



Why are City Residents Less Happy than the Rest of the Population in Developed Countries? Studying the Urban-Rural Happiness Gap in Denmark Using Blinder-Oaxaca Decomposition

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Abstract

In Denmark, and in developed countries in general, urban residents tend to report lower subjective well-being than rural residents. This difference has been referred to as a happiness paradox as cities historically have pulled in residents from the countryside in what has become known as the rural exodus. This paper explores the urban-rural happiness gap in Denmark. Using the Danish Rural-Urban Survey administered in 2011/2012 ($n=2000$), the paper compares the respondents who live in the five largest cities in Denmark (Copenhagen, Aarhus, Odense, Aalborg, and Esbjerg) to the respondents who live in other parts of the country. The residents in the five largest cities report significantly lower life satisfaction than residents in the rest of the country. In contrast to evidence from other developed countries, this urban-rural happiness gap is found to be consistent across groups in the Danish society, e.g., across age, education, and employment groups. Further, the results show that the urban-rural happiness gap loses its statistical significance - and the two groups display similar satisfaction levels - when adjusting for several important factors. Decomposition analyses reveal that differences in urban-rural characteristics explain up to 94% of the urban-rural happiness gap. Of these urban-rural characteristics, lower access to nature amenities, lower bonding social capital, lower rates of retired people, and higher rates of non-native residents in the five largest cities in Denmark were found to account for up to 37%, 22%, 14%, and 9% of the urban-rural happiness gap, respectively.

Keywords Happiness paradox · Urban-rural happiness gap · Blinder-Oaxaca decomposition · Ethnic heterogeneity · Bonding social capital · Nature amenities · Denmark

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Introduction

Over the last decades, an increasing research interest has been put on the concept of self-reported, subjective well-being (SWB). At the national level, subjective well-being has been proposed as a supplement to the gross domestic product (GDP) when evaluating the ‘performance’ of nations (Stiglitz et al., 2009). Moreover, at the sub-national level, a large interest has been put into investigating regional differences in subjective well-being and the subjective well-being in the capital cities versus the rest of the country.

In the research at the subnational level, results have converged into concluding that subjective well-being is highest among people living in rural areas in developed countries and highest among people living in urban areas in developing countries. This is the conclusion that can be drawn from a rather long list of studies that examine rural-urban differences in subjective well-being around the world (Berry & Okulicz-Kozaryn, 2009; Easterlin et al., 2011; Requena, 2016), within the European Union (Sørensen, 2014; Lenzi & Perucca, 2018), as well as in individual countries, including Australia (Kubiszewski et al., 2018), Columbia (Burger et al., 2022), Denmark (Sørensen, 2021), Finland (Weckroth et al., 2022), Ireland (Brereton et al., 2008), New Zealand (Morrison, 2011), Romania (Lenzi & Perucca, 2016), Scotland (Gilbert et al., 2016; Dunlop et al., 2016), Sweden (Gerdtham & Johannesson, 2001), Turkey (Elburz et al., 2022), the United Kingdom (Hoogerbrugge & Burger, 2022), and the United States (Berry & Okulicz-Kozaryn, 2011; Winters & Li, 2017; Okulicz-Kozaryn, 2017, 2023).

The lower subjective well-being in urban areas in developed countries has been labelled a happiness paradox. The paradoxical aspect comes from two sources. Firstly, cities are often believed to be one the greatest inventions, as expressed in the much-cited work by Glaeser (2011) entitled “Triumph of the City: How Our Greatest Invention Makes Us Richer, Smarter, Greener, Healthier, and Happier”. The economist Glaeser points to agglomeration economies as a cause for the superiority of cities and whilst bold, his view is supported by the megatrend of rural-to-urban migration during the last century where cities have pulled in residents from the countryside in what has become known as the *rural exodus*. Secondly, as mentioned, research has shown that subjective well-being is higher in urban areas than in rural areas in developing countries (e.g., Easterlin et al., 2011; Requena, 2016), thus confirming the expectations under the first point.

A growing strand of literature has studied the reasons behind the urban-rural happiness gap in developed countries. Various angles have been used to study the phenomenon. Sørensen (2014) finds that social capital explains some of the lower urban life satisfaction within the EU. Morrison and Weckroth (2018) find that differences in human values explain a minor portion of the lower subjective well-being in Helsinki, the capital city of Finland. Piper (2015) finds that controlling for social contact and the fear of crime does not eliminate the lower life satisfaction in 16 European capital cities. This is in line with the finding of Okulicz-Kozaryn and Mazelis (2018) that urban unhappiness still exists after controlling for urban problems in the US such as crime, poverty, and low social contact. Sørensen (2021) finds that controlling for access to nature amenities and bonding social capital removes the excess life

satisfaction in rural and peripheral areas in Denmark. Weckroth et al. (2022) find that the negative effect of inner urban living on quality of life becomes insignificant when controlling for several mental health indicators, such as depression, anxiety, and loneliness. Based on the case of Norway, Carlsen and Leknes (2022) advance the notion that urban expansion and lower urban life satisfaction is powered by population heterogeneity in particular by the presence of highly mobile citizens preferring urban life and less mobile citizens preferring rural life. According to their argument, most young people are mobile, and they thus migrate to urban or capital areas. Later in life, their preferences change for calmer and more rural living but the advantage of moving to rural areas later in life does not outweigh the disadvantages because of the social networks, including own children, that they have established during their years in the city. Finally, and somewhat related, Hoogerbrugge and Burger (2022, p. 2092) find selective migration to explain some of the urban-rural difference in life satisfaction in the UK, for example by finding that “a move from the countryside to the city is positively associated with the life satisfaction of students while it is negatively associated with the life satisfaction of people with a non-tertiary education”.

This paper explores the urban-rural happiness gap in Denmark. Based on a unique survey, the Danish Rural-Urban Survey ($n=2000$), which was co-administered by the author in 2011/2012, the paper will look for factors behind the lower life satisfaction in the five largest cities in Denmark as compared to the rest of the country. Denmark is a suitable case study, as various studies have confirmed the higher rural life satisfaction in this country (Sørensen, 2018, 2021; Lolle, 2023). Drawing on the same dataset, the paper is an extension of Sørensen (2021). The paper offers several new contributions to the international literature by: (1) investigating *ethnic heterogeneity* as a possible determinant behind the urban-rural happiness gap, which has not been done before in previous studies, (2) exploring whether the relationship between place of living (urban-rural) and happiness is heterogeneous across groups in the Danish society, and (3) employing the Blinder-Oaxaca decomposition method, which enables the determination of how much single factors contribute to the Danish urban-rural happiness gap.

Theory

To try to explain the urban-rural happiness gap in Denmark, the paper focuses on ethnic heterogeneity, bonding social capital (Sørensen, 2014, 2021) and access to nature amenities (Sørensen, 2021).

Population heterogeneity in cities, which leads to alienation and isolation according to Wirth (1938), might come in the form of *ethnic heterogeneity*. In this connection, Putnam (2007) found that ethnic heterogeneity in a community drives down interpersonal trust and thus subjective well-being within the US. By quantitatively analyzing communities with different levels of ethnic homogeneity in the US, Putnam (2007) found that low levels of ethnic homogeneity are associated not only with large out-group distrust (distrusting people from another ethnic groups than your own) but also with large in-group distrust (distrusting people from your own ethnic group). Putnam (2007) spoke of the ‘turtle’ or ‘hunkering down’ effect in multicultural com-

munities, meaning that people in multicultural communities tend to hunker down and keep to themselves, with accompanying negative effects on well-being. As ethnic heterogeneity is most pronounced in large cities in developed countries, larger ethnic heterogeneity in cities may contribute to the lower urban happiness in developed countries.

Putnam (2000) coined the term *bonding social capital* along with the term bridging social capital. Whereas bonding social capital refers to connections between individuals who know each other, bridging social capital refers to connections between individuals who do not. The two terms can be said to be similar to Granovetter's (1973) terminology of 'strong ties' and 'weak ties', as well as similar to the two forms of trust put forward by Uslaner (2003): strategic trust (trust in specific people based on experience) and moralistic trust (trust in people you do not know). Classical sociologists such as Tönnies (1887 [1957]) and Wirth (1938) would predict bonding social capital to be higher in rural areas, which in turn could drive up rural well-being. For example, Wirth (1938) argued that the population size, the population density, and the population heterogeneity in cities produce social disorganization and social withdrawal. A game theoretic argumentation for higher bonding social capital in rural areas can also be made. In small groups, there are many repeated games and cheating will become visible and instantly be communicated on to the group. Out of fear of social sanctions, cheating is kept at a minimum. In cities, one can easily replace one's main group affiliation. The new group will have no knowledge of previous acts of cheating.

Higher *access to nature amenities* in rural areas is likely to contribute to the higher rural life satisfaction in developed countries. Thus, the effect of exposure to nature has been studied rigorously in several *experimental* studies emanating from the field of environmental psychology, and they all show that spending time in natural environments reduces stress and mental fatigue (e.g., Hartig et al., 2003; Van den Berg et al., 2003). Moreover, both experimental studies (e.g., Tyrväinen et al., 2014; Hedblom et al., 2019) and observational studies (e.g., Scopelitti et al., 2016; Ambrey & Fleming, 2014; Coldwell & Evans, 2018; Sørensen, 2021) have shown that access to green areas in cities promotes subjective well-being among urbanites.

Methodically, this paper will use regression analysis and Blinder-Oaxaca decomposition analysis. The latter is used for analyzing the underlying factors behind differences between two groups and is therefore suitable for analyzing the urban-rural happiness gap. Using decomposition analyses is fairly new in the literature dealing with rural-urban differences in subjective well-being. So far, only Burger et al. (2022) have used it to analyze the higher urban subjective well-being in a developing country, Columbia.

Data and Methodology

This paper will draw on data from the Danish Rural-Urban Survey (DRUS) ($n=2000$), which the author of this paper co-administered in 2011/2012. DRUS was administered among residents in Denmark who were aged eighteen and above, for a detailed description of the survey, see Sørensen, 2015.

Subjective well-being will be measured by life satisfaction, which is seen as the cognitive component of subjective well-being (e.g., Diener et al., 2003). The life satisfaction item in DRUS is phrased in the same way as in the World Values Survey, namely: “All things considered, how satisfied are you with your life as a whole these days?” Respondents could answer on a scale from 1 to 10, where 1 means ‘dissatisfied’ and 10 means ‘satisfied’.

As its central geographical variable, the paper will use a variable that divides the respondents into those living in one of the five largest cities in Denmark, coded 1, and those living in the rest of Denmark, coded 0. The five largest cities in Denmark are the following (number of inhabitants as of January 1, 2012, in parentheses): Copenhagen (1,213,822), Aarhus (252,213), Odense (168,798), Aalborg (104,885), and Esbjerg (71,579). They made up about 32% of the entire Danish population as of January 1, 2012 (1.8 out of 5.6 million inhabitants).¹ Until recently, there has been no generally recognized definition on what constitutes a city in terms of the lower boundary population size. Thus, national definitions have differed considerably, and this has made cross-country comparisons difficult. In 2020, however, with the aim of creating a unified definition and thus meeting this challenge, six international organizations (European Union, ILO, FAO, OECD, UN-Habitat, World Bank)² agreed upon and endorsed a common definition, the so-called *Degree of Urbanization* (Commission, 2020; Dijkstra et al., 2020). The Degree of Urbanization identifies three types of settlements: (1) *Cities*, which have a population of at least 50,000 inhabitants in contiguous dense grid cells ($> 1,500$ inhabitants per km^2), (2) *Towns and semi-dense areas*, which have a population of at least 5,000 inhabitants in contiguous grid cells with a density of at least 300 inhabitants per km^2 , and (3) *Rural areas*, which consist mostly of low-density grid cells (< 300 inhabitants per km^2) (Dijkstra et al., 2020). Using the term city in this paper to label the five largest settlements in Denmark is consistent with the Degree of Urbanization as the five largest settlements in Denmark had at least 71,000 inhabitants (Esbjerg) and a population density of at least 1,600 inhabitants per km^2 (Esbjerg) per January 1, 2012.³

As mentioned in the introduction, this paper will pay special attention to the following three factors as potential contributors to the urban-rural happiness gap in developed countries: Ethnic heterogeneity, bonding social capital, and access to nature amenities. As a proxy measure for *ethnic heterogeneity*, a dummy variable on whether the respondent was born in Denmark or not is used. The information on the place of birth was obtained from Statistics Denmark who delivered the representative population extracts used to carry out the data collection. *Bonding social capital* is measured by a dummy variable on whether the respondent totally agrees in the following statement in the DRUS or not: “You feel that you have a strong solidarity with the other people who live in your local community”. *Access to nature amenities*

¹ These population figures were retrieved from Statistics Denmark: <https://statbank.dk/by1> (accessed November 23, 2023).

² ILO is short for the International Labour Office, FAO is short for the Food and Agriculture Organization of the United Nations, OECD is short for the Organization for Economic Co-operation and Development, and UN-Habitat is short for the United Nations Human Settlements Program.

³ Based on information retrieved from Statistics Denmark: <https://statbank.dk/by1> (accessed November 23, 2023) and <https://statbank.dk/by3> (accessed June 6, 2024).

is measured by the following item in the DRUS: “Are there many nature amenities within and around your local community?” The question could be answered on a scale from 1 to 10, where 1 means ‘none at all’ and 10 means ‘very many’.

In addition, the following socio-economic control variables will be included in the analyses: gender, age, age squared, self-reported health, civil status, number of children, education, employment status, and yearly gross household income per head of household. Table 1 shows a detailed variable list.

Table 1 Variables and definitions

Variable	Definition
Life satisfaction	Ten-point scale from 1 to 10, where 1=dissatisfied with my life as a whole these days; and 10=satisfied with my life as a whole these days
Five largest cities	1=Lives in Copenhagen, Aarhus, Odense, Aalborg, or Esbjerg; 0=otherwise
Female	1=Female; 0=Male
Age	Age as continuous variable
Fair, poor, or very poor health	1=Fair, poor, or very poor health; 0=otherwise
Good health	1=Good health; 0=otherwise
Very good health	1=Very good health; 0=otherwise
Has no partner	1=Single, widow/widower, separated or divorced; 0=otherwise
Has a partner	1=Married or registered partnership; 0=otherwise
No children	1=No children living at home; 0=otherwise
One child	1=One child living at home; 0=otherwise
Two children	1=Two children living at home; 0=otherwise
Three or more children	1=Three or more children living at home; 0=otherwise
Only primary school	1=Only primary school; 0=otherwise
Secondary school	1=Secondary school; 0=otherwise
Vocational education	1=Vocational education; 0=otherwise
Short higher education	1=Short higher education; 0=otherwise
Medium higher education	1=Medium higher education; 0=otherwise
Long higher education	1=Long higher education; 0=otherwise
Wage earner	1=Wage earner; 0=otherwise
Self-employed	1=Self-employed; 0=otherwise
Unemployed	1=Unemployed; 0=otherwise
Student	1=Student; 0=otherwise
Retired	1=Retired; 0=otherwise
Other employment	1=Other employment; 0=otherwise
Gross yearly income	Yearly gross household income per head of household in 1000 Danish Kroner (DKK)
Born in Denmark	1=Born in Denmark; 0=otherwise
Strong solidarity	Agreement with the statement: “You feel that you have a strong solidarity with the other people who live in your local community”. 1=totally agree; 0=agree in part; 0=neither disagree nor agree; 0=disagree in part; 0=totally disagree
Nature amenities	Response to the question: “Are there many nature amenities within and around your local community?” Measured on a 10-point scale, where 1=none at all; and 10=very many

Statistical Methods

Two statistical methods will be used: OLS (ordinary least squares) regression and Blinder-Oaxaca decomposition. As for the first, the subjective well-being function basic will be estimated:

$$W_i = \alpha + \beta X_i + \varepsilon \quad (1)$$

where W_i is the subjective well-being of individual i , X_i is the vector of independent variables, and ε is the error term.

The regressions will be performed for a working sample comprising of the respondents who answered all the survey items included in the analyses ($n=1417$). In this way, all regressions will be based on the same sample size. In the analysis of factors that contribute to the urban-rural happiness gap in Denmark, five regressions will be performed. In the first regression, only the city variable will be entered (Model 1). In the second regression, the socioeconomic control variables will be added (Model 2). In the third, fourth, and fifth regression, ethnic heterogeneity, bonding social capital, and access to nature amenities will be added, respectively (Models 3–5). Additionally, four robustness tests will be performed.

In an analysis of whether the relationship between place of living (urban-rural) and happiness is heterogeneous across groups in society, interaction effects between city residence and socioeconomic characteristics (age 18–29, age 60+, having a partner, having no children, primary school as highest education, long-term higher education as highest education, wage earner, self-employed, unemployed, student, retired, income) will be included one by one in separate regressions.

The Blinder-Oaxaca decomposition (Blinder, 1973; Oaxaca, 1974) decomposes the gap in mean outcomes across two groups into two parts: a part that is due to differences in group characteristics (the explained part) and a part that cannot be explained by such differences (the unexplained part). Specifically, the difference between the subjective well-being in the two areas is expressed as:

$$\bar{W}_A - \bar{W}_B = \left[\hat{\beta}_A \left(\bar{X}_A - \bar{X}_B \right) \right] + \left[\bar{X}_B \left(\hat{\beta}_A - \hat{\beta}_B \right) \right] \quad (2)$$

where $\bar{W}_A - \bar{W}_B$ is the difference in the average levels of subjective well-being in the two areas, A and B, respectively; $\hat{\beta}_A$ and $\hat{\beta}_B$ are the vectors of coefficients estimated using ordinary least squares regression with the respondents located respectively in the areas A and B; and \bar{X}_A and \bar{X}_B are the vectors of the average values of the observed characteristics for respondents located respectively in the areas A and B. The first term on the right-hand side of Eq. (2), $\left[\hat{\beta}_A \left(\bar{X}_A - \bar{X}_B \right) \right]$, captures the explained part: the part of the difference that is due to differences in characteristics between the two areas. The second term, $\left[\bar{X}_B \left(\hat{\beta}_A - \hat{\beta}_B \right) \right]$, is the unexplained part: the part of the difference that is due to differences in the estimated coefficients. In this paper, area A is comprised of the five largest cities in Denmark, and area B is comprised of the remaining part of Denmark outside the five largest cities.

Descriptive Statistics

Table 2 shows the descriptive statistics for the full DRUS sample as well as for the working sample. As mentioned, the working sample consists of the 1417 respondents who answered all the survey items included in the analyses. As can be seen in Table 2, it is the income variable that mainly reduces the working sample from 2000 to 1417 respondents. The respondents were asked to specify their exact household income in Danish Kroner, and a large share of the respondents either did not want to or could not provide an answer. In general, the descriptive statistics report a high level of life satisfaction: a mean of 8.66 and a standard deviation of 1.51 in the working sample. This high level of life satisfaction could be expected, as Denmark is known for being among the top-ranked countries in the world when it comes to happiness.

Table 2 Descriptive statistics

	Full sample				Working sample (<i>n</i> =1417)		
	<i>n</i>	Mean	SD	Min/ Max	Mean	SD	Min/ Max
Life satisfaction	1993	8.61	1.58	1/10	8.66	1.51	1/10
Five largest cities	2000	0.18	0.39	0/1	0.18	0.39	0/1
Female	2000	0.53	0.50	0/1	0.50	0.50	0/1
Age	2000	52.79	16.58	18/100	52.81	15.01	18/90
Fair, poor, or very poor health	1997	0.23	0.42	0/1	0.22	0.41	0/1
Good health	1997	0.38	0.49	0/1	0.39	0.49	0/1
Very good health	1997	0.39	0.49	0/1	0.39	0.49	0/1
Has no partner	2000	0.40	0.49	0/1	0.36	0.48	0/1
Has a partner	2000	0.60	0.49	0/1	0.64	0.48	0/1
No children	1997	0.70	0.46	0/1	0.68	0.47	0/1
One child	1997	0.11	0.32	0/1	0.12	0.32	0/1
Two children	1997	0.13	0.34	0/1	0.15	0.35	0/1
Three or more children	1997	0.05	0.23	0/1	0.06	0.24	0/1
Only primary school	1931	0.14	0.35	0/1	0.11	0.31	0/1
Secondary school	1931	0.04	0.20	0/1	0.03	0.18	0/1
Vocational education	1931	0.33	0.47	0/1	0.34	0.47	0/1
Short higher education	1931	0.11	0.32	0/1	0.11	0.31	0/1
Medium higher education	1931	0.26	0.44	0/1	0.27	0.45	0/1
Long higher education	1931	0.13	0.33	0/1	0.13	0.34	0/1
Wage earner	1994	0.52	0.50	0/1	0.57	0.50	0/1
Self-employed	1994	0.06	0.24	0/1	0.06	0.24	0/1
Unemployed	1994	0.03	0.17	0/1	0.03	0.16	0/1
Student	1994	0.05	0.21	0/1	0.04	0.19	0/1
Retired	1994	0.32	0.47	0/1	0.30	0.46	0/1
Other employment	1994	0.01	0.12	0/1	0.00	0.06	0/1
Gross yearly income (1000 DKK)	1483	322	300	65/400	327	305	65/4000
Born in Denmark	2000	0.96	0.21	0/1	0.97	0.18	0/1
Strong solidarity	1988	0.39	0.49	0/1	0.39	0.49	0/1
Nature amenities	1984	8.16	2.00	1/10	8.18	2.01	1/10

Note: SD=standard deviation

In Table 3, the descriptive statistics are shown for the two geographical areas separately. First of all, the life satisfaction is significantly lower in the five largest cities in Denmark than in the rest of Denmark. The difference of -0.321 is highly significant (two-tailed t -test: $t=2.94$, $p=0.0033$). Moreover, as could be expected, there are significantly more single people and significantly more people with a long-term higher education among the respondents from the five largest cities. Moreover, the respondents from outside the five largest cities report a significantly higher percentage of

Table 3 Difference between the five largest cities in Denmark and the rest of Denmark ($n=1417$)

	Five largest cities	Rest of Denmark	Difference
Life satisfaction	8.377 (0.100)	8.690 (0.045)	-0.312***
Female	0.603 (0.031)	0.496 (0.015)	0.107***
Age	48.786 (1.030)	53.478 (0.433)	-4.692***
Fair, poor, or very poor health	0.222 (0.026)	0.218 (0.012)	0.004
Good health	0.350 (0.030)	0.397 (0.014)	-0.047
Very good health	0.428 (0.031)	0.384 (0.014)	0.044
Has a partner	0.459 (0.031)	0.672 (0.014)	-0.212***
No children	0.693 (0.029)	0.677 (0.014)	0.016
One child	0.121 (0.020)	0.116 (0.009)	0.005
Two children	0.148 (0.022)	0.144 (0.010)	0.004
Three or more children	0.039 (0.012)	0.064 (0.007)	-0.025
Only primary school	0.070 (0.016)	0.125 (0.10)	-0.055**
Secondary school	0.074 (0.016)	0.026 (0.005)	0.048***
Vocational education	0.210 (0.025)	0.361 (0.014)	-0.151***
Short higher education	0.093 (0.018)	0.116 (0.009)	-0.022
Medium higher education	0.284 (0.028)	0.268 (0.013)	0.016
Long higher education	0.268 (0.028)	0.104 (0.009)	0.164***
Wage earner	0.615 (0.030)	0.558 (0.015)	0.057*
Self-employed	0.043 (0.013)	0.064 (0.007)	-0.021
Unemployed	0.027 (0.010)	0.025 (0.005)	0.002
Student	0.089 (0.018)	0.026 (0.005)	0.064***
Retired	0.222 (0.026)	0.323 (0.014)	-0.101***
Other employment	0.004 (0.004)	0.004 (0.002)	-0.000
Gross yearly income (1000 DKK)	328.191 (18.651)	326.215 (8.985)	1.976
Born in Denmark	0.938 (0.015)	0.972 (0.005)	-0.035***
Strong solidarity	0.226 (0.026)	0.422 (0.015)	-0.197***
Nature amenities	7.319 (0.140)	8.345 (0.056)	-1.026***
Number of observations	257	1160	

Notes: Standard errors in parentheses. Two-sample t -tests for equality of means were performed
 *** $p<0.01$ (two-tailed), ** $p<0.05$ (two-tailed), * $p<0.10$ (two-tailed)

being born in Denmark, a significantly higher level of bonding social capital, and a significantly higher level of access to nature amenities.

Results

This section presents and discusses the results of the OLS regression analyses as specified in Eq. (1) in terms of the identified correlates of life satisfaction in Denmark, and it presents the results of the Blinder-Oaxaca decomposition analysis as specified in Eq. (2) with a view to explaining and urban-rural happiness gap in Denmark.

Predictors of Life Satisfaction in Denmark

Table 4 shows the results from the OLS regression analyses. The urban-rural happiness gap still exists after including the socioeconomic variables in Model 2. However, the coefficient for the five largest cities is reduced substantially. In Model 3, born in Denmark is added, and as expected, the variable is positively associated with life satisfaction (at the 0.1% significance level). However, even though the negative coefficients for the five largest cities is slightly reduced, the inclusion of the variable does not make the urban-rural happiness gap disappear. In Model 4, bonding social capital is added. The variable is positively associated with life satisfaction at the 0.1% significance level, and when adding the variable, the urban-rural happiness gap ceases to be statistically significant, cf. the coefficient for the five largest cities. Finally, when adding nature amenities in Model 5 the coefficient for the five largest cities is reduced even further. As expected, access to nature amenities is positively associated with life satisfaction (at the 0.1% significance level). Overall, the regression analyses suggest that a higher percentage of people having been born outside Denmark, proxying ethnic heterogeneity, lower bonding social capital and lower access to nature amenities in the five largest cities in Denmark are among the likely factors to explain the lower life satisfaction in the five largest cities in Denmark.

Table 5 shows the results of four robustness checks. The first robustness check excludes income, the second robustness check excludes income and includes a dummy for not responding to income, the third robustness check controls for fixed effects at the municipal level, and the fourth robustness check controls for fixed effects at the regional level.

The result in the main regression ended in an insignificant coefficient of -0.095 for the five largest cities, see Table 4, Model 5. As can be seen the Table 5, the four robustness checks also produce insignificant coefficients for the five largest cities ranging from -0.053 to -0.152. In other words, the robustness checks produce the same results as the main regression model.

Between-Group Heterogeneity

Previous results showed that city residence is negatively related to happiness both in the raw figures and when adjusted for socioeconomic factors, see Table 4, Model 1 and 2. To investigate whether the relationship between city residence and happi-

Table 4 Predictors of life satisfaction

	Model 1	Model 2	Model 3	Model 4	Model 5
Living area					
Five largest cities	-0.312 (-2.94)***	-0.224 (-2.11)**	-0.208 (-1.96)**	-0.160 (-1.51)	-0.095 (-0.89)
Gender and age					
Female		0.064 (0.79)	0.071 (0.87)	0.098 (1.22)	0.070 (0.87)
Age		-0.017 (-0.89)	-0.015 (-0.80)	-0.015 (-0.81)	-0.018 (-0.97)
Age ²		0.0003 (1.58)	0.0003 (1.43)	0.0002 (1.40)	0.0003 (1.52)
Health					
Fair, poor, or very poor (reference)					
Good		0.620 (5.74)***	0.606 (5.64)***	0.586 (5.49)***	0.582 (5.47)***
Very good		1.134 (10.29)***	1.129 (10.30)***	1.105 (10.14)***	1.084 (9.98)***
Family and children					
Has a partner		0.258 (2.84)***	0.259 (2.86)***	0.247 (2.75)***	0.223 (2.49)**
No children (reference)					
1 child		-0.036 (-0.27)	-0.043 (-0.33)	-0.061 (-0.46)	-0.051 (-0.38)
2 children		-0.071 (-0.54)	-0.096 (-0.74)	-0.123 (-0.95)	-0.119 (-0.92)
3 or more children		-0.063 (-0.34)	-0.092 (-0.50)	-0.091 (-0.50)	-0.102 (-0.56)
Education					
Primary school (reference)					
Secondary school		0.105 (0.41)	0.196 (0.78)	0.172 (0.69)	0.154 (0.62)
Vocational education		-0.101 (-0.74)	-0.095 (-0.70)	-0.080 (-0.59)	-0.121 (-0.90)
Higher education, short		-0.113 (-0.67)	-0.103 (-0.61)	-0.097 (-0.58)	-0.123 (-0.74)
Higher education, medium		-0.200 (-1.40)	-0.171 (-1.20)	-0.128 (-0.90)	-0.179 (-1.26)
Higher education, long		-0.043 (-0.26)	0.006 (0.04)	0.080 (0.48)	0.027 (0.16)
Employment status					
Wage earner (reference)					
Self-employed		0.096 (0.57)	0.097 (0.58)	0.114 (0.69)	0.117 (0.71)
Unemployed		-0.946 (-3.76)***	-0.794 (-3.14)***	-0.770 (-3.07)***	-0.766 (-3.07)***
Student		-0.167 (-0.63)	-0.164 (-0.63)	-0.093 (-0.36)	-0.059 (-0.23)

Table 4 (continued)

	Model 1	Model 2	Model 3	Model 4	Model 5
Retired		0.183 (1.34)	0.201 (1.48)	0.182 (1.34)	0.166 (1.23)
Other employment		0.382 (0.63)	0.343 (0.57)	0.263 (0.44)	0.234 (0.39)
Income					
Gross yearly income (1000 DKK)		0.0001 (0.94)	0.0001 (0.71)	0.0001 (0.50)	0.00004 (0.32)
Place of birth					
Born in Denmark			0.919 (4.19)***	0.932 (4.28)***	0.910 (4.20)***
Solidarity within local community					
Strong solidarity				0.361 (4.43)***	0.342 (4.21)***
Nature amenities in local community					
Nature amenities					0.074 (3.67)***
Model					
Adjusted R^2	0.005	0.104	0.114	0.126	0.134
Number of observations	1417	1417	1417	1417	1417

Notes: Ordinary least squares (OLS) regressions with life satisfaction (on a 10-point scale) as dependent variable. t -statistics in parentheses. *** $p < 0.01$ (two-tailed), ** $p < 0.05$ (two-tailed)

Table 5 Main regression results and robustness checks

	Baseline	Without income	Without income and with dummy for non-response to income	With municipality dummies	With regional dummies
	Model 1	Model 2	Model 3	Model 4	Model 5
Five largest cities	-0.095 (-0.89)	-0.119 (-1.28)	-0.119 (-1.28)	-0.152 (-0.44)	-0.053 (-0.43)
Income non-response			-0.001 (-0.02)		
Adjusted R^2	0.134	0.143	0.142	0.118	0.133
Number of observations	1417	1881	1881	1417	1417

Notes: Ordinary least squares (OLS) regressions with life satisfaction (on a 10-point scale) as dependent variable. The same control variables as in Table 4, Model 5, are included in all estimations. *t*-statistics in parentheses

ness is heterogenous across groups, interaction effects were included separately in Table 6. The results in Table 6 show no signs of between-group heterogeneity. In other words, the negative relationship between city residence and happiness applies for all groups. One group stands out though. Thus, the group of unemployed are significantly more dissatisfied with living in cities than other employment groups. This may be due to the higher cost of living in urbanized areas. Overall, the results differ somewhat from the results found in previous studies. Using US data, Okulicz-Kozaryn and Valente (2019) find that in contrast to other generations the latest generation called ‘Millennials’ (born 1982–2004) are happiest in large cities. In this study, by contrast, young people in the age group 18–29 feel happier when they live in areas outside the five largest cities in Denmark. Since the data was collected in 2011, this young age group holds Millennials born between 1982 and 1993. Moreover, based on UK data, Hoogerbrugge and Burger (2022) find that students and people with a tertiary education on average are happier in urban areas. As can be seen in Table 6, such heterogenous effects were not found in this study. Thus, the interaction effects attached to being a student, having only finished primary school, and having finished a long-term higher education were all found to be statistically insignificant.

Explaining the Urban-Rural Happiness Gap in Denmark

Using Blinder-Oaxaca decompositions, this section looks at how much of the urban-rural happiness gap can be explained by the various predictors of life satisfaction as identified above. The results of the explained part of the Blinder-Oaxaca decompositions are shown in Table 7. In the decompositions, only the variables that turned out to be statistically significant in the OLS regression analysis were included: health, civil status, employment status, born in Denmark, bonding social capital, and nature amenities. Moreover, analyses are done both for the working sample ($n=1417$) and for a larger sample ($n=1881$). The possibility to perform decomposition for the larger sample presented itself as income, having by far the lowest completion rate, turned out to be insignificant in the regression analysis. Since the two robustness checks

Table 6 Interaction effects between life satisfaction, city residence and socioeconomic characteristics

	Baseline	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Five largest cities (cities)	-0.224** (-2.11)	-0.227** (-2.05)	-0.219* (-1.74)	-0.202 (-1.35)	-0.248 (-1.34)	-0.186* (-1.68)	-0.279** (-2.33)	-0.338** (-2.02)	-0.176 (-1.63)	-0.186* (-1.70)	-0.258** (-2.11)	-0.225 (-1.44)
1. Cities x Age 18–29		0.028 (0.09)										
2. Cities x Age 60+			-0.017 (-0.07)									
3. Cities x Has a partner				-0.044 (-0.21)								
4. Cities x Has no children					0.035 (0.16)							
5. Cities x Primary school						-0.455 (-1.18)						
6. Cities x Long higher education							0.253 (1.01)					
7. Cities x Wage earner								0.187 (0.88)				
8. Cities x Unemployed									-1.753*** (-2.80)			
9. Cities x Student										-0.631 (-1.48)		
10. Cities x Retired											0.135 (0.56)	
11. Cities x Income												0.000 (0.01)
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.104	0.103	0.013	0.103	0.103	0.104	0.104	0.104	0.108	0.104	0.103	0.103
Number of observations	1417	1417	1417	1417	1417	1417	1417	1417	1417	1417	1417	1417

Notes: Ordinary least squares (OLS) regressions with life satisfaction (on a 10-point scale) as dependent variable. t -statistics in parentheses

*** $p < 0.01$ (two-tailed), ** $p < 0.05$ (two-tailed), * $p < 0.10$ (two-tailed)

considering the income variable did not change the main results of the OLS regression, it seems appropriate to include both those who reported their income and those who did not report their income in a decomposition analysis. The decomposition analysis identifies the variables that significantly explain the difference in life satisfaction between the respondents from the five largest cities and the respondent from the rest of Denmark outside the five largest cities.

Model 1 in Table 7 shows the results when using the working sample. The urban-rural gap is 0.321, and differences in observed characteristics explain about 80% of this gap. The decomposition reveals that the rural-urban gap is mostly explained by access to nature amenities (41%), bonding social capital (19%), retired (11%), born in Denmark (7%), although only the access to nature amenities variable is statistically significant.

Model 2 in Table 7 shows the results when using the larger sample. Here, the urban-rural gap is 0.351, and differences in observed characteristics now explain 94% of this gap. Again, the rural-urban gap is mostly explained by access to nature amenities (37%), bonding social capital (22%), retired (14%), and born in Denmark (9%), but now all these four variables are statistically significant.

The above result for retired people can be explained by the fact that there are less retired people living in the five largest cities than outside the five largest cities, see Table 3, and that being retired has a positive association with life satisfaction when age is excluded from the analysis.

Table 7 Decomposition of urban-rural difference in life satisfaction

	Model 1: Working sample (<i>n</i> = 1417)		Model 2: Full sample (<i>n</i> = 1881)	
	Coefficient (<i>z</i>)	Percent	Coefficient (<i>z</i>)	Percent
Explained: Due to difference in characteristics	-0.250 (-3.68)***	80.1	-0.329 (-5.73)***	93.7
Unexplained: Due to difference in coefficients	-0.062 (-0.51)	19.9	-0.022 (-0.21)	6.3
Raw difference	-0.312 (-3.12)***	100	-0.351 (-3.92)***	100
Due to differences in characteristics:				
Fair, poor, or very poor health (reference)				
Good health	-0.008 (-0.65)	2.5	-0.008 (-1.35)	2.2
Very good health	0.040 (3.62)***	-12.8	0.030 (4.49)***	-8.6
Has a partner	-0.001 (-0.03)	0.4	-0.036 (-1.11)	10.3
Wage earner (reference)				
Self-employed	-0.006 (-0.58)	1.8	-0.018 (-1.28)	5.1
Unemployed	-0.005 (-3.85)***	1.6	-0.001 (-3.77)***	0.2
Student	-0.028 (-1.28)	9.0	-0.013 (-0.69)	3.6
Retired	-0.035 (-1.40)	11.2	-0.048 (-2.14)**	13.6
Other employment	-0.0004 (-0.57)	0.1	-0.001 (-0.53)	0.4
Born in Denmark	-0.020 (-1.46)	6.5	-0.030 (-2.11)**	8.6
Strong solidarity within local community	-0.058 (-1.32)	18.6	-0.076 (2.27)**	21.7
Nature amenities in local community	-0.128 (-2.91)***	41.1	-0.129 (-2.97)***	36.7

Notes: Blinder-Oaxaca decomposition. Raw difference between the life satisfaction in the five largest cities in Denmark and the life satisfaction in the rest of Denmark. *** $p < 0.01$ (two-tailed), ** $p < 0.05$ (two-tailed)

In both models, being unemployed significantly explains some of the urban-rural gap, but only very little, cf. 1.6% and 0.2% in Model 1 and 2, respectively. As there are just as many unemployed in both areas, see Table 3, it may be seen as further evidence of the notion found in the group heterogeneity analysis above that being unemployed is more detrimental to life satisfaction if you live in one of the five largest cities in Denmark compared to if you live outside these cities in Denmark. Moreover, an interesting side result is that health *improves* the urban-rural life satisfaction gap, cf. the positive and significant coefficients for very good health. As the two groups did not significantly differ from each other in terms of health, see Table 3, it seems that having a very good health in cities has a higher positive effect on life satisfaction than having a very good health in areas outside the cities. One possible explanation could be that urban residents, at least in Denmark, will walk or take their bike when they run errands much more than rural residents because of proximity to private and public services (Carlson et al., 2018). This would mean that having a very good health is more benefitting to urban residents, since urban residents who have a very good health can run errands more easily without getting exhausting. Rural residents on their part are most often forced to transport themselves by car doing errands because of the longer distance to private and public services, and here transporting yourself from A to B is not made easier or more pleasant when having a very good health.

Conclusion and Discussion

Using a Danish survey, this paper found a lower life satisfaction among people in the five largest cities than among people in the rest of the country. This relationship between place of living and happiness was found to be homogeneous across socioeconomic groups, except for the group of unemployed people who get an extra happiness premium from living outside the five largest cities. Thus, based on the sample, no group in the Danish society is happier living in the five largest cities.

Blinder-Oaxaca decomposition analyses showed that the lower life satisfaction in the five largest cities is attributable to composition effects related to cities having more people with a non-Danish background (born outside Denmark), fewer retired people, lower bonding social capital, and lower access to nature amenities compared to other areas.

That people born outside Denmark report a lower life satisfaction than people born in Denmark may be due to their having a different norm, values, and belief system than the prevailing one in Denmark. In that sense, it may reflect the notion that creating multicultural societies is not necessarily a tool to fostering community and personal well-being, but rather the contrary (Putnam, 2007). To make further analyses, it would be relevant to differentiate between immigrant groups, but unfortunately, the sample used in this study does not hold any information on the national origin nor any information on the cultural, ethnic, or religious background of those who were born outside Denmark. These are limitations in this study.

There are no previous studies that have analyzed the impact of ethnic heterogeneity in connection with explaining the rural-urban happiness gap in developed

countries. This paper represents a first small step. Future studies can deal with the above-mentioned limitations. Moreover, in future studies, it would be beneficial to include countries that have higher shares of foreign-born residents than Denmark. For example, there are many European countries with large shares of immigrants who were born outside the EU, e.g. Belgium, the U.K., and Germany. One can mention cities like Brussels, London, Leicester, and Frankfurt am Main that have shares of immigrants born outside the EU that exceed 20% (Eurostat, 2016, p. 231).

This paper found that most of the urban-rural gap in life satisfaction can be explained by lower bonding social capital and lower access to nature amenities in the five largest cities. This confirms Tönnies' (1887 [1957]) theory that urbanism produces communities with weaker family and friendship bonds, as well as experimental studies that report substantial gains in mental well-being as a result of spending time in nature and natural environments, including green urban spaces (e.g., Van den Berg et al., 2003; Tyrväinen et al., 2014; Hedblom et al., 2019).

In the Danish sample, income did not hold a significant association with life satisfaction. This is probably due to the Danish universalistic welfare system, which contains a social security system involving the redistribution of money in a scale that no one has to worry about money, provided that one acts economically prudent. When money is 'not an issue', other things take over in terms of determining your personal well-being. This paper suggests that in Denmark such other things mainly lie in the realms of social connections, being integrated in the dominating values and norms system, and having access to nature amenities. On all these counts, the five largest cities display lower scores than the rest of Denmark, and this ultimately seems to explain a rather high share of the urban-rural gap in life satisfaction in Denmark.

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Data availability Data used in this study are available from the author upon reasonable request.

Declarations

Competing Interests No competing interests to declare. No conflicts of interest to declare.

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