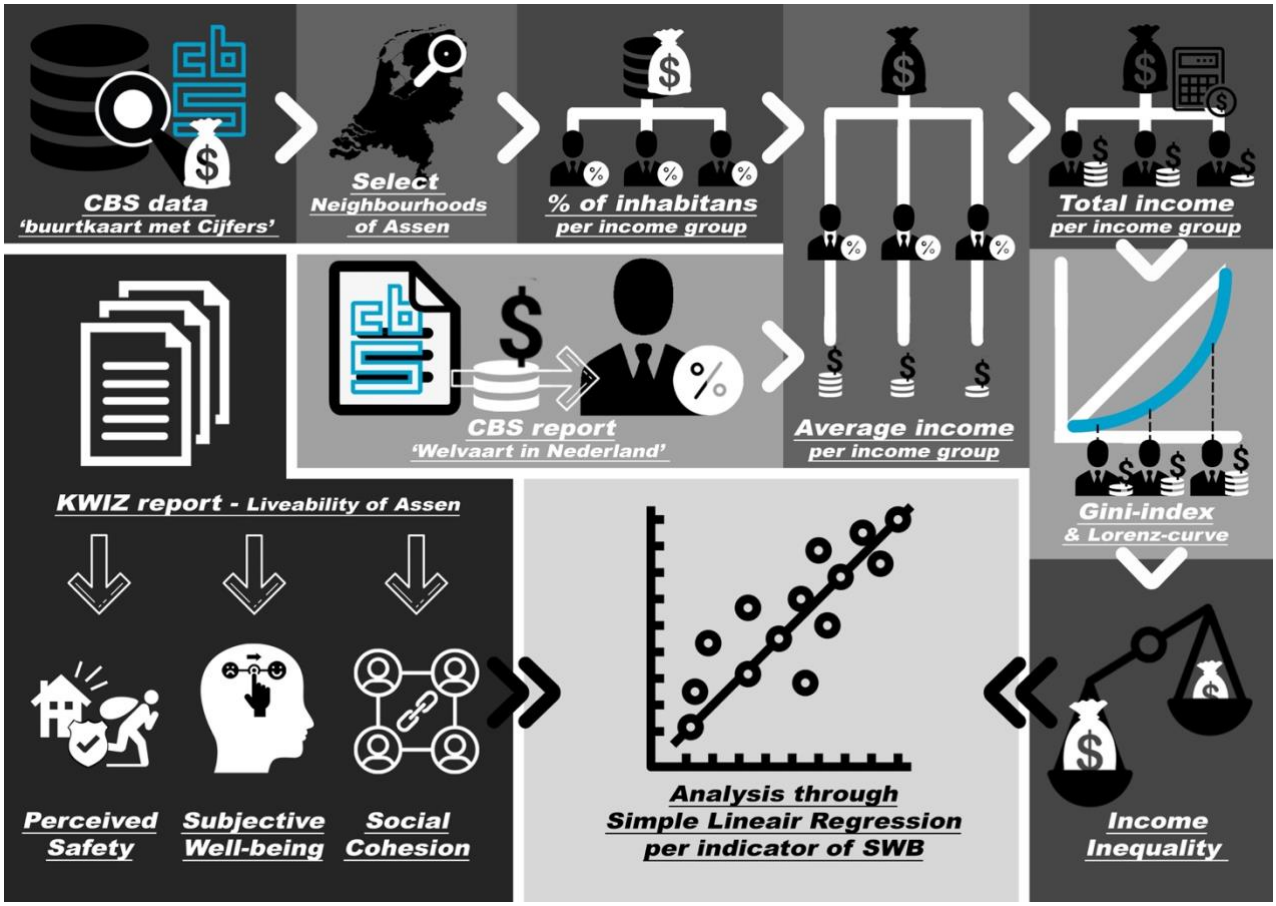

Figure 14: Data Analysis Scheme

5.2 Analysis

Within the Netherlands, there are two types of areas that can be accounted for as neighbourhoods, namely ‘wijken’ and ‘buurten’ (figure 15). ‘Wijken’ are the largest and are distinctively visible in cities. ‘Buurten’ are smaller segments of a ‘wijk’ and differ from each other in function and types of housing. This could result in an industrial part of a ‘wijk’ being a separate ‘buurt’. It could furthermore lead to large differences between the percentages of social housing between ‘buurten’ within the same ‘wijk’. Because of these distinctive differences between ‘buurten’ that will be evened out by the scalar level of ‘wijken’, this paper will analyse on the ‘buurten’ level.

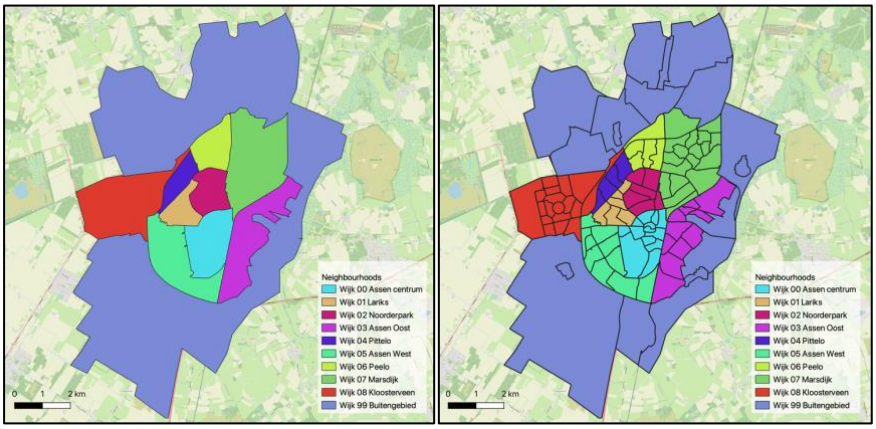

Figure 15: The scalar level of ‘wijken’ (left) and ‘buurten (right) of Assen

5.2.1 KWIZ-data

The KWIZ-data used for the analysis of this paper about factors of well-being is about; perceived safety, social cohesion & living environment. The KWIZ-data between the factors shows some locational patterns (figure 16).

The KWIZ-data is gathered evenly throughout the Assen, the data is however published on the scalar level of ‘wijken’. Therefore, the data containing the averages from the factors of well-being are distributed to the ‘buurten’ belonging to the particular ‘wijk’.

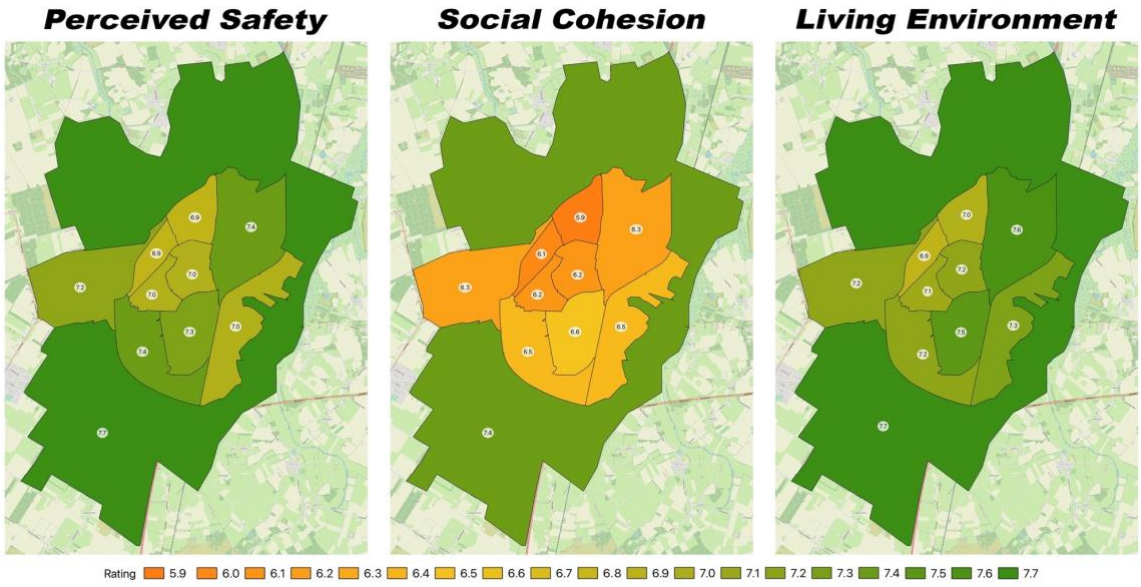

Figure 16: Spatial results of the KWIZ-survey on the factors of Subjective Well-being

5.2.2 Gini indexes

Income inequality can be quantified by a Gini index. The calculation method to calculate the Gini indexes from CBS data is explained prior in the chapter 'The variables of CBS & KWIZ data'. The higher the Gini index, the more income inequality within the neighbourhood. The scalar level of 'wijken' spreads out differences leading to a more even distribution as can be seen in figure 17. The Gini index is therefore analysed on the scalar level of 'buurten', to get better accuracy and to increase the number of cases. Of some 'buurten' there is no data registered (unspecified) by the CBS since some 'buurten' are too scarcely populated. It can furthermore be seen that within the city of Assen there are clear spatial inequality differences between particular areas. The Gini indexes of each area is tested against the factors of SWB using a regression analysis.

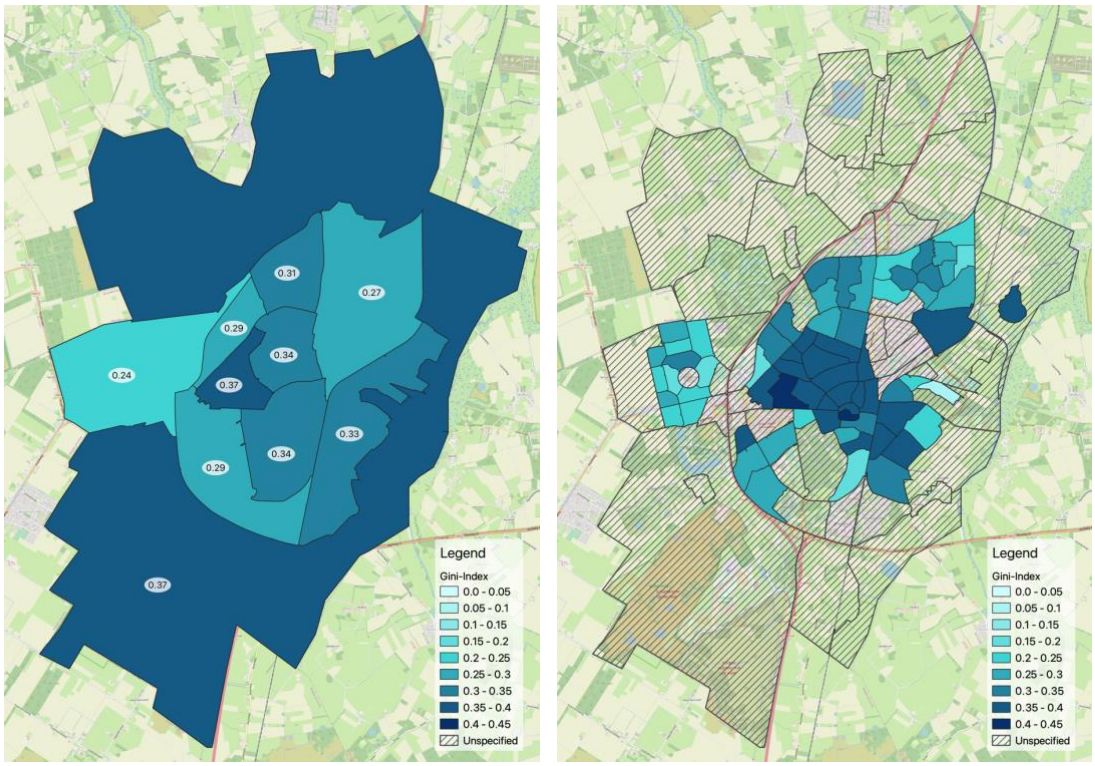

Figure 17: Spatial Gini indexes in the city of Assen

5.2.3 Regression

To find out to what extent income inequality affects factors of subjective well-being a regression is conducted between the Gini indexes and data of KWIZ. The regression is carried out through a statistical software programme (figure 18). According to the literature studied in the theoretical framework, the factors of SWB have explanatory power on the other factors of SWB. Therefore, this paper takes a regression of each factor against the Gini index of a neighbourhood. At first income inequality is tested against perceived safety. Where after social cohesion is tested similarly. Concludingly a regression between income inequality and the perceived living environment is conducted.

Additional socio-demographic factors within a model leads to a better explanation. Therefore, a multiple linear regression is conducted to further analyse the effect of income inequality on the factors of subjective well-being. These additional factors need to have intuitive explanatory power over the model. Can for example be explained that social cohesion is affected by the % of household with a high income or with children? Or that perceived safety can be explained by factors such as age, marital status and income?

5.3 Results

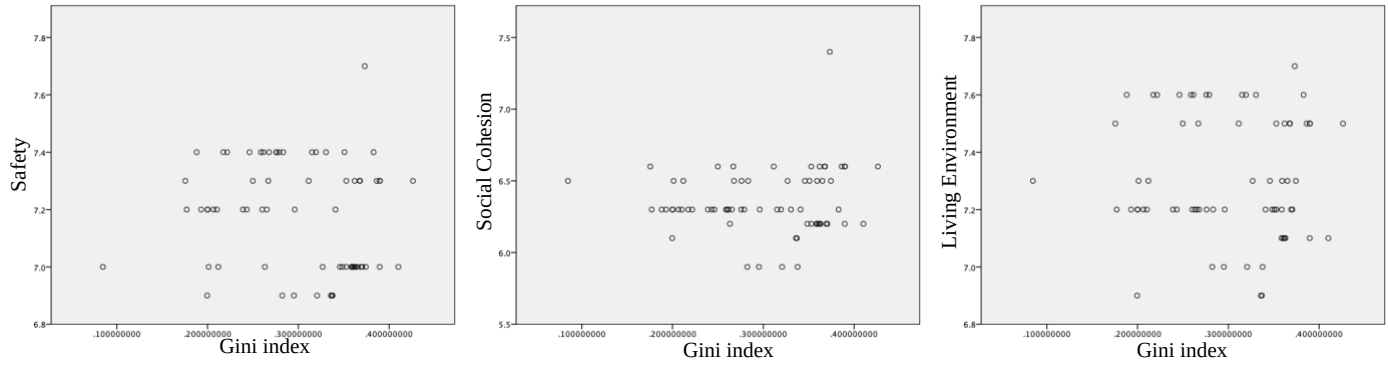

Figure 18: graphs of regression between the factors of SWB and Income Inequality

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95.0% Confidence Interval for B L. Bound	95.0% Confidence Interval for B U. Bound
1	(Constant)	7.270	.099		73.207	.000	7.071	7.468
	Gini	-.290	.322	-.110	-.902	.370	-.933	.352

a. Dependent Variable: Safety

Coefficients[b]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95.0% Confidence Interval for B L. Bound	95.0% Confidence Interval for B U. Bound
1	(Constant)	6.266	.119		52.754	.000	6.028	6.503
	Gini	.296	.385	.094	.770	.444	-.472	1.065

b. Dependent Variable: Social Cohesion

Coefficients[c]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95.0% Confidence Interval for B L. Bound	95.0% Confidence Interval for B U. Bound
1	(Constant)	7.316	.112		65.594	.000	7.093	7.539
	Gini	-.024	.361	-.008	-.068	.946	-.746	.697

c. Dependent Variable: Living Environment

Figure 19: models of regression between the factors of SWB and Income Inequality

The regressions (figure 19) regarding the effect of income inequality on factors of SWB turn out to be not significant. The Gini index does in the model not seem to affect the dependent variables of safety, social cohesion nor the living environment. It can therefore be concluded that the Gini index on itself does not have enough explanatory power to predict the factors of SWB within the model. By adding variables such as socio-demographic factors the model gains explanatory power. These socio-demographic were prior explored within the atlas of geographies.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.753	10	.075	2.577	.012[b]
	Residual	1.666	57	.029		
	Total	2.419	67			

a. Dependent Variable: SAFETY

b. Predictors: (Constant), P_HighInc_HH, P_65_EO_JR, P_45_64_JR, P_15_24_JR, P_DIVORCED, GINI_INDEX, P_UNMARRIED, P_LowInc_HH, P_00_14_JR, P_25_44_JR

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	2.092	3.801		.550	.584
	GINI_INDEX	2.031	.688	.772	2.950	.005
	P_00_14_JR	5.168	3.870	2.369	1.335	.187
	P_15_24_JR	5.059	4.262	.917	1.187	.240
	P_25_44_JR	5.682	3.898	2.792	1.458	.150
	P_45_64_JR	4.759	3.664	1.831	1.299	.199
	P_65_EO_JR	4.446	3.819	3.159	1.164	.249
	P_UNMARRIED	-1.233	.714	-.638	-1.726	.090
	P_DIVORCED	1.543	1.168	.281	1.321	.192
	P_LowInc_HH	-.576	.304	-.658	-1.891	.064
	P_HighInc_HH	.370	.233	.327	1.590	.117

a. Dependent Variable: SAFETY

Figure 20: model of multiple linear regression on perceived safety

The model (figure 20) on safety provides is significant and furthermore is significant for the Gini. The model shows a positive coefficient between safety and Gini. This implies that an increase of the Gini would result in increased perceived safety.

ANOVA[c]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.878	3	.293	7.290	.000[d]
	Residual	2.570	64	.040		
	Total	3.449	67			

c. Dependent Variable: SOCIAL_COHESION

d. Predictors: (Constant), P_HighInc_HH, P_HH_W_Child, GINI_INDEX

Coefficients[c]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	6.067	.233		26.067	.000
	GINI_INDEX	.948	.554	.302	1.711	.092
	P_HH_W_Child	-.425	.177	-.334	-2.400	.019
	P_HighInc_HH	.800	.206	.592	3.885	.000

c. Dependent Variable: SOCIAL_COHESION

Figure 21: model of multiple linear regression on social cohesion

For social cohesion (figure 21), the model is fully significant. The Gini index is however not significant, it can therefore be not concluded that Gini affects perceived social cohesion.

ANOVA[e]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.721	8	.090	2.317	.031[f]
	Residual	2.294	59	.039		
	Total	3.015	67			

e. Dependent Variable: LIVING_ENVIRONMENT

f. Predictors: (Constant), P_LowInc_HH, P_25_44_JR, P_HH_WO_Child, P_45_64_JR, P_Rental_House, GINI_INDEX, P_65_EO_JR, P_Own_House

Coefficients[e]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	12.747	3.872		3.292	.002
	GINI_INDEX	1.267	.760	.431	1.668	.101
	P_25_44_JR	1.194	.807	.526	1.480	.144
	P_45_64_JR	1.532	.743	.528	2.062	.044
	P_65_EO_JR	1.014	.480	.645	2.110	.039
	P_HH_WO_Child	-.908	.488	-.365	-1.862	.068
	P_Own_House	-6.157	3.813	-7.276	-1.615	.112
	P_Rental_House	-6.173	3.811	-7.279	-1.620	.111
	P_LowInc_HH	-.801	.357	-.820	-2.242	.029

e. Dependent Variable: LIVING_ENVIRONMENT

Figure 22: model of multiple linear regression on living environment

For living Environment (figure 22), the model is fully significant. The Gini index is not significant and it can therefore be concluded that Gini does not affect the perceived living environment.

6 The effects of socio-demographic factors on low-education and unemployment

Socio-demographic factors explain the context of the inhabitants of a region, they can furthermore be used to make explain the other factors. Within the atlas of social geographies of this paper some particular spatial patterns between socio-demographic factors can be recognized. The atlas of social geographies furthermore shows varying ratios within neighbourhoods of Assen of people that are 'low-educated' or 'unemployed'. This chapter analyses the explanatory power of these socio-demographic factors through statistical regressions. The results are presented within a narrative, to answer the question; *'To what extent are the socio-demographic factors of low-education and unemployment explained by other socio-demographical factors?'.*

The percentage of people with low-education within a 'buurt' caters positively for a high probability for the 'buurt' to consist of social rent housing. This corresponds with the housing act (2021) which should provide at least 90% of subsidized housing for lower incomes. Low education has furthermore a positive effect on the percentage of household with or without children and has a negative effect on single-person households. It is therefore assumed low-educated people tend to form a household quicker. Furthermore, low-education has a positive effect on the percentage of inhabitants that are divorced. The socio-demographic factors of age turn out that to have no explanatory power over the percentage of low-education within a 'buurt'. This can be explained by the age cohort of the data sample that is taken of people between 15 and 74 years old. The socio-demographic factor of being unemployed (non-active), would according the cartograms (figure 6 & 11) intuitively lead to the impression that there is a relation to low-education. However, regression analysis shows that there is no explanatory effect on the percentage of low-educated people.

The percentage of unemployed people within a 'buurt' is explained by the age groups of its inhabitants. The ratio of people between 15 and 24 or above 65 has a negative power on this percentage. This is explained by the sampling method in which a large group is not yet, or not anymore, valued to be 'workforce'. The percentage of people between 25 and 64 has a positive relation towards unemployment percentage. Further positive relations have been established on the percentages of households that are considered to be single person, widower or with children. Additional negative relations on unemployment result from the percentages of inhabitants that are married, live in social rent houses or have low incomes. The percentage of low-education has no explanatory power on unemployment, similarly to unemployment on low-education.

Concludingly, the percentage of; social rent housing, low-income, marital status, and type of household within a neighbourhood holds large explanatory power on low-education and unemployment. Low-income has a negative effect on unemployment, however it holds a positive relation towards low-education. The relation between low-education and income is intuitive, the relation between unemployment and low-income suggests that unemployment can be achieved by a household that has sufficient funds. According to the data, it is furthermore expected that this unemployed person is more likely to be a widow, between 25 and 64 years old, has children and lives in owner occupied house. A person with low-education is more likely to have a low income, to be divorced and have a child or to be unmarried and form a household without a child.

Model Summary[a]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.826[b]	.682	.667	.050310426600000

b. Predictors: (Constant), P_NotActive, P_SocRent_House, P_LowInc_P

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.353	3	.118	46.486	.000[b]
	Residual	.165	65	.003		
	Total	.518	68			

a. Dependent Variable: P_Low_Edu

b. Predictors: (Constant), P_NotActive, P_SocRent_House, P_LowInc_P

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.103	.081		-1.265	.210
	P_SocRent_House	.001	.000	.327	3.047	.003
	P_LowInc_P	.007	.001	.614	5.108	.000
	P_NotActive	.001	.001	.123	1.432	.157

Model Summary[c]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.863[d]	.745	.728	.044989913300000

d. Predictors: (Constant), P_LowInc_HH, P_HH_WO_Child, P_DIVORCED, P_HH_W_Child

ANOVA[c]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.349	4	.087	43.070	.000[d]
	Residual	.119	59	.002		
	Total	.468	63			

c. Dependent Variable: P_Low_Edu

d. Predictors: (Constant), P_LowInc_HH, P_HH_WO_Child, P_DIVORCED, P_HH_W_Child

Coefficients[c]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	-.335	.104		-3.241	.002
	P_DIVORCED	.004	.003	.190	1.535	.130
	P_HH_WO_Child	.005	.001	.528	3.514	.001
	P_HH_W_Child	.005	.001	1.028	5.493	.000
	P_LowInc_HH	.006	.001	1.570	8.188	.000

c. Dependent Variable: P_Low_Edu

Model Summary[e]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.837[f]	.700	.682	.050043468500000

f. Predictors: (Constant), P_SINGLE_P_HH, P_UNMARRIED, P_LowInc_P, P_DIVORCED

ANOVA[e]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.381	4	.095	37.992	.000[f]
	Residual	.163	65	.003		
	Total	.543	69			

e. Dependent Variable: P_Low_Edu

f. Predictors: (Constant), P_SINGLE_P_HH, P_UNMARRIED, P_LowInc_P, P_DIVORCED

Coefficients[e]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	-.141	.037		-3.792	.000
	P_UNMARRIED	.001	.001	.163	2.362	.021
	P_DIVORCED	.009	.003	.385	3.269	.002
	P_LowInc_P	.008	.001	.682	7.684	.000
	P_SINGLE_P_HH	-.001	.001	-.241	-1.989	.049

e. Dependent Variable: P_Low_Edu

Figure 23: Regression 'percentage of low education' against socio-demographic factors

Model Summary[g]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.942[h]	.888	.876	2.986

h. Predictors: (Constant), P_LowInc_HH, P_15_24_JR, P_25_44_JR, P_45_64_JR, P_WIDOWED, P_65_EO_JR

ANOVA[g]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4091.701	6	681.950	76.481	.000[h]
	Residual	517.161	58	8.917		
	Total	4608.862	64			

g. Dependent Variable: P_NotActive

h. Predictors: (Constant), P_LowInc_HH, P_15_24_JR, P_25_44_JR, P_45_64_JR, P_WIDOWED, P_65_EO_JR

Coefficients[g]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	54.813	9.064		6.048	.000
	P_15_24_JR	-1.063	.239	-.362	-4.451	.000
	P_25_44_JR	.693	.174	.648	3.980	.000
	P_45_64_JR	.503	.128	.402	3.931	.000
	P_65_EO_JR	-.618	.133	-.965	-4.629	.000
	P_WIDOWED	1.138	.230	.674	4.954	.000
	P_LowInc_HH	-.292	.032	-.751	-9.110	.000

g. Dependent Variable: P_NotActive

Model Summary[i]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.861[j]	.741	.729	4.420

j. Predictors: (Constant), P_LowInc_HH, P_HH_W_Child, P_SINGLE_P_HH

ANOVA[i]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3417.310	3	1139.103	58.315	.000[j]
	Residual	1191.552	61	19.534		
	Total	4608.862	64			

i. Dependent Variable: P_NotActive

j. Predictors: (Constant), P_LowInc_HH, P_HH_W_Child, P_SINGLE_P_HH

Coefficients[i]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	28.191	4.438		6.352	.000
	P_HH_W_Child	.597	.066	1.224	9.046	.000
	P_SINGLE_P_HH	.556	.120	1.178	4.639	.000
	P_LowInc_HH	-.325	.073	-.838	-4.481	.000

i. Dependent Variable: P_NotActive

Model Summary[k]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.853[l]	.727	.715	4.766

l. Predictors: (Constant), P_MARRIED, P_HH_W_Child, P_SocRent_House

ANOVA[k]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3992.335	3	1330.778	58.592	.000[l]
	Residual	1499.036	66	22.713		
	Total	5491.371	69			

k. Dependent Variable: P_NotActive

l. Predictors: (Constant), P_MARRIED, P_HH_W_Child, P_SocRent_House

Coefficients[k]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	60.176	3.590		16.764	.000
	P_HH_W_Child	.374	.035	.729	10.751	.000
	P_SocRent_House	-.144	.030	-.393	-4.760	.000
	P_MARRIED	-.325	.070	-.368	-4.617	.000

k. Dependent Variable: P_NotActive

Model Summary[m]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.865[n]	.749	.734	4.604

n. Predictors: (Constant), P_Own_House, P_HH_W_Child, P_MARRIED, P_SocRent_House

ANOVA[m]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4113.500	4	1028.375	48.513	.000[n]
	Residual	1377.871	65	21.198		
	Total	5491.371	69			

m. Dependent Variable: P_NotActive

n. Predictors: (Constant), P_Own_House, P_HH_W_Child, P_MARRIED, P_SocRent_House

Coefficients[m]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	58.436	3.543		16.491	.000
	P_HH_W_Child	.312	.042	.610	7.384	.000
	P_SocRent_House	-.082	.039	-.224	-2.097	.040
	P_MARRIED	-.457	.088	-.518	-5.217	.000
	P_Own_House	.126	.053	.371	2.391	.020

m. Dependent Variable: P_NotActive

Figure 24: Regression 'percentage of unemployment' against socio-demographic factors

7 Discussion

The social atlas of geographies has provided an overview about the socio-demographic factors within the 'wijken' of Assen. The cartograms are created by GIS and provides context about the areas of interest. For this research it helped to better understand and to visualise the human geography as was stated within the paper of Ballas et al., (2017).

According to literature it was expected that increased income inequality would lead to reduced safety and social cohesion (Vauclair and Bratanova, 2016; Collins & Guidry, 2018). The results on safety however contrast this, within the model, safety is positively influenced by the Gini index. This corresponds with the paper by Veldboer & Bergstra (2011) where it is stated that diversification increases the neighbourhood trust. This is diversification of the neighbourhood is further accommodated by the housing act (2021).

Another critique is that the city of Assen could be too small, a larger city as a case study will intuitively lead to bigger differences between neighbourhoods. It will cater bigger wage gaps and would therefore lead to bigger differences between Gini indexes of neighbourhoods. Furthermore, the size of Assen would lead to small differences in subjective well-being since qualities and amenities may overlap. This issue corresponds with the problem faced by Drukker et al. (2004), where the differences between neighbourhoods are too small to find a relation between inequality and health.

Despite making use of CBS data, the Gini indexes would be more precise when raw data about household income is applied. Furthermore, raw data removes the necessity for average income per income group to estimate the total incomes. This would lead to income data that is more precise and therefore would result in a more accurate Gini index.

The data of KWIZ concerning the factors of SWB show small variances and is on the 'wijken' scalar level. A new survey on the scalar level of 'buurten' will provide better insight for the city itself and will furthermore lead to be of more use for an accurate analysis.

Socio-demographic factors are capable of explaining factors that are known to affect SWB (Agrawel et al., 2010) and have provided new insights at the scalar level of 'buurten'. A more detailed study on unemployment would be relevant since literature suggests that it negatively affects SWB, however data suggests that particular inhabitants opt to be unemployed. Furthermore, research could progress on this research question by using data of the factors of SWB on the 'buurten' level. Or by taking the Gini and SWB data on a larger scalar level: using the Netherlands as a case study rather than focussing on one city.

8 Conclusions

The case study about the city of Assen firstly explores the spatial differences socio-demographic factors. Where after the relation between income inequality and the factors of subjective well-being (SWB) is discussed. Finally, the effects of socio-demographic factors on low-education and unemployment are explored.

The socio-demographic factors provide context of the city for the case study. The cartograms are on the neighbourhood scale and give spatial insights into which factors play a role within the areas. To answer the first research question; *'What are the socio-demographic factors of Assen?'*, there are small variation between neighbourhoods regarding socio-demographic factors. Most visible are the distribution of age groups and types of household between the areas. Marginally there are some spatial difference regarding income. However, there is no indication that the neighbourhoods of Assen deal with processes of segregation or gentrification. Segregation would according to (Sampson, 2019) lead to increased inequality between neighbourhoods. Sampson furthermore states that gentrification on the other hand increases inequality within the neighbourhood.

Secondly, it is analysed to what extent income inequality affects factors of subjective well-being. Through statistical analyses, it is discovered that there is a relation between perceived safety and income inequality. According to Collins & Guidry (2018) this would be the result of diminished social cohesion. However, this research has not discovered a relation between social cohesion and income inequality. We can therefore reject H0; there is no correlation between SWB and income inequality within neighbourhoods. Thus, we accept H1: there is a correlation between SWB and income inequality within neighbourhoods. Therefore, the second question of the paper; '*To what extent does income inequality affect factors of subjective well-being?',* can be answered. There is evidence that income inequality has an effect on perceived safety and therefore will affect subjective well-being within the neighbourhoods of Assen.

The paper concludes with the question; *'To what extent are the socio-demographic factors of low-education and unemployment explained by socio-demographical factors?'*. It is discovered that socio-demographic factors within a neighbourhood are able to explain the socio-demographic factors of low-education and unemployment. Especially the socio-demographic factors about; social rent housing, low-income, marital status, and type of household hold a large explanatory power on low-education and unemployment.

To answer the main research question; *'To what extent do socio-demographical factors affect the factors of subjective well-being and wider social well-being, in the city of Assen?'*, socio-demographic factors affect subjective well-being. Income inequality has a positive effect on perceived safety and therefore affects SWB within the neighbourhoods of Assen. Socio-demographic factors furthermore affect the factors of education and unemployment that according to literature have an effect on subjective well-being. Therefore, it is concluded that socio-demographic factors affect subjective well-being and wider social well-being within the neighbourhoods of Assen.

9 References

Allison, P.D., (1978). Measures of inequality. *American Sociological Review*, 43, 865-880.

Agrawal, J., Murthy, P., Philip, M., Mehrotra S., Thennarasu K., John, J.P, Girish N., Thippeswamy, V. & Isaac, M. (2010). Socio-demographic Correlates of Subjective Well-being in Urban India. *Social Indicators Research,* 101, 419-434.

Ballas, D., Dorling, D. and Hennig, B.D. (2017). Analysing the regional geography of poverty, austerity and inequality in Europe: a human cartographic perspective. *Regional studie*, 50 (1), 174-185.

Berg, J. van den & Eerenbeemt, M. van den (2021). Regio steeds meer in trek bij senioren en gezinnen met hogere inkomens uit de Randstad. De Volkskrant, 14-01-2021. Retrieved on 24-02-2021 from https://www.volkskrant.nl/cs-b359517e

CBS (2012). *Welvaart in Nederland*. The Hague: CBS

CBS (2017). *Inkomensongelijkheid personen: persoonskenmerken, 2000-2014.* Retrieved on 06-03-2021 from https://opendata.cbs.nl/statline/#/CBS/nl/dataset/71512ned/table?ts=1614983812958.

CBS (2017). *Inwoners per gemeente.* Retrieved: 27-04-2021 from https://www.cbs.nl/nl-nl/visualisaties/dashboard-bevolking/regionaal/inwoners.

CBS, (2018). Statistische Trends. *Meten van inkomen & inkomensongelijkheid.* The Hague: CBS.

CBS, (2021). *Meer verhuizingen naar regio's buiten de Randstad.* The Hague: CBS. Retrieved on 24-02-2021 from https://www.cbs.nl/nl-nl/nieuws/2020/17/in-1e-kwartaal-2020-opnieuw-grootste-prijsstijging-in-provincie-groningen.

Collins C.R., Guidry S. (2018). What effect does inequality have on residents' sense of safety? Exploring the mediating processes of social capital and civic engagement. *Journal of Urban Affairs*, 40(7), 1009–1026.

Doets, B., Nicolai, P., Edzes, A., Koster, S., Broekhuizen, T., & Los, B. (2020). De Stand van de Noord-Nederlandse Economie: *Impact van de coronacrisis*.

Drukker, M., Feron F.J.M., Os J. van (2004). Income inequality at neighbourhood level and quality of life. *Soc Psychiatry Psychiatr Epidemiol*, 39, 457–463.

Geijp, J. (2020). Coronacrisis genadiger voor economie van Noord-Nederland. Groningen-Assen minst getroffen, hardste klappen voor Eemsdelta. *Dagblad van het Noorden*, 19 mei 2020. Retrieved on 24-02-2021 from https://www.dvhn.nl/economie/Coronacrisis-milder-voor-het-Noorden.-Regio-Groningen-Assen-minst-getroffen-hardste-klappen-voor-Eemsdelta-25676886.html

Gjonça, E. & Calderwood, L. (2004). Socio-demographic characteristics. ELSA, 03(02), 15-32.

Houa, F. & Myles, J. (2005). Neighbourhood inequality, neighbourhood affluence and population health. *Social Science & Medicine*, 60, 1557–1569.

Housing Act (2021). Retrieved on 05-03-2021 from https://wetten.overheid.nl/BWBR0005181/2021-01-01

Krueger, A.B. (2012). *The Rise and Consequences of Inequality in the United States*. Retrieved 23-02-2021 from https://obamawhitehouse.archives.gov/sites/default/files/krueger_cap_speech_final_remarks.pdf

Marks, N., Abdallah, S., Simms, A., & Thompson, S. (2006). *The happy planet index*. London: New Economics Foundation.

Maslow, A. H. (1943). A theory of human motivation. *Psychological Review*, 50(4), 370–396.

McCann, P. (2020). Perceptions of regional inequality and the geography of discontent: insights from the UK. *Regional Studies*, 54(2), 256-267.

Mueller, J. H., Schuessler, K. F. & Costner, H. L. (1977). *Statistical Reasoning in Sociology. 3rd ed*. Boston: Houghton-Mifflin.

Namrata, G. & Tridip, R. (2016). Inequality, neighbourhoods and welfare of the poor. *Journal of Development Economics*, 122, 214-228.

Oishi, S., Kesebir, S. & Diener, E. (2011). Income Inequality and Happiness. *Psychological Science*, 22(9), 1095–1100.

Sampson, R. J. (2019). Neighbourhood effects and beyond: Explaining the paradoxes of inequality in the changing American metropolis. *Urban Studies*, 56(1), 3–32.

SCP (2013). *De sociale staat van Nederland 2013*. The Hague: Sociaal Cultureel Planbureau.

Sen, A. (1992). *Inequality reexamined*, New York/Oxford: Clarendon Press. Swagerman, A. (2021). Meer verhuizingen naar regio's buiten de Randstad. CBS, 24-02-2021. Retrieved on 24-02-2021 from https://www.cbs.nl/nl-nl/nieuws/2021/08/meer-verhuizingen-naar-regio-s-buiten-de-randstad.

Smirzai, A. (1997). *Economic and Social Development. Trends, Problems and Policies*. Prentice Hall. London, New York.

Thomas, B., Pritchard, J., Ballas, D., Vickers, D. and Dorling, D. (2009). *A Tale of Two Cities: The Sheffield Project*. Sheffield.

Vauclair, M. & Bratanova, B. (2016). Income inequality and fear of crime across the European region. *European Journal of Criminology*, 14(2), 1–21.

Veldboer, L. & Bergstra, M. (2011). *Does income diversity increase trust in the neighbourhood? The social impact of gentrification in Amsterdam.*

WRR (2014). Hoe ongelijk is Nederland? Een verkenning van de ontwikkeling en gevolgen van economische ongelijkheid. *WRR-Verkenningen.* (28). The Hague.

Zagorski, K., Evans, M.D.R., Kelley, J. Piotrowska, K. (2014) Does National Income Inequality Affect Individuals' Quality of Life in Europe? *Inequality, Happiness, Finances, and Health. Soc Indic Res 117*, 1089–1110.

10 Appendices:

10.1 Syntax

10.1.1 The effect of 'Income Inequality' on the factors of 'Subjective Well-being'

```
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS CI(95) R ANOVA
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT SAFEETY
  /METHOD=ENTER GINI_INDEX.

REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS CI(95) R ANOVA
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT SOCIAL_COHESION
  /METHOD=ENTER GINI_INDEX.

REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS CI(95) R ANOVA
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT LIVING_ENVIRONMENT
  /METHOD=ENTER GINI_INDEX.
```

10.1.2 … with socio-demographic factors

```
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS CI(95) R ANOVA
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT SAFEETY
  /METHOD=ENTER GINI_INDEX P_00_14_JR P_15_24_JR P_25_44_JR P_45_64_JR P_65_EO_JR P_UNMARRIED
    P_DIVORCED P_LowInc_HH P_HighInc_HH.

REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS CI(95) R ANOVA
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT SAFEETY
  /METHOD=ENTER GINI_INDEX P_HH_W_Child P_HighInc_HH.

REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS CI(95) R ANOVA
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT SAFEETY
  /METHOD=ENTER GINI_INDEX P_25_44_JR P_45_64_JR P_65_EO_JR P_HH_WO_Child P_Own_House
    P_Rental_House P_LowInc_HH.
```

10.1.3 The effects of socio-demographic factors on low-education and unemployment

Low-education:

```
DATASET ACTIVATE DataSet1.
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT P_Low_Edu
  /METHOD=ENTER P_NotActive P_SocRent_House P_LowInc_P

DATASET ACTIVATE DataSet1.
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT P_Low_Edu
  /METHOD=ENTER P_LowInc_HH P_HH_WO_Child P_DIVORCED P_HH_W_Child

DATASET ACTIVATE DataSet1.
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT P_Low_Edu
  /METHOD=ENTER P_SINGLE_P_HH P_UNMARRIED P_LowInc_P P_DIVORCED
```

Unemployed:

```
DATASET ACTIVATE DataSet1.
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT P_NotActive
  /METHOD=ENTER P_LowInc_HH P_15_24_JR P_25_44_JR P_45_64_JR P_WIDOWED, P_65_EO_JR

DATASET ACTIVATE DataSet1.
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT P_NotActive
  /METHOD=ENTER P_LowInc_HH P_HH_W_Child P_SINGLE_P_HH
```

```
DATASET ACTIVATE DataSet1.
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT P_NotActive
  /METHOD=ENTER P_MARRIED P_HH_W_Child P_SocRent_House

DATASET ACTIVATE DataSet1.
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT P_NotActive
  /METHOD=ENTER P_Own_House P_HH_W_Child P_MARRIED P_SocRent_House
```