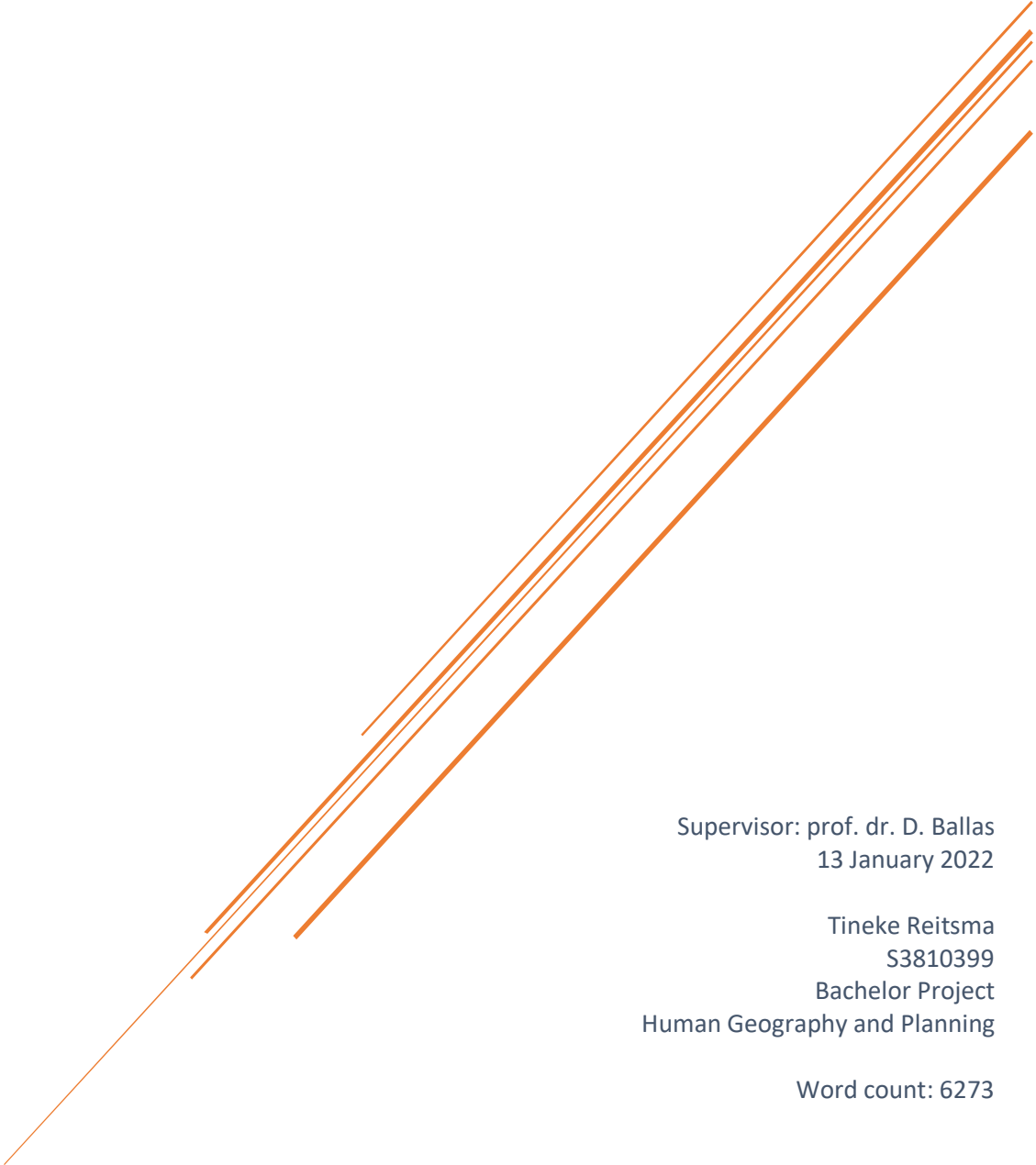# Determinants of Subjective Wellbeing in Urban and Rural Areas in the UK

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13 January 2022

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Bachelor Project
Human Geography and Planning

Word count: 6273

Summary

When studying subjective wellbeing in urban and rural areas, it is known that the level of subjective wellbeing usually differs between urban and rural areas. In this research, it is studied to what extent the determinants of subjective wellbeing differ between urban and rural areas. Additionally, it is studied whether the determinants of subjective wellbeing differ when one earns below or above the country's median income. Individual respondent data from UK's Understanding Society survey is used in a Multiple Linear Regression (MLR), where the effect of several explanatory variables on subjective wellbeing is studied. The result is that income plays a significant role in determining subjective wellbeing in urban areas, whereas it has no effect in rural areas. Furthermore, level of education is only significantly impacting subjective wellbeing when income is below median income, regardless one lives in an urban or rural area. The same is true for being unemployed: only when earning below median income, being unemployed is negatively affecting subjective wellbeing. Lastly, general health is a main determinant for subjective wellbeing, no matter whether one lives in an urban or rural area, or if one earns below or above median income.

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Introduction

When asking people about their subjective wellbeing, or to rate their happiness on a scale from very happy to not happy at all, there are numerous factors that have, to a greater or lesser extent, influence on the answer one gives. These determinants vary from person-based determinants to place-based determinants. Place-based determinants are related to the physical environment of the place one is living, person-based determinants are related to socio-demographic factors and personality traits (Ballas & Tranmer, 2012; Burger, Morrison, Hendriks, & Hoogerbrugge, 2020; Hoogerbrugge & Burger, 2021). In addition, it can be questioned whether people are happy because they live in a place with particular characteristics, or people are happy because of person-based determinants (Ballas, 2013). Previous studies have shown that subjective wellbeing is mainly attributable to the individual level (person-based determinants), and wellbeing usually varies between people, not places (Ballas & Tranmer, 2012; Ballas, 2018; Hoogerbrugge & Burger, 2021). Nevertheless, it is known that there are differences in subjective wellbeing of people when comparing regions with different characteristics. A common example is that people living in urban areas usually experience lower levels of subjective wellbeing than people living in rural areas. Studies tend to relate the difference to the high level of social cohesion and the peace given by nature in rural areas, which are missing elements in city-life (Shucksmith, Cameron, Merridew, & Pichler, 2009; Sorensen, 2014).

One might wonder whether the people living in urban and rural areas are not different in nature, causing differences in subjective wellbeing. That is, do urban areas attract people with different personality traits and socio-demographic characteristics than rural areas do? Socio-demographic factors can, to a certain extent, explain urban-rural differences in subjective wellbeing, as some groups thrive better in an urban environment while a rural environment is beneficial for others (Burger et al., 2020; Hoogerbrugge & Burger, 2021). However, research focussing on urban-rural differences in relation to the influence of socio-demographic factors is limited up until now, especially on a national level. Zooming out to an international level, Sarracino (2013) found that, when comparing high- and low income countries, what makes people happy is comparable across people, countries, and cultures. Nevertheless, when studying the determinants of happiness in the two sets of countries, Sarracino (2013) found that, although income is significantly positively related to both high and low income countries, income is stronger related to happiness in low income countries than in high income countries. Furthermore, not only absolute income plays an important role in determining happiness, relative income does so too (Oishi & Kesebir, 2015; Sarracino, 2013). People tend to be less happy when they are surrounded by people whose income is higher (Luttmer, 2005).

Research studying subjective wellbeing and their determinants, corresponding urban-rural differences, and the role of (absolute and/or relative) income are mostly focusing on one of the three topics. This research will combine the three concepts into one study, focusing on the socio-demographic factors determining subjective wellbeing in urban and rural areas, while also considering income. The relative role of income will be explored, in terms of whether people earn above or below the median income of their country. This leads to the following main- and sub-research questions:

To what extent do the determinants of subjective wellbeing differ between urban and rural areas when considering relative income?
1. *What are the main determinants of subjective wellbeing according to current literature?*
2. *To what extent does the effect of a change in one's income on a persons' subjective wellbeing differ between urban and rural areas?*

The remainder of this research is structured as follows: in the theoretical framework, relevant concepts and theories are discussed. Next, the methodology of the empirical study is discussed, followed by the results, where data is discussed through the lens of theory. Last, main points and takeaways are summarized in the conclusion.

Theoretical framework

Before discussing the determinants of subjective wellbeing, it is worthwhile to consider the term subjective wellbeing, compared to happiness, subjective happiness, and life satisfaction. All terms are used when discussing the topic, and while some authors do make a difference between them, the terms are mostly used interchangeable. This research will use the term subjective wellbeing. Nevertheless, when discussing other literature, the term(s) used in that specific study will be upheld.

Important determinants for subjective wellbeing include income, education, health, employment status, age, gender, income inequality, and relative income (Easterlin, McVey, Switek, Sawangfa, & Zweig, 2010; Ekici & Koydemir, 2016; FitzRoy & Nolan, 2020; Gu & Wei, 2018; Oishi & Kesebir, 2015). For some of these determinants, its influence is fairly clear. Other determinants are much more disputed. Income is a determinant of which its role is largely disputed. The general expectation of the public eye and assumption in public policy is that people are happier when their income grows (Oishi & Kesebir, 2015). Yet, according to Easterlin (1974), happiness does not increase as a country's income rises over the long-term, a concept known as the Easterlin paradox. Since its first discovery in 1974, Easterlin has not found a significant relationship between income and happiness (Easterlin et al., 2010). Nevertheless, there are still numerous studies finding income and subjective wellbeing are related to a greater or lesser extent. For example, Gu and Wei (2018) conducted research on determinants of happiness based on UK Understanding Society data. One of their main result is the significance of income on people's happiness. When people have an income with which they can 'live comfortably', 'do alright', or 'just about getting by', income does have a significant positive impact on happiness. On the contrary, when people experience large difficulties with their income, income has a significant negative impact on happiness (2018), contrasting Easterlin et al. (2010). This is in line with i.a. Ball and Chernova (2008) and Sorensen (2014), who find a significant positive relationship between income and happiness.

When considering possible causes of this divergence, income inequality plays an important role. The role of relative income and the position of one's income in the national income distribution, is largely influential on subjective wellbeing (Clark, 2003; Luttmer, 2005). Similarly, self-reported happiness tends to be lower when the income of neighbours is higher (Luttmer, 2005) . On an international level, countries with high income inequality tend to experience lower levels of subjective wellbeing, even if income increases (Oishi & Kesebir, 2015). Additionally, life satisfaction of people is on average lower in years of increased income inequality. This result is found in both developed and less developed countries. However, when Oishi and Kesebir (2015) control for income inequality, there is a discrepancy between the two sets of countries. In developed countries, increases in GDP per capita are associated with significant increases in life satisfaction, whereas an increase in GDP per capita is associated with significant decreases in life satisfaction in developing countries. This also raises the question what further determines life satisfaction in the two sets of countries, and whether or not these determinants differ. When Sarracino (2013) studied the richest and poorest countries worldwide, he finds that, although income is stronger related to happiness in low income countries than in high income countries, wellbeing is shaped by similar determinants in both groups of countries.

Next to subjective wellbeing, income inequality also influences health: people living in countries with higher income inequality tend to have worse health than people living in countries with low income inequality (Wilkinson & Pickett, 2006). The worse health in countries with high income inequality can be related to increased status competition, leading to increased stress and/or anxiety, which can cause a variety of illnesses (Buttrick & Oishi, 2017). Important to mention is that especially the people with a relative low income, and thus suffering the most from income inequality, tend to have to deal with lower subjective wellbeing and health problems. Additionally, especially the relative status and status competition in highly unequal countries lead to decreases in subjective wellbeing, and not the

relatively low income itself (Buttrick & Oishi, 2017). In countries with less inequality, status competition is less important, and is also less related to subjective wellbeing and health (Fournier, 2020).

When studying factors other than income, Gu and Wei (2018) find that, on the UK level, retirement, and having 'excellent' or 'very good' health are the main factors positively impacting happiness. This is in line with other studies, which find that health is usually highly related to subjective wellbeing (Dolan, Peasgood, & White, 2007; Gerdtham & Johannesson, 2001; Hoogerbrugge & Burger, 2021; Peiró, 2006). Moreover, age is strongly related to life satisfaction. The relation is 'U' shaped – life satisfaction reaches its bottom at age forty and increases again afterwards (e.g. Blanchflower & Oswald, 2004; Blanchflower & Oswald, 2008; Gerdtham & Johannesson, 2001). From this follows that retired people rate relatively high levels of subjective wellbeing. Additionally, according to Gerdtham and Johannesson (2001) and Frey and Stutzer (2002), average subjective wellbeing of females is higher than males. Nonetheless, Sorensen (2014) find it the other way around: males are happier than females.

Furthermore, subjective wellbeing and level of education are related: when level of education increases, subjective wellbeing tends to increase too (Gerdtham & Johannesson, 2001; Sorensen, 2014). Additionally, people with higher levels of education rate higher subjective wellbeing than people with lower levels of education (FitzRoy & Nolan, 2020). When considering urban and rural areas, high educated people are happier in urban areas, whereas low and medium educated people are happier in rural areas (Burger et al., 2020).

With regards to employment status, being retired or being a student is positively related to life satisfaction (Sorensen, 2014). On the other hand, being unemployed is negatively related to life satisfaction (Clark & Oswald, 1994; Clark, 2003; Gerdtham & Johannesson, 2001; Sorensen, 2014). Being outside the workforce as a student or retiree thus leads to higher levels of life satisfaction, being unemployed leads to a decrease in life satisfaction according to previous studies. When taking into account the subjective wellbeing of students, students of non-tertiary education are happier in rural areas, whereas students of tertiary education are happier in urban areas (Burger et al., 2020).

Gu and Wei (2018) also find the variable 'region' to have a significant influence on happiness in the UK: people in the London region are significantly less happy than people in other locations throughout the country. Gu and Wei (2018) do not have a main explanation for this. However, from other studies it is known that people living in rural areas generally experience higher subjective wellbeing than people living in urban areas, regardless of their income (Hoogerbrugge & Burger, 2021; Shucksmith et al., 2009; Sorensen, 2014). What exactly causes these differences remains yet unclear, but current studies tend to pin into the direction of community feeling, which is usually high in rural areas and low in urban areas. Additionally, increased income inequality in urban areas might play a role (Burger et al., 2020; Hoogerbrugge & Burger, 2021; Sorensen, 2014). Moreover, it is known that the unhappy people of the countryside tend to move to the city: cities do often have relatively more singles, unemployed, and migrants, which reduce average subjective wellbeing in cities (Veenhoven, 1994). Furthermore, some studies suspect that the two types of areas attract people with different preferences and personality traits, causing the differences in subjective wellbeing (Hoogerbrugge & Burger, 2021). For example, it is known that urban life usually has a positive effect on students' subjective wellbeing, and a negative effect on subjective wellbeing of people with non-tertiary education (Burger et al., 2020; Hoogerbrugge & Burger, 2021). Likewise, highly educated people thrive by the possibilities offered in urban environments, both from a career perspective as well as the endless amount of amenities offered by cities (Burger, Meijers, & Van Oort, 2014).

The result of lower wellbeing in cities can be a result of higher inequality and the lower educated people in urban areas; subjective wellbeing experienced in urban areas by this group is much lower than subjective wellbeing of high educated people in urban areas. This is due to, amongst other

reasons, relatively lower income, higher housing costs, greater inequality, and longer commuting times (Morrison, 2018). High educated people do usually not have to suffer from such things, since their income is usually much higher.

Further looking into subjective wellbeing and urban and rural areas, Lenzi and Perucca (2018) find that especially for people living in rural areas of urbanised regions, subjective wellbeing is high. In such situations, urbanisation benefits are also positive for people living in rural areas, while they do not have to deal with e.g. high costs of living (Lenzi & Perucca, 2018). This is in line with (Burger et al., 2020), who argue that rural populations in the Western world are closely connected to cities by well-developed transport systems, and are thus able to benefit from the positive effects of cities.

In summary, and to answer sub research question 1, the main determinants of subjective wellbeing according to current literature are income, age, gender, level of education, general health, and employment status. By answering this question, it should be acknowledged that current literature studies numerous variables potentially affecting subjective wellbeing. Still, the abovementioned variables are most prevalent and influential.

The most relevant literature is visualised in Figure 1. Subjective wellbeing is shown in the middle. On the left-hand side, key determinants, mostly socio-demographic, influencing subjective wellbeing are seen. On the right-hand side, the effect of region is presented. Additionally, socio-demographic characteristics can influence the region one is living, and the other way around (apart from age and gender).
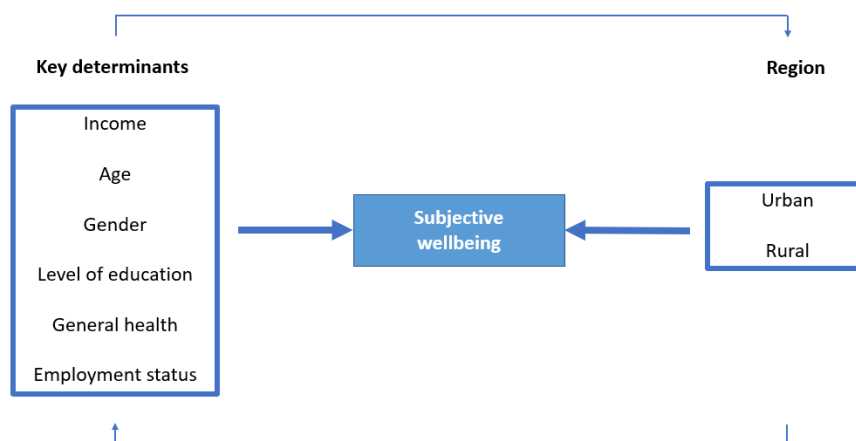
Figure 1: Conceptual Model

Based on the theoretical framework and the conceptual model, the following hypotheses will be tested:
- The determinants of subjective wellbeing differ between urban and rural areas.
- The determinants of subjective wellbeing do not differ between above and below median income groups.
- The effect of a change in one's income on a person's subjective wellbeing does not differ between urban and rural areas.

Methodology

To study the topic of subjective wellbeing in urban and rural areas, individual respondent data from Understanding Society is used. Understanding Society is an annual multi-topic, longitudinal study in the UK, where yearly the same respondents are surveyed (Understanding Society, 2021). The study includes, amongst many others variables, demographic features as well as an extensive section on

subjective wellbeing, which are of interest for this research. Data from the latest available edition (wave 10, conducted in 2019) is used. Based on the above described literature, the following variables will be studied: subjective wellbeing, age, gender, general health, level of education, economic activity (employment), and monthly income. Table 9 in Appendix A shows in more detail which exact variables are used.

The variable 'subjective wellbeing' is studied as the dependent variable. The variable is based on a Likert scale from 0 (the least distressed) to 36 (the most distressed). This number is based upon 12 underlying questions of the General Health Questionnaire (GHQ), where participants rate their wellbeing on a 1 to 4 scale by answering several questions about their health. These answers are recoded to a single scale so that the scale for every variable runs from 0 to 3, and are then summed up, leading to a scale running from 0 (the least distressed) to 36 (the most distressed) (Understanding Society, 2021e). The variable is treated as a quantitative, continuous variable. Although it could be discussed whether the variable is continuous or categorical, this is a common approach in happiness research (see e.g. Ballas, 2018; Blanchflower & Oswald, 2004; Gerdtham & Johannesson, 2001; Hoogerbrugge & Burger, 2021). Table 1 shows the summary statistics of this variable. The GHQ questions are shown in Appendix B.

Subjective well-being	Frequency	Percentage	Cumulative percentage
1.00	76	.3	.3
2.00	98	.3	.6
3.00	174	.6	1.2
4.00	280	.9	2.1
5.00	596	2.0	4.1
6.00	3621	12.2	16.3
7.00	2804	9.4	25.7
8.00	2651	8.9	34.6
9.00	2467	8.3	42.9
10.00	2452	8.2	51.2
11.00	2902	9.8	60.9
12.00	3259	11.0	71.9
13.00	1425	4.8	76.7
14.00	1013	3.4	80.1
15.00	866	2.9	83.0
16.00	646	2.2	85.2
17.00	649	2.2	87.4
18.00	498	1.7	89.0
19.00	493	1.7	90.7
20.00	445	1.5	92.2
21.00	377	1,.3	93.5
22.00	312	1.0	94.5
23.00	273	.9	95.4
24.00	313	1.1	96.5
25.00	191	.6	97.1
26.00	149	.5	97.6
27.00	123	.4	98.0
28.00	93	.3	98.4
29.00	81	.3	98.6
30.00	70	.2	98.9

	31.00	69	.2	99.1
	32.00	61	.2	99.3
	33.00	46	.2	99.5
	34.00	58	.2	99.7
	35.00	47	.2	99.8
	36.00	55	.2	100.0
	Total	29,733	100.0	

Table 1: Summary Statistics Subjective Wellbeing (dependent variable)

The following features are studied as independent variables: age, gender, general health, level of education, economic activity (employment), and monthly income. The frequencies of these variables are shown in Table 2. Demographic features provided by Understanding Society are in many cases derived from the questionnaire. That is, answers from previous editions are checked and updated if necessary. This means that participants do not have to answer all demographic questions every time they participate in the survey, but that the information is monitored and updated by Understanding Society (Understanding Society, 2021a).

Variable	Category	Frequency	Percentage	Cumulative percentage
Highest qualification (education)	Degree	8801	29.6	29.6
	Other higher degree	3800	12.8	42.4
	A-level etc	6195	20.8	63.2
	GCSE etc	5791	19.5	82.7
	Other qualification	2489	8.4	91.1
	No qualification (= reference cat.)	2657	8.9	100.0
	Total	29733	100.0	
Gender	Male (= reference cat.)	13175	44.3	44.3
	Female	16558	55.7	100.0
	Total	29733	100.0	
General health	Excellent	3021	10.2	10.2
	Very good	10252	34.5	44.6
	Good	9919	33.4	78.0
	Fair	4829	16.2	94.2
	Poor (= reference cat.)	1712	5.8	100.0
	Total	29733	100.0	
Current economic activity	Self employed	2386	8.0	8.0
	Paid employment (ft/pt) (= reference cat.)	14832	49.9	57.9
	Unemployed	874	2.9	60.8
	Retired	7933	26.7	87.5
	On maternity leave	189	.6	88.2
	Family care or home	998	3.4	91.5

Full-time student	1236	4.2	95.7	
LT sick or disabled	1001	3.4	99.0	
Govt training scheme	10	.0	99.1	
Unpaid, family business	22	.1	99.2	
On apprenticeship	76	.3	99.4	
Doing something else	176	.6	100,0	
Total	29,733	100.0		

	Mean	Std. dev.	Median	Minimum	Maximum
Total monthly personal income gross	1,998.30	1,677.17	1,600.00	0	26634.3
Age	51	18.25	51	16	103

Table 2: Frequency Table and Descriptive Statistics Independent Variables

In the dataset, age is derived from the year of birth of the respondents (Understanding Society, 2021a). Gender (male/female) is derived and cross-wave checked. If the information in the survey is inconsistent and information in the database does also not suggest a particular gender, gender is considered to be inconsistent (Understanding Society, 2021). For the aim of this research, only males and females have been included in the analysis. To determine general health, participants are asked the following question: "In general, would you say your health is excellent, very good, good, fair, or poor?", where one answer is selected (Understanding Society, 2021c). The level of education is based on the highest educational or vocational qualification of participants. This information is updated each year to ensure the most recent qualifications are included. The last highest qualification derived variable is fed forward and then updated with new qualifications obtained (Understanding Society, 2021d). To explore participants' employment situation, the question "which of these best describes your current employment situation?" is asked. Participants choose the most applicable category. For income, the variable total personal gross monthly income is studied. Income information for this variable is collected from individuals' earnings from main and second jobs, social security benefits, state and private benefits, private transfers and investment income (Understanding Society, 2021a).

To answer the research questions, multiple linear regression (MLR) analysis is performed. Because subjective wellbeing, the dependent variable, is treated as a continuous variable and the strength of the effect that the independent variables have on the dependent variable is of interest, MLR is considered as a suitable option for the aim of this research. Age, gender, general health, level of education, economic activity, and gross monthly income are the independent variables. In wave 10, 34,318 respondents participated in the questionnaire. After data management and cleaning, 29,733 respondents are included in the analysis. Table 10 (in Appendix C) presents which data is excluded and the rationale behind this.

To make MLR possible with categorical variables, the categorical variables are recoded into dummy variables. Dummy coding enables categorical variables to transform into a series of dichotomous variables, which can then be included in MLR (Burt, Barber, & Rigby, 2009). For every categorical variable, k-1 (one reference category) new variables are computed. The variables and reference categories can be found in Table 2.

The aim of this research is to discover to what extent the determinants of subjective wellbeing differ between urban and rural areas when considering relative income. To study relative income, UK national median income is used, which is £2622 (Office for National Statistics, 2019). When a person's income is below UK median income, the person earns relatively less than the 'middle' of the

population, and the other way around. This makes it is possible to compare the determinants of subjective wellbeing for people whose income is above and below the UK median income, and to see whether or not they rate subjective wellbeing in the same way. The median value of average national income is used instead of the mean, as income is likely to have large outliers, which might distort the mean value to be representative for the population.

For the aims of this research, five models are created. The first model functions as a reference, where the determinants of subjective wellbeing in the UK are studied, without grouping data based on region and income yet. Next, all respondents are grouped into living in urban or rural areas. This classification is provided by Understanding Society, based on address. A respondent is considered to live in an urban area if the address falls within a settlement with a population of 10,000 or more. If the population is smaller, the address is considered to be in a rural area (Understanding Society, 2021f). Subsequently, urban and rural respondents are categorized based on total personal gross monthly income. For this, the UK gross monthly median income for fulltime employment is used. The five models and associated frequencies are shown in Table 3.

Model	Region	Income	Frequency
0			29733
1	Urban	≥ median income	5183
2	Urban	< median income	16959
3	Rural	≥ median income	1897
4	Rural	< median income	5694

Table 3: Frequency per model

Results

Studying the determinants of subjective wellbeing in the UK in general (before grouping the data), 24.3% can be explained by the set of independent variables studied in this research, as shown in Table 4. Table 5 shows which variables add significantly to subjective wellbeing (significant variables in bold). By interpreting the results, it is important to keep the nature of the dependent variable in mind: subjective wellbeing is ranged 0-36, where 0 is the least distressed and 36 the most distressed. The positive significant values indicate that these variables lead to higher stress levels (decreased subjective wellbeing), whereas the negative significant values lead to a decrease in stress (increased subjective wellbeing). From this follows that an increase in income, leads to higher stress levels. This is contrary from many previous studies, where income either has no effect (Easterlin et al, 2010) or a positive effect on subjective wellbeing (Ball & Chernova, 2008; Gu & Wei, 2018). Looking at education, having a degree, other higher degree, A-level, or GCSE leads to higher stress levels than when no education is obtained (which is the reference group). This contradicts e.g. Gerdtham and Johannesson (2001) and Sorensen (2014), who find a decrease in stress when level of education increases. Being unemployed, involved in family care or home, full-time student or long-term (LT) sick or disabled also leads to an increase in stress compared to being in paid employment. This partly aligns with Clark and Oswald (1994), Gerdtham and Johannesson (2001), and Sorensen (2014), where being unemployed is negatively related to subjective wellbeing. However, being a student has a positive effect in these studies, where it has a negative effect in this research. Also, females are more distressed than males in this model, confirming Sorensen (2014). On the contrary, retirement is associated with lower stress levels than when in paid employment. When general health is excellent, very good, good or fair, people are also less distressed than when having poor general health, aligning with e.g. Peiró (2006) and Gu and Wei (2018).

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
0	0.494	0.244	0.243	4.81258

Table 4: Model Summary Model 0

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
0	(Constant)	19.293	0.214		90.250	0.000
	Total monthly personal income	**4.059E-05**	**0.000**	**0.012**	**2.050**	**0.040**
	Age	**-0.050**	**0.003**	**-0.167**	**-19.825**	**0.000**
	Education					
	Degree	**0.814**	**0.118**	**0.067**	**6.925**	**0.000**
	Other higher degree	**0.618**	**0.126**	**0.037**	**4.886**	**0.000**
	A-level etc	**0.474**	**0.119**	**0.035**	**3.989**	**0.000**
	GCSE etc	**0.395**	**0.117**	**0.028**	**3.363**	**0.001**
	Other qualification	0.209	0.135	0.010	1.547	0.122
	General health					
	Excellent	**-9.761**	**0.160**	**-0.533**	**-60.836**	**0.000**
	Very good	**-8.243**	**0.141**	**-0.708**	**-58.443**	**0.000**
	Good	**-6.537**	**0.140**	**-0.557**	**-46.833**	**0.000**
	Fair	**-3.951**	**0.143**	**-0.263**	**-27.622**	**0.000**
	Economic activity					
	Self employed	-0.134	0.108	-0.007	-1.242	0.214
	Unemployed	**2.200**	**0.172**	**0.067**	**12.768**	**0.000**
	Retired	**-0.351**	**0.102**	**-0.028**	**-3.448**	**0.001**
	On maternity leave	0.046	0.355	0.001	0.130	0.896
	Family care or home	**0.539**	**0.162**	**0.018**	**3.339**	**0.001**
	Full-time student	**0.501**	**0.157**	**0.018**	**3.193**	**0.001**
	LT sick or disabled	**2.962**	**0.178**	**0.097**	**16.625**	**0.000**
	Govt. Training scheme	-0.474	1.523	-0.002	-0.311	0.756
	Unpaid, family business	0.374	1.027	0.002	0.364	0.716
	On apprenticeship	-0.769	0.557	-0.007	-1.380	0.167
	Doing something else	0.454	0.366	0.006	1.239	0.215
	Gender					
	Female	**1.090**	**0.059**	**0.098**	**18.481**	**0.000**

Table 5: Coefficients Model 0

Table 6 shows the model summary of the four models considering urbanity and income. With respectively an adjusted R^2 of 0.261 and 0.248, model 2 (urban, < median income) and model 4 (rural, < median income) can best predict subjective wellbeing. Subjective wellbeing of respondents earning below UK median income, living in urban or rural areas can thus best be predicted. As shown in Table 6, the adjusted R^2 values of model 1 (urban, ≥ median income) and model 3 (rural, ≥ median income) indicate that these models are less well able to explain subjective wellbeing of respondents living in urban or rural areas and earning ≥ median income.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.375	0.140	0.137	4.39971
2	0.512	0.262	0.261	5.02742
3	0.410	0.168	0.159	4.44161
4	0.501	0.251	0.248	4.61614

Table 6: Model Summary Model 1-4

Table 7 (model 1 and 2) and 8 (model 3 and 4) show the coefficients of the four models. In model 1 (urban, ≥ median income), when income increases, stress level also increases, as is indicated by the significant positive value. Nevertheless, the coefficient is very small, indicating only a small effect. The positive effect of income on level of stress is not in line with previous research, where income usually tends to have a negative effect on stress (e.g. Ball & Chernova, 2008; Gu & Wei, 2018; Oishi & Kesebir, 2015). For age this means that when age increases, the value of subjective wellbeing decreases, meaning people become less stressed, partly matching Blanchflower and Oswald (2004) in that subjective wellbeing increases when age increases. However, the U-shape relation is not tested in this research, making it not possible to confirm this. The insignificant values for education indicate that education levels degree, other higher degree, A-level, GCSE, and other qualifications do not lead to higher stress levels than when no education is obtained. This does not equal previous research, where an increase in education usually leads to an increase in subjective wellbeing (Gerdtham & Johannesson, 2001; Sorensen, 2014). The negative values for general health categories excellent, very good, good, and fair indicate that when belonging to one of these health categories, it leads to less stress than when being in poor general health, aligning with Gu and Wei (2018), Gerdtham and Johannesson (2001), Hoogerbrugge and Burger (2021), and Peiró (2006). Regarding economic activity, only when being involved in family care or home or being LT sick or disabled leads to higher stress levels than when in paid employment. All other categories do not lead to higher/lower stress levels than when being in paid employment. The significant positive value for 'female' indicates that being female leads to more stress than when being male, again confirming Sorensen (2014).

Model 2 (urban, < median income) again shows a positive value for income. Next, the negative value for age indicates a decrease in stress levels when age increases. Furthermore, education levels degree, other higher degree, A-level, and GCSE lead to higher stress levels than when having no educational qualification. This is different from model 1, where no significant value is present for education. Additionally, it is also contrasting literature, where increased education usually leads to higher subjective wellbeing (Gerdtham & Johannesson, 2001; Sorensen, 2014). Having excellent, very good, good, or fair general health does all lead to lower stress levels compared to having poor general health, which is in line with model 1 and theory. In this model, being unemployed leads to higher stress levels than when being in paid employment, confirming results from previous studies (Clark & Oswald, 1994; Sorensen, 2014). The same is true for when being in family care or home, full-time student, or LT sick or disabled. Being retired in an urban area and having a < median income leads to a decrease in stress levels in comparison to when being in paid employment. This is again similar to what is found in e.g. Gerdtham and Johannesson (2001), where retirement also leads to an increase in subjective wellbeing. In this category, being female again causes higher stress levels than when being male.

In model 3 (rural, ≥ median income) (Table 8), the following independent variables have a significant positive effect: being LT sick or disabled, and being female. These variables thus lead to an increase in stress levels, and subsequently to a decrease in subjective wellbeing. Being unemployed does not have a significant effect in this model, which differs from model 1 and 2. The significant negative values for age and excellent, very good, good, and fair general health indicate decreases in stress levels. Interesting to observe is the insignificance of income in this category, meaning that income does not

lead to an increase/decrease in stress levels when living in rural areas and earning ≥ median income. This is different from the two urban models, where income is, although small, a significant value.

In model 4 (rural, < median income) (Table 8), like in model 3, income is not significant. Like in the previous three models, an increase in age here also leads to a decrease in stress levels. Education levels degree and other higher degree lead to increases in stress levels compared to not having obtained any qualification. Also in this model, having excellent general health, very good general health, good general health, or fair general health leads to lower stress levels than when being in poor general health. When considering economic activity, only when unemployed or LT sick or disabled lead to higher stress levels than when in paid employment. All other forms of economic activity do not lead to more/less stress than when in paid employment. In this model, being female also leads to higher stress levels than when being male, as observed in the other models.

When considering the effect of a change in one's income on a persons' subjective wellbeing and whether or not this differs between urban and rural areas, questioned in research question 2, it immediately stands out that income is not a significant determinant of subjective wellbeing in rural areas, no matter if people's income is above or below the UK median gross monthly income. When looking into the effects of income in urban areas, income is for both groups a significant determinant of subjective wellbeing, as can be seen in Table 7. This means that, for people living in urban areas, subjective wellbeing decreases as income increases, which is opposite of what previous studies have found (Ball & Chernova, 2008; Oishi & Kesebir, 2015). Nevertheless, the effect is very minor, making it difficult to make reliable statements based on this result.

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.	Model	Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	17.912	0.779		22.992	0.000	2	19.177	0.286		67.084	0.000
	Total monthly personal income	**9.414E-05**	**0.000**	**0.037**	**2.670**	**0.008**		**0.000**	**0.000**	**0.022**	**2.894**	**0.004**
	Age	**-0.056**	**0.006**	**-0.155**	**-9.301**	**0.000**		**-0.051**	**0.003**	**-0.169**	**-14.626**	**0.000**
	Education											
	Degree	0.492	0.533	0.052	0.924	0.356		**0.856**	**0.154**	**0.061**	**5.547**	**0.000**
	Other higher degree	0.211	0.550	0.015	0.385	0.701		**0.672**	**0.167**	**0.037**	**4.021**	**0.000**
	A-level	0.205	0.547	0.016	0.375	0.708		**0.591**	**0.152**	**0.042**	**3.886**	**0.000**
	GCSE	0.342	0.557	0.021	0.615	0.539		**0.415**	**0.148**	**0.030**	**2.798**	**0.005**
	Other qualification	0.432	0.621	0.016	0.695	0.487		0.297	0.170	0.015	1.747	0.081
	General health											
	Excellent	**-7.962**	**0.523**	**-0.578**	**-15.212**	**0.000**		**-9.943**	**0.212**	**-0.482**	**-46.990**	**0.000**
	Very good	**-6.319**	**0.504**	**-0.660**	**-12.538**	**0.000**		**-8.461**	**0.179**	**-0.670**	**-47.395**	**0.000**
	Good	**-4.825**	**0.505**	**-0.475**	**-9.544**	**0.000**		**-6.648**	**0.175**	**-0.539**	**-38.023**	**0.000**
	Fair	**-2.896**	**0.525**	**-0.184**	**-5.511**	**0.000**		**-3.881**	**0.178**	**-0.258**	**-21.832**	**0.000**
	Economic activity											
	Self employed	-0.260	0.207	-0.017	-1.254	0.210		0.006	0.167	0.000	0.037	0.970
	Unemployed	0.407	1.275	0.004	0.319	0.749		**2.311**	**0.208**	**0.079**	**11.127**	**0.000**
	Retired	-0.357	0.255	-0.023	-1.399	0.162		**-0.442**	**0.143**	**-0.034**	**-3.080**	**0.002**
	On maternity leave	-0.505	0.857	-0.008	-0.590	0.555		0.434	0.480	0.006	0.904	0.366
	Family care or home	**2.131**	**0.888**	**0.031**	**2.401**	**0.016**		**0.640**	**0.199**	**0.023**	**3.219**	**0.001**
	Full-time student	-0.937	0.973	-0.013	-0.964	0.335		**0.676**	**0.198**	**0.027**	**3.417**	**0.001**
	LT sick or disabled	**3.988**	**0.878**	**0.062**	**4.541**	**0.000**		**2.930**	**0.218**	**0.104**	**13.424**	**0.000**
	Govt. training scheme							0.428	1.903	0.001	0.225	0.822
	Unpaid, family business	-5.118	2.547	-0.026	-2.009	0.045		1.954	1.346	0.010	1.451	0.147
	On apprenticeship	2.902	4.407	0.009	0.659	0.510		-0.685	0.692	-0.007	-0.991	0.322
	Doing something else	0.255	1.141	0.003	0.223	0.823		0.584	0.467	0.008	1.250	0.211
	Gender											
	Female	**0.899**	**0.131**	**0.092**	**6.882**	**0.000**		**1.155**	**0.082**	**0.096**	**14.033**	**0.000**

Table 7: Coefficients Model 1 and model 2

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.	Model	Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
3	(Constant)	19.708	1.279		15.405	0.000	4	19.067	0.476		40.047	0.000
	Total monthly personal income	-6.319E-05	0.000	-0.025	-1.153	0.249		-4.420E-06	0.000	-0.001	-0.041	0.967
	Age	**-0.045**	**0.010**	**-0.125**	**-4.325**	**0.000**		**-0.045**	**0.006**	**-0.165**	**-8.146**	**0.000**
	Education											
	Degree	0.841	0.801	0.087	1.049	0.294		**0.772**	**0.242**	**0.058**	**3.192**	**0.001**
	Other higher degree	0.215	0.831	0.015	0.259	0.796		**0.751**	**0.251**	**0.049**	**2.996**	**0.003**
	A-level	-0.134	0.821	-0.010	-0.163	0.871		0.370	0.237	0.029	1.561	0.119
	GCSE	0.295	0.832	0.020	0.354	0.723		0.355	0.231	0.028	1.536	0.125
	Other qualification	-0.583	0.948	-0.022	-0.615	0.538		-0.074	0.266	-0.004	-0.277	0.782
	General health											
	Excellent	**-9.258**	**0.848**	**-0.669**	**-10.917**	**0.000**		**-9.960**	**0.348**	**-0.552**	**-28.625**	**0.000**
	Very good	**-8.285**	**0.815**	**-0.849**	**-10.165**	**0.000**		**-8.268**	**0.300**	**-0.736**	**-27.536**	**0.000**
	Good	**-6.448**	**0.821**	**-0.615**	**-7.858**	**0.000**		**-6.683**	**0.298**	**-0.591**	**-22.426**	**0.000**
	Fair	**-4.241**	**0.863**	**-0.256**	**-4.914**	**0.000**		**-4.223**	**0.306**	**-0.299**	**-13.820**	**0.000**
	Economic activity											
	Self employed	-0.252	0.331	-0.017	-0.762	0.446		-0.133	0.238	-0.007	-0.560	0.576
	Unemployed	4.049	3.154	0.027	1.284	0.199		**2.069**	**0.417**	**0.061**	**4.966**	**0.000**
	Retired	-0.525	0.374	-0.040	-1.403	0.161		-0.141	0.217	-0.013	-0.648	0.517
	On maternity leave	0.452	1.131	0.009	0.400	0.689		-0.917	0.815	-0.013	-1.126	0.260
	Family care or home	1.264	1.208	0.022	1.046	0.296		0.013	0.360	0.000	0.037	0.971
	Full-time student	-1.505	2.597	-0.012	-0.579	0.562		0.607	0.351	0.023	1.728	0.084
	LT sick or disabled	**3.523**	**1.516**	**0.050**	**2.324**	**0.020**		**2.655**	**0.394**	**0.090**	**6.744**	**0.000**
	Govt. training scheme							-2.175	2.674	-0.009	-0.814	0.416
	Unpaid, family business							-0.553	2.073	-0.003	-0.267	0.790
	On apprenticeship	-2.616	4.457	-0.012	-0.587	0.557		-0.781	1.048	-0.009	-0.745	0.456
	Doing something else	0.011	2.228	0.000	0.005	0.996		0.499	0.772	0.008	0.647	0.518
	Gender											
	Female	**0.784**	**0.222**	**0.079**	**3.527**	**0.000**		**1.136**	**0.131**	**0.104**	**8.662**	**0.000**

Table 8: Coefficients model 3 and model 4

Conclusion

Summarizing the results of this research, a few things stand out. An interesting observation is the role of income. Where income shows a significant positive value in urban areas, regardless above/below median income groups, income is not a significant variable in the rural models. Additionally, income shows a significant positive value in model 0, where the entire UK is studied. The fact that income is not significant in the rural areas, suggests that income does not play a role in determining subjective wellbeing in rural areas, regardless of what one is earning. Comparing this result to the literature (e.g. Burger et al, 2020; Burger et al, 2014), it could be argued this is due to less inequality in rural areas, leading to less status competition (in which income tends to play a role) than in urban areas. In the urban areas, income does influence subjective wellbeing: subjective wellbeing decreases when income increases. This is not in line with results from previous studies, where income either does not influence subjective wellbeing (Easterlin et al, 2010) or leads to increased subjective wellbeing (Ball & Chernova, 2008; Oishi & Kesebir, 2015; Sorensen, 2014). Yet, more research is necessary to learn what causes the opposite result in this research.

When studying level of education, it is interesting to notice that significant values are only found in model 2 (urban, < median income) and model 4 (rural, < median income). The positive values for degree, other higher degree, A-level and GCSE in model 2 indicate that when living in an urban area and having < median income, people having obtained these levels of education have higher stress levels compared to people who have not obtained any qualification. For model 4 (rural, < median income), this is true for people with degree and other higher degree. The positive coefficients are an interesting observation, and it is difficult to find an explanation for this. That is, in previous studies, increased level of education leads to increased subjective wellbeing (Gerdtham & Johannesson, 2001; Sorensen, 2014). Based on previous studies, it would be expected that education would show negative significant values. Nevertheless, in this study, education is either not significant or positive significant, leading to increased stress levels.

Next, unemployment has a negative effect on subjective wellbeing only in income groups < median income, regardless of urban or rural areas. In the income groups ≥ median income, unemployment has no effect on subjective wellbeing compared to paid-employment. Being a full-time student in model 2 (urban, < median income) also has a negative effect on subjective wellbeing. This is again an interesting observation, as previous studies found that being a student positively impacts subjective wellbeing (Sorensen, 2014). Especially, it would be expected that being a student in urban areas leads to increased subjective wellbeing, since students tend to thrive in urban environments (Burger et al, 2020). Similarly, negative impacts on subjective wellbeing of being a student in rural areas were to be expected (Burger et al, 2020), but are absent. Additionally, it is also interesting to observe that being unemployed only leads to higher stress levels in the groups < median income. When being unemployed in urban or rural areas and still having a ≥ median income, does not lead to higher stress levels than when in paid employment. Here, the type of area does not seem to make a difference, whereas income (logically) does.

Finally, the role of gender in this model is evident. In all models, being female leads to increased stress levels as compared to being male. This is in line with Sorensen (2014), but contrasting Gerdtham and Johannesson (2001) and Frey and Stutzer (2002). Therefore, it is not possible to generalize the role of gender based on this study and previous studies.

Concluding, by answering the main research question, '*to what extent do the determinants of subjective wellbeing differ between urban and rural areas when considering relative income?*', it stands out that there are determinants of subjective wellbeing that differ in urban and rural areas as well as income groups. Most interesting to observe is that certain determinants are influential in < or ≥ median

income groups, where area does not seem to play a role (e.g. unemployment and level of education in both urban and rural < median income groups). The same is true for area, e.g.: income is significant in both income groups in urban areas, and not significant in both income groups in rural areas.

Answering sub research question 1 *('what are the main determinants of subjective wellbeing according to current literature?')* has led to including the studied variables, as these showed to be most prevalent and important in previous studies regarding the determinants of subjective wellbeing. Ultimately, to answer sub research question 2 *('to what extent does the effect of a change in one's income on a persons' subjective wellbeing differ between urban and rural areas?')*, it can be said that there is an actual difference between urban and rural areas regarding one's subjective wellbeing when there is a change in income. Where income does not significantly impact subjective wellbeing in rural areas, it does play a role in urban areas. Interestingly, when income increases, subjective wellbeing being decreases. However, more research is necessary to be able to explain what causes the direct of this effect.

The research has several limitations. First, the distribution of cases per group is not equal. The income groups ≥ median income are much smaller than the < median income groups. Together with this comes that the median income in the dataset is much smaller than actual UK median income (respectively £1600 and £2622). Hence, the higher income groups might be underrepresented in this study. Furthermore, more cases are present in the urban area than in the rural area, making the rural area less well represented.

A second limitations is the definition of urban and rural provided by Understanding Society. A respondent is considered to live in an urban area when the settlement has a population of ≥ 10,000. This means that both large cities (e.g. London, Edinburgh) and smaller towns are considered to be urban. It would have been interesting to study whether there would be differences when considering small rural settlements, villages, small towns and cities, but this was not possible.

The third issue is the use of median income. Apart from the fact that median income is sensitive to outliers, using median income as a 'border' in data does not tell much about the specific situation of people. It remains unknown how much more/less than median income is earned, while this could lead to differences in (determinants of) subjective wellbeing.

For future research, it is interesting to study the influence of social ties on subjective wellbeing, in addition to current determinants, and whether or not this differs between urban and rural areas. Keeping the COVID-19 crisis and its lockdowns in mind makes this even more interesting, since social ties might have become even more important. Consequently, it is also interesting to conduct a similar research studying the year(s) 2020 and/or 2021, as the possible results of the COVID-19 crisis and/or lockdowns might influence or change what determines a persons' subjective wellbeing.

References

Ball, R., & Chernova, K. (2008). Absolute income, relative income, and happiness. *Social Indicators Research, 88*, 497-529.

Ballas, D. (2013). What makes a 'happy city'? *Cities, 32*, 39-50.

Ballas, D. (2018). The economic geography of happiness. In K. F. Zimmerman (Ed.), *Handbook of labor, human resources and population economics* (1st ed., pp. 1-24). Cham: Springer.

Ballas, D., & Tranmer, M. (2012). Happy people or happy places? A multilevel modeling approach to the analysis of happiness and well-being. *International Regional Science Review, 35*(1), 70-102.

Blanchflower, D. G., & Oswald, A. J. (2004). Well-being over time in Britain and the USA. *Journal of Public Economics, 88*(7-8), 1359-1386.

Blanchflower, D. G., & Oswald, A. J. (2008). Is wellbeing U-shaped over the life cycle? *Social Science & Medicine, 66*(8), 1733-1749.

Burger, M., Meijers, E. J., & Van Oort, F. G. (2014). Regional spatial structure and retail amenities in the Netherlands. *Regional Studies, 48*(12), 1972-1992.

Burger, M., Morrison, P., S., Hendriks, M., & Hoogerbrugge, M. (2020). Urban-rural happiness differentials across the world. *The World Hapiness Report 2020*, 68-93.

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

Buttrick, N. R., & Oishi, S. (2017). The psychological consequences of income inequality. *Social and Personality Psychology Compass, 11*, e12304.

Clark, A. (2003). Unemployment as a social norm: Psychological evidence from panel data. *Journal of Labor Economics, 21*, 324-351.

Clark, A., & Oswald, A. J. (1994). Unhappiness and unemployment. *The Economic Journal, 104*(424), 648-659.

Dolan, P., Peasgood, T., & White, M. (2007). Do we really know what makes us happy? A review of the literature on the factors associated with subjective wellbeing. *Journal of Economic Psychology, 29*, 94-122.

Easterlin, R. A. (1974). Does economic growth improve the human lot? Some empirical evidence. *Nations and Households in Economic Growth, *, 89-125.

Easterlin, R. A., McVey, L. A., Switek, M., Sawangfa, O., & Zweig, J. S. (2010). The happiness-income paradox revisted. *Proceedings of the National Academy of Sciences, 107*, 22463-22468.

Ekici, T., & Koydemir, S. (2016). Income expectations and happiness: Evidence from British Panel Data. *Applied Research Quality Life, 11*, 539-552.

FitzRoy, F. R., & Nolan, M. A. (2020). Education, income and happiness: panel evidence for the UK. *Empirical Economics, 58*, 2573-2592.

Fournier, M. A. (2020). Dimensions of human hierarchy as determinants of health and happiness. *Current Opinion in Psychology, 33*, 110-114.

Frey, B., & Stutzer, A. (2002). *Happiness and economics*. Princeton: Princeton University Press.

Gerdtham, U., & Johannesson, M. (2001). The relationship between happiness, health, and socio-economic factors: Results based on Swedish microdata. *Journal of Socio-Economics, 30*(6), 553-557.

Gu, Y., & Wei, H. (2018). Significant indicators and determinants of happiness: Evidence from a UK survey and revealed by a data-driven systems modelling approach. *Social Sciences, 7*(53), 1-12.

Hoogerbrugge, M., & Burger, M. (2021). Selective migration and urban-rural differences in subjective well-being: Evidence from the United Kingdom. *Urban Studies, ,* 1-18.

Lenzi, C., & Perucca, G. (2018). Are urbanized areas source of life satisfaction? Evidence from EU regions. *Regional Studies, 97*(1), 1-19.

Luttmer, E. F. P. (2005). Neighbors as negatives: Relative earnings and well-being. *The Quarterly Journal of Economics, 120,* 963-1002.

Morrison, P. S. (2018). Resolving the urban paradox: subjective wellbeing, education and the big city. *Promotion of Quality of Life in the Changing World. 16th Annual Meeting of the International Society for Quality of Life Studies.* The Hong Kong Polytechnic University, Kowloon, Hong Kong.

Office for National Statistics. (2019). Employee earnings in the UK: 2019. Retrieved from https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/bulletins/annualsurveyofhoursandearnings/2019

Oishi, S., & Kesebir, S. (2015). Income inequality explains why economic growth does not always translate to an increase in happiness. *Psychological Science, 26*(10), 1630-1638.

Peiró, A. (2006). Happiness, satisfaction and socio-economic conditions: Some international evidence. *The Journal of Socio-Economics, 35*(2), 348-365.

Sarracino, F. (2013). Determinants of subjective well-being in high and low income countries: Do happiness equations differ across countries? *The Journal of Socio-Economics, 42*, 51-66.

Shucksmith, M., Cameron, S., Merridew, T., & Pichler, F. (2009). Urban-rural differences in quality of life across the European Union. *Regional Studies, 43*(10), 1275-1289.

Sorensen, J. F. L. (2014). Rural-urban differences in life satisfaction: Evidence from the European Union. *Regional Studies, 48*(9), 1451-1466.

Understanding Society. (2021a). Derived variables: Income and other. Retrieved from https://www.understandingsociety.ac.uk/documentation/mainstage/user-guides/main-survey-user-guide/derived-variables-income-and-other

Understanding Society. (2021b). Main survey variable search. Retrieved from
https://www.understandingsociety.ac.uk/documentation/mainstage/dataset-documentation

Understanding Society. (2021c). Main survey variable search: General health (scsf1). Retrieved from
https://www.understandingsociety.ac.uk/documentation/mainstage/dataset-documentation/variable/scsf1

Understanding Society. (2021d). Main survey variable search: Level of education (hiqual_dv).
Retrieved from https://www.understandingsociety.ac.uk/documentation/mainstage/dataset-documentation/variable/hiqual_dv

Understanding Society. (2021e). Main survey variable search: Subjective well-being (GHQ) - Likert.
Retrieved from https://www.understandingsociety.ac.uk/documentation/mainstage/dataset-documentation/variable/scghq1_dv

Understanding Society. (2021f). Main survey variable search: Urban or rural area, derived (urban_dv).
Retrieved from https://www.understandingsociety.ac.uk/documentation/mainstage/dataset-documentation/variable/hiqual_dv

Understanding Society. (n.d.). The UK Household Longitudinal Study. Retrieved from
https://www.understandingsociety.ac.uk/

Veenhoven, R. (1994). How satisfying is rural life? In J. Cecora (Ed.), *Changing values and attitudes in family households, with rural peer groups, social networks and action spaces* (pp. 4-52). Bonn: Society for Agricultural Policy and Rural Sociology.

Wilkinson, R. G., & Pickett, K. E. (2006). Income inequality and population health: A review and explanationof the evidence. *Social Science & Medicine, 62*(7), 1768-1784.

Dependent variable

Variable	Variable name		Value labels	Value
Subjective wellbeing	scgh1_dv	This measure converts valid answers to 12 questions of the General Health Questionnaire (GHQ) to a single scale by recoding so that the scale for individual variables runs from 0 to 3 instead of 1 to 4, and then summing, giving a scale running from 0 (the least distressed) to 36 (the most distressed). See Cox, B.D et al, The Health and Lifestyle Survey. (London: Health Promotion Research Trust, 1987).		

Independent variables

Variable	Variable name		Value labels	Value
Income: total monthly personal income gross	fimngrs_dv	Derived from income questions in survey	Missing [Value >= 0]	-9 1
Age	Doby_dv	Derived from the sample member's latest enumeration in the study		
Level of education	Hiqual_dv	Derived based on variable (QFHIGH: Can you tell me the highest educational or school qualification you have obtained)	Missing Inapplicable Degree Other higher degree A-level etc GCSE etc Other qualification No qualification	-9 -8 1 2 3 4 5 9
Satisfaction with health	Scsf1	In general, would you say your health is…	Missing Inapplicable Proxy Refusal Don't know Excellent Very good Good Fair Poor	-9 -8 -7 -2 -1 1 2 3 4 5

Economic activity (employment)	jbstat	Which of these best describes your current employment situation?	Refused	-2
			Don't know	-1
			Self employed	1
			Unemployed	2
			Retired	3
			On maternity leave	4
			Family care or home	5
			Full-time student	6
			LT sick or disabled	7
			Govt. training scheme	8
			Unpaid, family business	9
			On apprenticeship	10
			Doing something else	97
Gender	Sex_dv	Derived and cross-wave checked	Missing	-9
			Inconsistent	0
			Male	1
			Female	2
Urban or rural, derived	urban_dv	Binary indicator classifying the address as falling into an (1) urban or (2) rural area. This is derived from the Office for National Statistics Rural and Urban Classification of Output Areas 2001 (UKDS Study Number 7454). The indicator assumes a value of (1) if the address falls within urban settlements with a population of 10,000 or more, or (2) otherwise. Note that address information may not have been available, or incorrect. In those cases the indicator is set to missing/wild.	Missing	-9
			Urban area	1
			Rural area	2

Table 9: Understanding Society Variable Information (Understanding Society, n.d.)

Based on the 12 questions of the General Health Questionnaire (GHQ), subjective wellbeing is determined. The 12 questions are listed below (Understanding Society, 2021b).

1. Have you recently been able to concentrate on whatever you are doing?
2. Have you recently lost much sleep over worry?
3. Have you recently felt that you are playing a useful part in things?
4. Have you recently felt capable of making decisions about things?
5. Have you recently felt constantly under strain?
6. Have you recently felt you could not overcome your difficulties?
7. Have you recently been able to enjoy your normal day-to-day activities?
8. Have you recently been able to face up to your problems?
9. Have you recently been feeling unhappy and depressed?
10. Have you recently been losing confidence in yourself?
11. Have you recently been thinking of yourself as a worthless person?
12. Have you recently been feeling reasonably happy all things considered?

Appendix C: Data Management

Variable	Syntax (in Python)	Rationale	Number of observations dropped
Income	[(j_fimngrs_dv > 0)]	No negative score possible	1
Highest qualification (education)	[(j_hiqual_dv > 0)]	Scores below 1 indicate missing answers	625
Gender	[(j_sex_dv > 0)]	Scores below 1 indicate missing answers	4
General health	[(j_scsf1 > 0)]	Scores below 1 indicate missing answers	2085
Current economic activity	[(j_jbstat > 0)]	Scores below 1 indicate missing answers	43

Table 10: Data Management Overview