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# The rural happiness paradox in developed countries

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## ABSTRACT

In this paper, a national Danish survey is used to explore the rural happiness paradox in developed countries. This paradox revolves around the observation that rural residents tend to report higher subjective well-being than urban residents in developed countries. Based on three different rural-urban classifications, the paper provides a solid confirmation of the rural happiness paradox in Denmark. The paper tests three hypotheses regarding the factors behind the rural happiness paradox and finds strong support for two of the hypotheses. Thus, higher bonding social capital in rural areas and higher access to nature amenities in rural areas were found to contribute to the rural happiness paradox in Denmark. As for the third hypothesis, the paper finds no significant evidence that rural-urban differences in spatial location satisfaction (measured by the correspondence between actual and preferred residential location on the rural-urban continuum) contribute to the rural happiness paradox in Denmark.

## 1. Introduction

Significant research has been done on the geographical variation of subjective well-being within countries. One finding is that rural residents in developed countries tend to report higher levels of subjective well-being than urban residents. This has been found in studies that examine the rural-urban evidence in counties around the world (Berry and Okulicz-Kozaryn, 2009; Requena, 2016; Easterlin et al., 2011), in the EU (Sørensen, 2014; Lenzi and Perucca, 2018), the US (Campbell et al., 1976; Berry and Okulicz-Kozaryn, 2011; Winters and Li, 2017), Australia (Kubiszewski et al., 2018), and Scotland (Dunlop et al., 2016; Gilbert et al., 2016).

In the same vein, other studies have found that the residents in capital cities in developed countries report lower levels of subjective well-being compared to the residents residing elsewhere. Piper (2015), for example, finds that the residents in the capital cities of 16 European countries are less happy than the residents outside the capital cities. Moreover, several studies of single countries report lower levels of subjective well-being in the capital city or largest cities, including the US (Okulicz-Kozaryn, 2017), Canada (Lu et al., 2015), New Zealand (Morrison, 2011), Ireland (Brereton et al., 2008), Sweden (Gerdtham and Johannesson, 2001), and Romania (Lenzi and Perucca, 2016). These studies rely on survey data that contain self-reports of individual happiness, life satisfaction, and/or quality of life.

The higher subjective well-being among rural residents in developed countries could be termed the *rural happiness paradox* for two reasons. First, rural-to-urban migration has been a megatrend ever since 1900 (UN, 2006, 2019). Second, rural residents in *developing* countries consistently report *lower* subjective well-being than urban residents (Easterlin et al., 2011; Requena, 2016). Only a few studies have examined the possible reasons behind the rural happiness paradox (Sørensen, 2014; Piper, 2015; Morrison and Weckroth, 2018; Okulicz-Kozaryn and Mazelis, 2018). These few studies have examined various socioeconomic, environmental, and psychological factors that might explain the rural happiness paradox, but none of the studies have managed to completely explain the rural

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happiness paradox by the proposed explanatory factors.

This paper examines the evidence from Denmark by drawing on a national survey conducted in 2011 and 2012. It seems appropriate to use the Danish case, because the Danish population is well distributed across rural and urban settlement types. Denmark has about 5.8 million inhabitants and is sparsely populated with about 135 inhabitants per square kilometer. Nevertheless, many people live in cities. The three largest cities are the following with their approximate population numbers per January 1, 2020 shown in brackets: the capital city of Copenhagen (consisting of four municipalities, 800,000 inhabitants), Aarhus (280,000 inhabitants), and Odense (180,000 inhabitants).<sup>1</sup> Importantly, the capital city of Copenhagen forms the core around a much wider urban area called Greater Copenhagen that consists of 18 municipalities with a total of about 1.3 million inhabitants.

The aim of the paper is two-fold. The first aim is to perform a robustness test of the rural happiness paradox by using three different rural-urban classifications based on the respondent's assessment regarding area type, town population size, and type of municipality. Previous studies have mainly used single and very different rural-urban classifications.<sup>2</sup> Therefore, using three different rural-urban classifications will provide a solid test of the validity of the rural happiness paradox at the outset of the paper.

The second aim of the paper is to examine three factors at the individual level that might explain the rural happiness paradox in developed countries. The first factor is individual *spatial location satisfaction* (Sørensen, 2010). Spatial location satisfaction is a measure of the correspondence between actual and preferred residential location on a 5-point rural-urban continuum (in the countryside, village, small town, medium-sized town, large city). The second and third factor is *social capital and access to nature amenities*. Thus, social capital and nature have often been put forward as the trump cards of rural areas in developed countries (Léon, 2005; OECD, 2006). For example, in the foreword of the rural policy document of the Organisation for Economic Co-operation and Development (OECD), *The New Rural Policy Paradigm: Policies and Governance* (2006, p. 3), rural areas are encouraged to focus on "their existing assets, such as location, natural and cultural amenities, and social capital". Spatial location satisfaction, social capital, and access to nature amenities are expected to be positively correlated with subjective well-being. At the same time, spatial location satisfaction, social capital, and access to nature amenities may be higher in rural areas and therefore these factors may contribute to understanding the origins of the rural happiness paradox.

The rest of the paper is organized as follows. The next section elaborates more on the existence of the rural happiness paradox, and the third section reviews previous research on the causes behind the rural happiness paradox. The fourth section puts forward three testable hypotheses in relation to spatial location satisfaction, social capital, and access to nature amenities. The fifth section describes the data and the methods used. The sixth section presents the results. The last section concludes.

## 2. The rural happiness paradox

As mentioned, the higher subjective well-being among rural residents in developed countries could be termed the *rural happiness paradox* for two reasons. First, cities are sometimes referred to as one of the world's best inventions holding promises of a richer, smarter, healthier, and happier life. This claim, mainly proposed by Glaeser (2011), seems rather bold, but fact remains that migration from rural to urban areas has been a megatrend in Western countries ever since population records have been kept (UN, 2006, 2019). Rural-urban migrants are undoubtedly *seeking* for a better life in what has been termed "escalator regions" for people who wish to step up the social ladder through education and job in the region (Fielding, 1992).

Second, city residents in *developing* countries consistently report higher subjective well-being than rural residents. (Requena (2016)), for example, examines whether the geographical dispersion of happiness within a country depends on the development stage of the country. The study is based on individual-level data from 29 European countries that took part in the European Social Survey in 2012, and the countries are divided into two groups consisting of 24 developed countries and 5 developing countries with a GDP per capita above and below US\$ 20,000. The results show that happiness is highest in the countryside and lowest in the big cities in the developed countries, whereas the exact opposite is the case for the developing countries.<sup>3</sup>

In the same vein, Easterlin et al. (2011) use data from the Gallup World Poll conducted from 2005 to 2008 to examine urban-rural differences in life satisfaction in a number of countries, including 48 less developed countries in Africa, Latin America, and Asia, 12 transition countries in central and eastern European countries, and 16 developed countries in Europe, the United States, Canada, Australia, and Japan. Easterlin et al. (2011) find a higher urban life satisfaction in the developing countries and the same or a higher rural life satisfaction in the developed countries. Rural life satisfaction exceeds urban life satisfaction in 14 countries, and the excess rural over urban life satisfaction is most pronounced in some of the most developed countries such as Great Britain, the Netherlands, and Norway. In the remaining countries, life satisfaction is higher in urban areas, and the excess urban over rural life satisfaction is quite pronounced in some of the least developing countries, like for example Uganda, Tanzania, and Cambodia. Overall, Easterlin et al. (2011, p. 2190) find that the country-level mean difference in urban and rural life satisfaction is significantly and negatively related to

<sup>1</sup> Population numbers were found in the online database of Statistics Denmark: [www.statbank.dk/BY1](http://www.statbank.dk/BY1) (accessed 28 October 2020). The capital city of Copenhagen consists of the following four municipalities: København, Frederiksberg, Dragør, and Tårnby.

<sup>2</sup> For example, Gerdtam and Johannesson (2001) use a cut-off point of 30,000 inhabitants to construct their binary rural-urban variable, which is a rather broad definition. Easterlin et al. (2011) use a survey item where respondents are asked to describe the place where they live: 1) a rural area or farm, 2) in a small town or village, 3) in a suburb of a large city, or 4) in a large city. Berry and Okulicz-Kozaryn (2011) use a survey item where respondents are asked to state the number of inhabitants in the place or town where they live, given a set of range options.

<sup>3</sup> This applies in absolute terms and when the results are adjusted for other factors that may be linked to happiness, such as marital status, employment, social capital, health, and religiosity (Requena, 2016).

log GDP per capita, which reflects a gradual shift from higher urban subjective well-being in developing countries to higher rural subjective well-being in developed countries.

Using global data from the World Values Survey for the period 1995–2004, the rural-urban gradient in subjective well-being across countries was first found by [Berry and Okulicz-Kozaryn \(2009\)](#). In their sample of high-income countries, [Berry and Okulicz-Kozaryn \(2009\)](#) found dissatisfaction with life to be highest in big cities with more than 500,000 inhabitants and lowest in rural settlements with less than 2000 inhabitants. In their sample of low-income countries, on the other hand, neither rural nor big-city residence was found to have a statistically significant association with life satisfaction. In the same vein, after finding subjective well-being in New Zealand cities to be lowest in New Zealand's largest city, Auckland, [Morrison \(2011, p. 1039\)](#) spoke of a "localization of the paradox of affluence". This phrase finds inspiration in the so-called Easterlin paradox, which, although challenged by [Veenhoven and Hagerty \(2006\)](#) and [Stevenson and Wolfers \(2008\)](#), revolves around the observation that was originally made by [Easterlin \(1973, 1974\)](#) that even though people with high incomes are more satisfied with their lives than people with low incomes, country-level life satisfaction does not increase significantly with per capita income, at least in developed countries ([Easterlin, 1973, 1974, 1995; Diener and Biswas-Diener, 2002; Blanchflower and Oswald, 2004](#)). Morrison's (2011) localization of the paradox of affluence thus suggests that the Easterlin paradox also applies in some shape to different urbanization levels *within* countries through the combination of high urban income levels achieved through agglomeration economics on the one side and low urban subjective well-being on the other side.

### 3. Previous research on the causes behind the rural happiness paradox

By using data from the European Social Survey 2012, [Morrison and Weckroth \(2018\)](#) investigate whether the lower levels of life satisfaction reported by residents in the capital city of Helsinki can be explained by capital residents holding more extrinsic values with a personal focus (self-enhancement) and non-capital residents holding more intrinsic values with a social focus (self-transcendence). However, when regressing life satisfaction against extrinsic values and intrinsic values and including control variables, [Morrison and Weckroth \(2018\)](#) only find weak evidence that differences in these human values might explain the lower subjective well-being in the capital city.

Wirth's (1938) theory on urbanism stipulates three attributes that separates the city from the countryside: population size, population density, and population heterogeneity. Given these attributes, [Wirth \(1938\)](#) posits that urbanism leads to social disorganization, alienation, anomie (lack of norms), loneliness, social withdrawal, and enhanced levels of crime. Using US surveys running yearly from 2005 to 2008, [Okulicz-Kozaryn and Mazelis \(2018\)](#) test Wirth's theory of urban life by investigating whether urban problems such as crime, poverty, and lack of social contact can explain the lower the subjective well-being among city residents compared to non-city residents. Using regression analyses and several ways of defining urban areas, [Okulicz-Kozaryn and Mazelis \(2018\)](#) conclude that urban unhappiness persists after controlling for these urban problems. [Piper \(2015\)](#) finds the same when investigating similar urban characteristics. In the pooled data, [Piper \(2015\)](#) finds that residents in the capital cities of 16 European countries are still less happy than the residents outside the capital cities after controlling for the frequency of meeting friends and having confidants, the fear of crime and burglary, and the usual socio-economic factors.

Finally, using data from the European Values Study 2008 for the 28 European Union member states, [Sørensen \(2014\)](#) finds life satisfaction to be higher in rural areas than in urban areas when controlling for social-economic factors such as gender, age, education, employment, and income. After finding this, [Sørensen \(2014\)](#) goes on to look for reasons behind the higher rural life satisfaction and considers rural-urban differences in levels of insecurity, frames of comparison (when assessing one's life satisfaction), and levels of social capital (social interaction). [Sørensen \(2014\)](#) finds that only social capital can explain some of the rural-urban difference in life satisfaction, but far from all.

With regards to other factors that can influence subjective well-being, previous research has mainly pointed to the following ones: age, health, civil status, education, employment, and income. Thus, age has been shown to have a 'U'-shaped relation with subjective well-being ([Oswald, 1997; Blanchflower and Oswald, 2004; Sørensen, 2014, Graham et al., 2017](#)), whereas having good health ([Gerdtham and Johannesson, 2001; Peiró, 2006](#)), being married or in a relationship ([Stutzer and Frey, 2006; Bjørnskov et al., 2008](#)), having an education ([Peiró, 2006; Dolan et al., 2008](#)), having a job ([Clark and Oswald, 1994; Winkelmann and Winkelmann, 1998](#)), and having a high income ([Easterlin, 1995; Blanchflower and Oswald, 2004; Peiró, 2006](#)) were found to be positively correlated with subjective well-being.

### 4. Testable hypotheses

In finding no full explanation of the higher life satisfaction in rural areas, [Sørensen \(2014\)](#) suggests future studies to incorporate two possible factors, namely the so-called spatial location satisfaction and access to nature amenities. Thus inspired, the aim of this paper is to examine these two factors – together with the social capital factor – as possible explanatory factor behind the rural happiness paradox. In the following, three hypotheses will be put forward in relation to these three factors.

#### 4.1. Spatial location satisfaction

Spatial location satisfaction is understood as the level of correspondence between actual and preferred residential location on the rural-urban continuum. Spatial location satisfaction was coined by [Sørensen \(2010\)](#) who measured it through two questions in a Danish survey where the respondents first were asked to describe the kind of place where they are presently living and after that to describe the kind of place they would prefer to live in if they could choose freely, that is, if job and family considerations etc. did not

play a role. Both questions had to be answered by selecting one out of five response options: (1) a large city, (2) a medium-sized city, (3) a small town, (4) a village, and (5) in the countryside. Choosing the same actual and preferred residential location implies a perfect residential location match or, phrased differently, a perfect spatial location satisfaction.

Sørensen (2010) showed that spatial location satisfaction was highest among rural residents in the sample. Spatial location satisfaction might be important in the context of the rural happiness paradox because, as urbanization takes place, some individuals may have been 'forced' to move to urban areas to get a job or an education, whereas they would have preferred to live in a less urbanized environment if they could have chosen their residential location freely, that is, without having to consider important aspects such as job and education. Low spatial location satisfaction reflects the expectation of a better life elsewhere on the rural-urban continuum. For individuals living in an unfavored residential location, this may have a negative psychological impact and a negative impact on subjective well-being. Spatial location satisfaction is therefore assumed to be positively related to subjective well-being. To some extent, this is backed by previous research that found self-reported place satisfaction to be positively related to self-reported life satisfaction (Okulicz-Kozaryn and Valente, 2019).<sup>4</sup> Assuming that spatial location satisfaction is highest in rural areas, this leads to the first hypothesis:

**H1:** The existence of rural-urban differences in spatial location satisfaction contributes to the rural happiness paradox in developed countries.

Also, mention can be made of a study of Chinese rural-urban migrants by Knight and Gunatilaka (2010) who find that rural-urban migrant households settled in urban China have an average happiness score lower than rural households. Among other things, Knight and Gunatilaka (2010) ascribe this to lofty expectations about the life in the city among the migrants prior to the move. However, one could also posit the above explanation that rural-urban migrants may have been forced to move to the city to financially survive, whereas they would have preferred to remain in their rural home areas if they could have chosen freely irrespective of their job situation.

#### 4.2. Social capital

According to the theories of classical sociologists like Tönnies ([1887] 1957), Wirth (1938) and Simmel ([1903] 1950), social interaction, social cohesion and solidarity are higher in rural communities than in urban communities. Tönnies, for example, described the rural-urban dichotomy by the opposite poles of *Gemeinschaft* in rural areas, characterized by high social cohesion and involvement, and *Gesellschaft* in urban areas, characterized by weaker family and friendship bonds, division of labor, and high heterogeneity of populations.

Social interaction and involvement among individuals are linked to the concept of social capital. In this regard, Putnam (2000) differentiates between bonding social capital, which relates to the networks between individuals that know each other relatively well, and bridging social capital, which relates to more loose connections between individuals. Putnam (2000, p. 22) defines bonding social capital as "inward looking [networks that] tend to reinforce exclusive identities and homogeneous groups" and bridging social capital as "outward looking [networks that] encompass people across different social cleavages".

Overall, social interaction and involvement at the community level corresponds well with the bonding type of social capital. A study by Sørensen (2016) could empirically confirm the theory of higher bonding social capital in rural areas. Sørensen (2016) also found a tendency of bridging social capital being slightly higher in urban areas, suggesting that rural residents, to use terms coined by Granovetter (1973), have more *strong ties* than urban residents and that urban residents have more *weak ties* than rural residents.

In general, there is ample evidence to suggest that social capital is strongly positively related to subjective well-being (e.g., Bjørnskov, 2003; Helliwell and Putnam, 2004; Helliwell, 2006; Leung et al., 2011; Requena, 2016). Also, social capital has been found to contribute to the rural happiness paradox in developed countries. As mentioned earlier, Sørensen (2014) found that social capital, as measured by the level of voluntary work in civic associations, could explain some of the rural happiness paradox found in an EU sample, but far from all. The social capital measure used by Sørensen (2014) potentially involved both bonding and bridging social capital, since civic associations can either be based in the local community or outside the local community, including large national associations. Based on the above-mentioned, this paper will therefore re-examine the link between social capital and the rural happiness paradox by focusing on the bonding type of social capital through the second hypothesis:

**H2:** Higher bonding social capital in rural areas contributes to the rural happiness paradox in developed countries.

#### 4.3. Access to nature

There is an extensive literature on the mental and health benefits from being present in nature, either passively present in a way that is incidental to other activity, e.g. walking to work through a green area, or actively present, e.g. doing gardening, camping or trekking in nature (Pretty, 2004, 2012).

One branch of the literature, which is based on experiments undertaken within the field of environmental psychology, suggests that being in contact with nature environments promotes restoration from stress and mental fatigue. (Van den Berg et al. (2003)), for example, randomly divided 114 students at Wageningen University into two groups and both groups were shown a scary movie. After

<sup>4</sup> It should be noted that 'place satisfaction' and 'spatial location satisfaction' are different concepts. Thus, Okulicz-Kozaryn and Valente (2019, p. 204) measure place satisfaction by the following questionnaire item taken from two Flash Eurobarometer Surveys: "On the whole, are you very satisfied, fairly satisfied, not very satisfied or not at all satisfied with ... ? - The place where you live."

the scary movie, one group was shown either of two videos simulating a walk through a forest area and the other group was shown either of two videos simulating a walk through the city of Utrecht. Among other things, the mood of the participants was measured through self-ratings of depression, anger, tension, happiness, and stress before and after the scary movie and again after the environmental videos. The results showed that the mood of the participants in both groups deteriorated after seeing the scary movie. Importantly, after watching the natural videos, mood levels improved and returned to their initial levels, i.e. as before seeing the scary movie, whereas watching the urban videos did not have the same effect in terms of mood restoration.

Similarly, (Hartig et al. (2003)) carried out an experiment among 112 students from the University of California. Among other things, a demanding test was given to the participants, upon which one group of participants took a walk through a nature environment and another group of participants took a walk through an urban environment in the medium-density city of Orange, California. Measurements of blood pressure and self-reports of mood and overall happiness were administered before and after the various interventions. Results showed that psychophysiological stress decreased by the end of the walk in the nature environment, whereas the opposite emerged after walking in the urban environment.

Another branch of literature has found a positive effect of urban green spaces on the well-being of urban residents. For example, in the city of Bogotá, Columbia, frequent use of the city's 96 urban parks was found to be a significant predictor of well-being (Scopelitti et al., 2016). In a survey of residents in 30 cities in China, Smyth et al. (2008) found access to urban parkland to be positively related to higher levels of well-being as measured by self-reported life satisfaction. In the Swedish cities of Stockholm and Göteborg, self-reported access to green areas was found to have a positive impact on well-being by reducing the annoyances from city noise (Gidlöf-Gunnarsson and Öhrström, 2007). In a study of three cities in Italy and the UK, frequent visits to urban green spaces was found to impact positively on well-being in periods of heat waves (Laforteza et al., 2009). For residents in Australia's capital cities, Ambrey and Fleming (2014) found the percentage of public green space in the resident's local area to be positively related to self-reported life satisfaction. Finally, in six UK cities, frequent visits to urban green spaces was found to improve the well-being of residents in highly urbanized locations. Interestingly, the highest level of well-being could be achieved if visits to urban green spaces were supplemented with visits to the countryside outside the cities (Coldwell and Evans, 2018).

Finally, mention should be made of a branch of literature that looks specifically at the effects of being physically active in nature. For example, in a meta-analysis of ten UK studies, Barton and Pretty (2010) found that physical exercise in nature (green exercise) has a positive impact on self-esteem and mood indicators of mental health. Similarly, in a health promotion initiative administered on a clinical population having a range of mental problems, Barton et al. (2012) found that participants gained mood and self-esteem improvements when participating in a six-week green exercise program that consisted of weekly countryside and urban park walks. Also, more recently, studies have found wilderness expeditions and wilderness therapy (involving hiking/backpacking) to significantly improve adolescent mental health and well-being (Barton et al., 2016; Tucker et al., 2016).

In sum, access to nature amenities may be the missing link when it comes to understanding the rural happiness paradox in developed countries. This paper will examine this by testing the third hypothesis:

**H3:** Higher access to nature amenities contributes to the rural happiness paradox in developed countries.

## 5. Data and methods

### 5.1. Data

This paper uses data from the Danish Rural-Urban Survey (DRUS), which I and a colleague administered in 2011 and 2012. The aim of the survey was to collect information about rural and urban dwellers in Denmark on a wide number of issues related to their living conditions, aspirations, values, and attitudes. The survey was carried out among residents in Denmark aged 18 and above. Respondents were randomly selected within four geographical areas based on the so-called Rural District Classification that divides all the 98 Danish municipalities into four categories depending on the degree to which they contain rural areas: peripheral municipalities (16 municipalities), rural municipalities (30 municipalities), intermediate municipalities (17 municipalities), and urban municipalities (35 municipalities).<sup>5</sup> From a research point of view, the purpose of the stratified sampling design was to secure a reasonable number of responses from rural dwellers. The practical collection was done by a professional institute via telephone-based interviews. The collection period ran from November 1, 2011 to January 26, 2012, and 2000 responses were collected: 496 from peripheral municipalities, 522 from rural municipalities, 491 from intermediate municipalities, and 491 from urban municipalities. Compared to the entire country, respondents from peripheral municipalities are overrepresented and respondents from urban municipalities are

<sup>5</sup> The Rural District Classification is based on 14 indicators outlined by Kristensen et al. (2006), and it was used by the two resort ministries in their biennial surveys on Danish rural districts in 2009 and 2011 (Danish Ministry of Welfare and Danish Ministry of Food, Agriculture and Fisheries, 2009; Danish Ministry of the Interior and Health and Danish Ministry of Food, Agriculture and Fisheries, 2011).

underrepresented in the sample. Therefore, sampling weights were used to obtain nationally representative parameter estimates.<sup>6</sup>

Subjective well-being has been measured by self-reports of happiness and life satisfaction in many surveys, e.g. the World Values Survey (WVS), the European Quality of Life Survey (EQLS), and the European Social Survey (ESS). In general, life satisfaction is viewed as the cognitive component of subjective well-being, since evaluating one's satisfaction requires a cognitive evaluation, whereas happiness is viewed as the emotional or affective component of subjective well-being (Diener et al., 2003; Helliwell and Putnam, 2004; Peiró, 2006). According to Helliwell and Putnam (2004, p. 1435), "self-ratings of happiness turn out to reflect relatively short-term situation-dependent expressions of mood, whereas self-ratings of life satisfactions appear to measure longer-term, more stable evaluations". Although both measures have been used extensively, some researchers tend to prefer the life satisfaction measure, exactly because it is viewed as a more stable measurement. The DRUS only holds the life satisfaction question, which therefore will be used in this paper. The exact question in the DRUS is the following: "All things considered, how satisfied are you with your life as a whole these days?" The same wording of the life satisfaction question is used in the WVS. In the DRUS, the possible answers range from 1 (dissatisfied) to 10 (satisfied).

As mentioned, this paper will use three different rural-urban classifications contained in the DRUS to identify rural-urban differences in subjective well-being. The *first* rural-urban classification is based on the question: "Which of the following describes best the place you live today?". The respondent could choose among five options: in the countryside, village, small town, medium-sized town, or large city. The *second* rural-urban classification is based on town population size, as captured by the following question in the DRUS: "Approximately, how many inhabitants live in the town/the place where you live today?". This item is a categorical variable with 10 categories: fewer than 200, 200–1,000, 1,001–2,000, 2,001–5,000, 5,001–10,000, 10,001–20,000, 20,001–50,000, 50,001–100,000, 100,001–500,000, and more than 500,000. For simplicity, following Sørensen (2014), the ten categories were collapsed into three area types: 1) rural areas, defined as towns or places with less than 5001 inhabitants, 2) town areas, defined as towns with 5001 to 100,000 inhabitants, 3) city areas, defined as cities with more than 100,000 inhabitants. Finally, the *third* rural-urban classification is the previously mentioned rural district classification that divides the 98 Danish municipalities into four different municipality types: peripheral municipalities, rural municipalities, intermediate municipalities, and urban municipalities.

The previous section put forward three hypotheses related to the concept of spatial location satisfaction, bonding social capital, and access to nature amenities. *Spatial location satisfaction* is measured by the distance between the respondent's actual and preferred residential environment based on the following two questions in the DRUS: 1) "Which of the following describes best the place you live today?" and 2) Where would you prefer to live if you could choose freely, that is, if job and family considerations etc. did not play a role?" Both questions had 5 options to choose from: (1) a large city, (2) a medium-sized city, (3) a small town, (4) a village, and (5) in the countryside. A perfect spatial location satisfaction would exist if the respondent selects the same category in both questions. Thus, in this paper, spatial location satisfaction will be measured by the dichotomous variable defined by whether the respondent lives in his/her preferred residential environment or not. *Bonding social capital* is measured by whether the respondent totally agrees or not in the following claim stated in the DRUS: "You feel that you have a strong solidarity with the other people who live in your local community". This question had five options to choose from: totally agree, agree in part, neither disagree or agree, disagree in part, totally disagree. Finally, *access to nature amenities* is measured by the following question in the DRUS: "Are there many nature amenities within and around your local community?" The question had to be answered on a scale from 1 (none at all) to 10 (very many).

## 5.2. Methods

The basic method in this paper is to estimate the subjective well-being function:

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

where  $W_i$  is the reported well-being of individual  $i$ , and  $X_i$  is the vector of explanatory variables. The error term  $\varepsilon$  holds unobserved traits. A standard ordinary least squares (OLS) estimation is used to estimate Eqn. (1). OLS assumes cardinality of the outcome variable and although the life satisfaction variable is an ordinal variable, OLS is an appropriate estimation method in this case. OLS estimates are easier to interpret compared to those in ordered logit/probit models, and Ferrer-i-Carbonell and Frijters (2004) have shown that OLS results are substantially the same as those from discrete models. For these reasons, OLS has become the default method in happiness research (Blanchflower and Oswald, 2011).<sup>7</sup> In all regressions, sampling weights are used, and the regressions are run with robust standard errors.

The main explanatory variables are the three rural-urban classifications and the variables measuring spatial location satisfaction, bonding social capital, and access to nature amenities. In addition, the analyses will include several socio-economic control variables which have been found to be robustly associated with subjective well-being by previous research (e.g., Clark and Oswald, 1994;

<sup>6</sup> In September 2011, the professional institute acquired four representative extracts from Statistics Denmark that covered the four municipality categories separately. The sample is thus not representative of the entire country, but representative within each municipality category as defined by the Rural District Classification. By comparing the number of respondents in the sample with the total number of people (aged 18 and above) in each municipality category at the time of data extraction, the institute calculated the following sampling weights shown in parentheses: peripheral municipalities (0.36), rural municipalities (1.06), intermediate municipalities (0.63), and urban municipalities (1.95). Statistics Denmark had access to the Danish Central Civil Register, which contains information about all people legally residing in Denmark, and Statistics Denmark drew the representative extracts from this register.

<sup>7</sup> As a check, ordered logit regressions were also performed, and the results were similar.

**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.
In the countryside	1 = Lives in the countryside; 0 = otherwise
Village	1 = Lives in a village; 0 = otherwise
Smaller town	1 = Lives in a smaller town; 0 = otherwise
Medium-sized town	1 = Lives in a medium-sized town; 0 = otherwise
City	1 = Lives in a city; 0 = otherwise
Rural area	1 = Lives in a town/place with less than 5001 inhabitants; 0 = otherwise
Town area	1 = Lives in a town/place with 5001–100,000 inhabitants; 0 = otherwise
City area	1 = Lives in a town/place with more than 100,000 inhabitants; 0 = otherwise
Peripheral municipality	1 = Lives in a peripheral municipality; 0 = otherwise
Rural municipality	1 = Lives in a rural municipality; 0 = otherwise
Intermediate municipality	1 = Lives in an intermediate municipality; 0 = otherwise
Urban municipality	1 = Lives in an urban municipality; 0 = otherwise
Male	1 = Male; 0 = otherwise
Female	1 = Female; 0 = otherwise
Age	Age as continuous variable
Age 18-29	1 = 18–29 years old, 0 = otherwise
Age 30-39	1 = 28–39 years old, 0 = otherwise
Age 40-49	1 = 40–49 years old, 0 = otherwise
Age 50-59	1 = 50–59 years old, 0 = otherwise
Age 60-69	1 = 60–69 years old, 0 = otherwise
Age 70+	1 = 70 years old or older, 0 = otherwise
Poor or very poor health	1 = Poor or very poor health; 0 = otherwise
Fair health	1 = Fair 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
Outside work force	1 = Temporarily or permanently outside work force; 0 = otherwise
<220,000	1 = Yearly gross household income per head of household: < DKK220,000; 0 = otherwise
220,000–359,999	1 = Yearly gross household income per head of household: DKK200,000–359,999; 0 = otherwise
360,000 or more	1 = Yearly gross household income per head of household: DKK360,000 or more; 0 = otherwise
Perfect spatial location satisfaction	Equals 1 if the respondent has selected the same category when responding to the two questions: a) “Which of the following descriptions describes best the place where you live today?” and b) “Where would you like to live, if you could choose freely, i.e. if job and family etc. did not play a role?”. The respondent could select among the same five answer categories in both questions (in the countryside, in a village, in a smaller town, in a medium-sized town, in a city). 0 if 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.

Blanchflower and Oswald, 2004; Bjørnsoev et al., 2008; Dolan et al., 2008; Easterlin, 1995; Gerdttham and Johannesson, 2001; Oswald, 1997; Peiró, 2006; Stutzer and Frey, 2006; Winkelmann and Winkelmann, 1998). Consequently, the following control variables from the DRUS will be included: gender, age (6-scale variable from “18–29 year old” to “70 years old or older”), self-reported health (4-point scale variable: “poor or very poor health”, “fair health”, “good health”, “very good health”), partner status (whether living together with a partner or not), children (4-point scale variable from “no children” to “3 or more children”), education (6-point scale variable: primary education, secondary education, vocational education, short higher education, medium higher education, long higher education), employment status (4-point scale variable: wage earner, self-employed, unemployed, outside workforce), and yearly gross household income per head of household (3-point scale variable: “less than DKK 220,000”, “DKK 220,000 to DKK 359,999”, “DKK 360,000 or more”).

The regressions will be performed for a working sample of respondents who have provided an answer to all the questions behind the dependent and independent variables. In this way, all regressions will be based on the same sample size:  $n = 1357$ . In the regressions,

**Table 2**  
Descriptive statistics.

	Full sample				Working sample (n = 1357)		
	n	Mean	SD	Min/Max	Mean	SD	Min/Max
Life satisfaction	1993	8.61	1.58	1/10	8.66	1.51	1/10
In the countryside	2000	0.12	0.33	0/1	0.13	0.33	0/1
Village	2000	0.22	0.41	0/1	0.22	0.41	0/1
Smaller town	2000	0.28	0.45	0/1	0.29	0.45	0/1
Medium-sized town	2000	0.24	0.43	0/1	0.23	0.42	0/1
City	2000	0.14	0.35	0/1	0.13	0.34	0/1
Rural area	1908	0.44	0.50	0/1	0.44	0.50	0/1
Town area	1908	0.44	0.50	0/1	0.44	0.50	0/1
City area	1908	0.12	0.33	0/1	0.12	0.32	0/1
Peripheral municipality	2000	0.25	0.43	0/1	0.26	0.44	0/1
Rural municipality	2000	0.26	0.44	0/1	0.26	0.44	0/1
Intermediate municipality	2000	0.25	0.43	0/1	0.24	0.43	0/1
Urban municipality	2000	0.25	0.43	0/1	0.24	0.43	0/1
Male	2000	0.47	0.50	0/1	0.50	0.50	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
Age 18–29	2000	0.10	0.30	0/1	0.07	0.25	0/1
Age 30–39	2000	0.13	0.33	0/1	0.14	0.34	0/1
Age 40–49	2000	0.19	0.39	0/1	0.21	0.41	0/1
Age 50–59	2000	0.22	0.41	0/1	0.24	0.43	0/1
Age 60–69	2000	0.21	0.41	0/1	0.22	0.41	0/1
Age 70+	2000	0.16	0.36	0/1	0.13	0.34	0/1
Poor or very poor health	1997	0.05	0.21	0/1	0.04	0.18	0/1
Fair health	1997	0.19	0.39	0/1	0.18	0.38	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	0.40	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	1977	0.53	0.50	0/1	0.57	0.50	0/1
Self-employed	1977	0.06	0.25	0/1	0.06	0.24	0/1
Unemployed	1977	0.03	0.17	0/1	0.03	0.16	0/1
Outside work force	1977	0.38	0.49	0/1	0.34	0.47	0/1
<220,000	1483	0.33	0.47	0/1	0.31	0.46	0/1
220,000–359,999	1483	0.39	0.49	0/1	0.40	0.49	0/1
360,000 or more	1483	0.28	0.45	0/1	0.29	0.46	0/1
Perfect spatial location satisfaction	1983	0.66	0.47	0/1	0.67	0.47	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

the rural-urban classifications will first be entered separately. After that, the socio-economic control variables will be added. Finally, spatial location satisfaction, bonding social capital and access to nature amenities will be added successively. Based on theory and previous literature, the paper hypothesizes rural location, spatial location satisfaction, bonding social capital, and nature amenities to be positively related to life satisfaction. As these hypotheses are directional, one-tailed tests are appropriate. However, results for two-tailed as well as one-tailed tests are provided. Table 1 shows the variable list.

Table 2 shows the descriptive statistics for the full sample and for the working sample. As can be seen in Table 2, the working sample is very similar to the full sample in terms of primary characteristics (life satisfaction, the three rural-urban classifications, spatial location satisfaction, bonding social capital, and nature amenities) and secondary characteristics (socio-economic control variables).

## 6. Results

### 6.1. Robustness test of the rural happiness paradox in Denmark

Table 3 shows the mean life satisfaction across three rural-urban classifications. Results are shown for both the full and the working

**Table 3**  
Life satisfaction across three rural-urban classifications.

	Full sample Mean (standard error)	Working sample Mean (standard error)
In the countryside (reference)	8.76 (0.11)	8.75 (0.13)
Village	8.70 (0.08)	8.71 (0.10)
Smaller town	8.45 (0.08) **	8.54 (0.08)
Medium-sized town	8.62 (0.07)	8.74 (0.09)
City	8.46 (0.07) **	8.45 (0.08) **
<i>n</i>	1993	1357
Rural area (reference)	8.69 (0.06)	8.66 (0.07)
Town area	8.58 (0.06)	8.66 (0.07)
City area	8.43 (0.07) ***	8.45 (0.07) **
<i>n</i>	1901	1357
Peripheral municipality (reference)	8.70 (0.12)	8.76 (0.14)
Rural municipality	8.68 (0.07)	8.76 (0.08)
Intermediate municipality	8.60 (0.09)	8.57 (0.10)
Urban municipality	8.47 (0.05) *	8.52 (0.06) *
<i>n</i>	1993	1357

Notes: Mean life satisfaction on a 10-point scale, where 1 is dissatisfied and 10 is satisfied. Two-sample *t*-tests for equality of means were performed using sampling weights and using the least densely populated area type as reference.

\*\*\**p* < 0.01 (two-tailed); \*\**p* < 0.05 (two-tailed); \**p* < 0.05 (one-tailed).

sample. Even though the three classifications are quite different, they all provide evidence of the rural happiness paradox in Denmark. Thus, in the first rural-urban classification, city residents report lower life satisfaction than residents in the countryside. In the second rural-urban classification, residents in city areas report lower life satisfaction than residents in rural areas. In the third rural-urban classification, residents in urban municipalities report lower life satisfaction than residents in peripheral municipalities. The differences in life satisfaction are statistically significant for the mentioned bottom and top categories within each rural-urban classification. In the two first rural-urban classifications, the rural-urban differences are more statistically significant in the full sample than in the working sample. As for the third rural-urban classification, the rural-urban differences in the full and the working sample are statistically significant at the same significance level. The rural happiness paradox in Denmark can also be seen in the regression results in Tables 4–6, that is, in Model 1 where the rural-urban classification is entered as the only predictor of life satisfaction. Thus, to sum up, the rural happiness paradox seems to be rather robust in Denmark.

## 6.2. Tracing the rural happiness paradox

After having provided a robust confirmation of the rural happiness paradox in Denmark, the question is now: What can explain the rural happiness paradox in Denmark? In other words, why do rural residents have higher life satisfaction than urban residents? To answer this question, five regressions were carried out for each of the three rural-urban classifications included as explanatory variable, see Tables 4–6. The five regressions in Tables 4–6 continuously add explanatory variables to the life satisfaction regression model. As mentioned, Model 1 only includes the rural-urban classification as explanatory variable. Model 2 adds general socioeconomic variables (gender, age, health, partner status, children, employment status, income). Model 3 adds spatial location satisfaction, Model 4 adds bonding social capital, and Model 5 adds access to nature amenities. The aim is to observe whether the rural happiness paradox disappears in the course of adding explanatory variables.

The rural happiness paradox does not disappear after adding the socioeconomic variables, see Tables 4–6, Model 2. In fact, the paradox gets a more pronounced for the first rural-urban classification, see Table 4. The results for the socio-economic variables confirm the results of previous studies that the following is positively related to subjective well-being: having a good health, having a partner, having a job, and having a high income (Clark and Oswald, 1994; Easterlin, 1995; Winkelmann and Winkelmann, 1998; Gerdtham and Johannesson, 2001; Stutzer and Frey, 2006; Peiró, 2006; Bjørnskov et al., 2008). The results weakly confirm the ‘U’-shaped relationship between age and subjective well-being that is normally found in the literature (see e.g. Blanchflower and Oswald, 2004; Graham et al., 2017; Oswald, 1997; Sørensen, 2014).<sup>8</sup> Finally, the results regarding education conflict with the general result in the literature that education is positively related to subjective well-being (Peiró, 2006; Dolan et al., 2008).

In Model 3 in Tables 4–6, the *first hypothesis* of this paper is investigated, that is, the hypothesis that rural-urban differences in spatial location satisfaction contribute to the rural happiness paradox in developed countries. In Model 3, the measure for spatial location satisfaction (living in the preferred residential environment or not) is added to the regressions. As expected, the spatial location satisfaction variable itself is positively related to life satisfaction – at the 5% significance level (two-tailed). However, even

<sup>8</sup> When entering a non-squared and a squared age variable, the non-squared variable gets a negative coefficient and the squared age variable gets a positive coefficient. However, the non-squared age variable is not statistically significant in any of the models, and the squared age variable is statistically significant in some of the models. The 6-scale age variable was preferred to the non-squared and squared age variable, because the 6-scale age variable resulted in models with higher adjusted  $R^2$  values. Also, the 6-scale age variable reveals that higher life satisfaction is only found in the top age category (70 years old or older) in most models.

**Table 4**  
Determinants of life satisfaction. Linear regressions with first rural-urban classification.

	Model 1	Model 2	Model 3	Model 4	Model 5
<b>Living area</b>					
In the countryside (reference)					
Village	-0.037 (-0.23)	-0.161 (-1.07)	-0.113 (-0.75)	-0.130 (-0.86)	-0.107 (-0.71)
Smaller town	-0.211 (-1.32)	-0.279 (-1.85) *	-0.249 (-1.66) *	-0.231 (-1.55)	-0.221 (-1.49)
Medium-sized town	-0.009 (-0.05)	-0.103 (-0.66)	-0.104 (-0.67)	-0.078 (-0.50)	-0.056 (-0.37)
City	-0.299 (-1.77) *	-0.380 (-2.30) **	-0.376 (-2.28) **	-0.303 (-1.82) *	-0.205 (-1.27)
<b>Gender and age</b>					
Female		0.087 (0.96)	0.092 (1.01)	0.111 (1.22)	0.072 (0.80)
Age 18-29 (reference)					
Age 30-39		-0.026 (-0.12)	-0.062 (-0.30)	-0.084 (-0.40)	-0.151 (-0.72)
Age 40-49		-0.179 (-0.84)	-0.201 (-0.95)	-0.220 (-1.04)	-0.317 (-1.47)
Age 50-59		0.192 (0.92)	0.166 (0.79)	0.110 (0.52)	-0.011 (-0.05)
Age 60-69		0.164 (0.75)	0.137 (0.63)	0.090 (0.41)	-0.015 (-0.07)
Age 70+		0.630 (2.65) ***	0.570 (2.42) **	0.503 (2.11) **	0.383 (1.60)
<b>Health</b>					
Poor or very poor (reference)					
Fair		0.658 (1.33)	0.661 (1.35)	0.686 (1.39)	0.681 (1.44)
Good		1.052 (2.21) **	1.048 (2.22) **	1.066 (2.24) **	1.065 (2.34) **
Very good		1.609 (3.35) ***	1.596 (3.37) ***	1.606 (3.36) ***	1.579 (3.47) ***
<b>Family and children</b>					
Has a partner		0.266 (2.34) **	0.248 (2.19) **	0.242 (2.14) **	0.205 (1.83) *
No children (reference)					
1 child		-0.065 (-0.40)	-0.069 (-0.44)	-0.083 (-0.52)	-0.080 (-0.51)
2 children		-0.171 (-1.13)	-0.165 (-1.09)	-0.199 (-1.31)	-0.199 (-1.32)
3 or more children		0.017 (0.09)	0.044 (0.24)	0.037 (0.20)	0.008 (0.04)
<b>Education</b>					
Primary school (reference)					
Secondary school		-0.196 (-0.61)	-0.177 (-0.56)	-0.208 (-0.65)	-0.233 (-0.73)
Vocational education		-0.153 (-0.80)	-0.146 (-0.76)	-0.136 (-0.71)	-0.186 (-1.01)
Higher education, short		-0.213 (-0.97)	-0.215 (-0.98)	-0.210 (-0.96)	-0.231 (-1.08)
Higher education, medium		-0.295 (-1.51)	-0.283 (-1.44)	-0.258 (-1.32)	-0.304 (-1.63)
Higher education, long		-0.083 (-0.40)	-0.071 (-0.34)	-0.040 (-0.19)	-0.092 (-0.46)
<b>Employment status</b>					
Wage earner (reference)					
Self-employed		0.212 (1.73) *	0.192 (1.57)	0.209 (1.74) *	0.191 (1.57)
Unemployed		-1.314 (-2.27) **	-1.262 (-2.19) **	-1.239 (-2.16) **	-1.261 (-2.22) **
Outside work force		0.197 (1.27)	0.212 (1.38)	0.218 (1.42)	0.170 (1.11)
<b>Household income (DKK)</b>					
< 220,000 (reference)					
220,000-359,999		0.184 (1.30)	0.185 (1.32)	0.195 (1.38)	0.180 (1.27)
360,000 or more		0.298 (2.09) **	0.305 (2.15) **	0.314 (2.21) **	0.277 (1.95) *
<b>Spatial location satisfaction (SLS)</b>					
Perfect SLS			0.226 (2.18) **	0.200 (1.92) *	0.181 (1.78) *
<b>Solidarity within local community</b>					
Strong solidarity (totally agree)				0.311 (3.34) ***	0.292 (3.13) ***
<b>Nature in local community</b>					
Nature amenities					0.084 (3.01) ***
<b>Model</b>					
Observations	1357	1357	1357	1357	1357
Adjusted R <sup>2</sup>	0.004	0.132	0.136	0.144	0.156

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* < 0.05 (one-tailed).

though the negative coefficients for the urban categories are slightly reduced in two cases, the inclusion of the spatial location satisfaction variable does not change the results for the three rural-urban classifications significantly.

To conclude, no evidence was found in favor of the first hypothesis. The first hypothesis rested on the assumption that spatial location satisfaction is highest in rural areas, as was the case in Sørensen (2010). As can be seen in Table 7, this assumption turned out not to be entirely right. In the first rural-urban classification, for example, residents in the countryside did have the highest spatial location satisfaction, but village residents had the lowest spatial location satisfaction. Moreover, in the second rural-urban classification, residents in town and city areas had a higher spatial location satisfaction than residents in rural areas.

The paper finds strong evidence in favor of the *second hypothesis* of this paper, that is, the hypothesis that higher bonding social capital in rural areas contributes to the rural happiness paradox in developed countries. Firstly, in accordance with previous research (Sørensen, 2016), Table 7 shows that bonding social capital indeed is significantly higher in rural areas. This is the case in all three rural-urban classifications. Thus, the highest level of bonding social capital is found in the least (or second-least) densely populated area types (village, rural area, and peripheral municipality), and the lowest level of bonding social capital is found in the most densely populated area types (city, city area, and urban municipality). Secondly, when adding the bonding social capital variable to the

**Table 5**  
Determinants of life satisfaction. Linear regressions with second rural-urban classification.

	Model 1	Model 2	Model 3	Model 4	Model 5
Living area					
Rural area (reference)					
Town area	-0.004 (-0.04)	0.004 (0.04)	-0.005 (-0.05)	0.028 (0.28)	0.030 (0.30)
City area	-0.210 (-1.74) *	-0.230 (-1.87) *	-0.259 (-2.09) **	-0.172 (-1.35)	-0.099 (-0.77)
Gender and age					
Female		0.091 (1.00)	0.095 (1.05)	0.113 (1.24)	0.072 (0.80)
Age 18-29 (reference)					
Age 30-39		-0.030 (-0.15)	-0.069 (-0.34)	-0.089 (-0.43)	-0.153 (-0.72)
Age 40-49		-0.174 (-0.81)	-0.203 (-0.96)	-0.217 (-1.03)	-0.309 (-1.43)
Age 50-59		0.193 (0.92)	0.162 (0.77)	0.109 (0.51)	-0.007 (-0.03)
Age 60-69		0.140 (0.64)	0.110 (0.51)	0.067 (0.31)	-0.032 (-0.14)
Age 70+		0.605 (2.53) **	0.539 (2.28) **	0.477 (2.00) **	0.362 (1.51)
Health					
Poor or very poor (reference)					
Fair		0.668 (1.35)	0.674 (1.37)	0.695 (1.41)	0.690 (1.46)
Good		1.073 (2.25) **	1.073 (2.27) **	1.085 (2.28) **	1.084 (2.38) **
Very good		1.636 (3.41) ***	1.623 (3.42) ***	1.626 (3.41) ***	1.599 (3.52) ***
Family and children					
Has a partner		0.264 (2.36) **	0.246 (2.20) **	0.241 (2.16) **	0.202 (1.82) *
No children (reference)					
1 child		-0.049 (-0.30)	-0.055 (-0.35)	-0.069 (-0.44)	-0.068 (-0.44)
2 children		-0.174 (-1.14)	-0.166 (-1.09)	-0.202 (-1.32)	-0.203 (-1.33)
3 or more children		0.013 (0.07)	0.045 (0.24)	0.037 (0.20)	0.009 (0.05)
Education					
Primary school (reference)					
Secondary school		-0.160 (-0.50)	-0.145 (-0.45)	-0.175 (-0.54)	-0.201 (-0.62)
Vocational education		-0.137 (-0.72)	-0.132 (-0.69)	-0.122 (-0.64)	-0.174 (-0.94)
Higher education, short		-0.207 (-0.92)	-0.211 (-0.94)	-0.205 (-0.92)	-0.224 (-1.03)
Higher education, medium		-0.276 (-1.42)	-0.265 (-1.36)	-0.241 (-1.25)	-0.290 (-1.56)
Higher education, long		-0.077 (-0.37)	-0.066 (-0.31)	-0.034 (-0.16)	-0.083 (-0.41)
Employment status					
Wage earner (reference)					
Self-employed		0.228 (1.85) *	0.207 (1.68) *	0.225 (1.85) *	0.204 (1.66) *
Unemployed		-1.349 (-2.33) **	-1.294 (-2.24) **	-1.265 (-2.22) **	-1.285 (-2.28) **
Outside work force		0.194 (1.26)	0.210 (1.38)	0.217 (1.42)	0.172 (1.13)
Household income (DKK)					
< 220,000 (reference)					
220,000-359,999		0.153 (1.07)	0.157 (1.10)	0.170 (1.19)	0.158 (1.10)
360,000 or more		0.272 (1.87) *	0.281 (1.94) *	0.292 (2.01) **	0.256 (1.78) *
Spatial location satisfaction (SLS)					
Perfect SLS			0.242 (2.39) **	0.217 (2.14) **	0.198 (2.00) **
Solidarity within local community					
Strong solidarity (totally agree)				0.314 (3.36) ***	0.294 (3.15) ***
Nature in local community					
Nature amenities					0.084 (2.94) ***
Model					
Observations	1357	1357	1357	1357	1357
Adjusted R <sup>2</sup>	0.002	0.130	0.135	0.144	0.155

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* < 0.05 (one-tailed).

regressions in Tables 4-6, the display of the rural happiness paradox either gets weaker or disappears entirely. In Table 4, the negative coefficient for city goes from being statistically significant at the 5% significance level (two-tailed) in Model 3 to being statistically significant at the 5% significance level (one-tailed) in Model 4. In Table 5, the negative coefficient for city area goes from being statistically significant at the 5% significance level (two-tailed) in Model 3 to being statistically insignificant in Model 4. In Table 6, the negative coefficient for urban municipality goes from being statistically significant at the 5% significance level (two-tailed) in Model 3 to being statistically significant at the 5% significance level (one-tailed) in Model 4.

Finally, the paper also finds strong evidence in favor of the *third hypothesis* of this paper, that is, the hypothesis that higher access to nature amenities contributes to the rural happiness paradox in developed countries. Firstly, Table 7 shows that access to nature amenities is lowest in the most densely populated area types (city, city area, and urban municipality). Secondly, when adding access to nature amenities to the regressions in Tables 4-6, the remaining displays of the rural happiness paradox disappear entirely. Thus, in Table 4, the negative coefficient for city goes from being statistically significant at the 5% significance level (one-tailed) in Model 4 to being statistically insignificant in Model 5. In Table 5, the rural-urban classification remains insignificant after including access to nature amenities. Finally, in Table 6, the negative coefficient for urban municipality goes from being statistically significant at the 5% significance level (one-tailed) in Model 4 to being statistically insignificant in Model 5.

**Table 6**  
Determinants of life satisfaction. Linear regressions with third rural-urban classification.

	Model 1	Model 2	Model 3	Model 4	Model 5
<b>Living area</b>					
Peripheral municipality (reference)					
Rural municipality	−0.006 (−0.05)	0.049 (0.44)	0.054 (0.48)	0.072 (0.66)	0.109 (0.98)
Intermediate municipality	−0.193 (−1.65) *	−0.163 (−1.43)	−0.152 (−1.33)	−0.104 (−0.91)	−0.079 (−0.70)
Urban municipality	−0.246 (−2.09) **	−0.260 (−2.11) **	−0.251 (−2.05) **	−0.203 (−1.65) *	−0.128 (−1.05)
<b>Gender and age</b>					
Female		0.091 (1.00)	0.094 (1.04)	0.113 (1.24)	0.073 (0.81)
<b>Age 18–29 (reference)</b>					
Age 30–39		−0.047 (−0.22)	−0.082 (−0.39)	−0.101 (−0.48)	−0.161 (−0.76)
Age 40–49		−0.193 (−0.89)	−0.218 (−1.02)	−0.234 (−1.10)	−0.322 (−1.49)
Age 50–59		0.188 (0.90)	0.162 (0.77)	0.106 (0.50)	−0.008 (−0.04)
Age 60–69		0.173 (0.80)	0.150 (0.70)	0.097 (0.44)	−0.009 (−0.04)
Age 70+		0.625 (2.64) ***	0.569 (2.43) **	0.497 (2.10) **	0.379 (1.59)
<b>Health</b>					
Poor or very poor (reference)					
Fair		0.655 (1.32)	0.656 (1.33)	0.686 (1.39)	0.690 (1.45)
Good		1.051 (2.18) **	1.047 (2.19) **	1.068 (2.23) **	1.079 (2.35) **
Very good		1.626 (3.36) ***	1.609 (3.36) ***	1.623 (3.38) ***	1.607 (3.51) ***
<b>Family and children</b>					
Has a partner		0.259 (2.31) **	0.247 (2.20) **	0.233 (2.08) **	0.191 (1.73) *
<b>No children (reference)</b>					
1 child		−0.014 (−0.09)	−0.018 (−0.11)	−0.041 (−0.26)	−0.045 (−0.29)
2 children		−0.137 (−0.91)	−0.127 (−0.84)	−0.173 (−1.14)	−0.181 (−1.20)
3 or more children		0.047 (0.26)	0.079 (0.42)	0.061 (0.33)	0.031 (0.16)
<b>Education</b>					
<b>Primary school (reference)</b>					
Secondary school		−0.123 (−0.39)	−0.117 (−0.37)	−0.141 (−0.44)	−0.165 (−0.51)
Vocational education		−0.106 (−0.54)	−0.103 (−0.53)	−0.095 (−0.49)	−0.147 (−0.78)
Higher education, short		−0.177 (−0.78)	−0.183 (−0.81)	−0.177 (−0.79)	−0.200 (−0.92)
Higher education, medium		−0.261 (−1.32)	−0.256 (−1.29)	−0.225 (−1.14)	−0.268 (−1.42)
Higher education, long		−0.043 (−0.20)	−0.043 (−0.20)	0.003 (0.02)	−0.041 (−0.20)
<b>Employment status</b>					
<b>Wage earner (reference)</b>					
Self-employed		0.254 (2.04) **	0.236 (1.89) *	0.242 (1.98) **	0.215 (1.75) *
Unemployed		−1.321 (−2.32) **	−1.268 (−2.23) **	−1.247 (−2.21) **	−1.276 (−2.28) **
Outside work force		0.192 (1.25)	0.207 (1.36)	0.212 (1.40)	0.166 (1.10)
<b>Household income (DKK)</b>					
<b>&lt; 220,000 (reference)</b>					
220,000–359,999		0.174 (1.23)	0.181 (1.28)	0.183 (1.29)	0.160 (1.13)
360,000 or more		0.298 (2.04) **	0.308 (2.12) **	0.311 (2.14) **	0.264 (1.83) *
<b>Spatial location satisfaction (SLS)</b>					
<b>Perfect SLS</b>					
Solidarity within local community			0.220 (2.19) **	0.201 (2.01) **	0.187 (1.90) *
Strong solidarity (totally agree)				0.314 (3.42) ***	0.288 (3.13) ***
<b>Nature in local community</b>					
Nature amenities					0.083 (2.99) ***
<b>Model</b>					
Observations	1357	1357	1357	1357	1357
Adjusted R <sup>2</sup>	0.003	0.134	0.138	0.147	0.158

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* < 0.05 (one-tailed).

As nature amenities can be expected to be negatively correlated with urbanity, one could argue that it is hardly surprising that the coefficients for the most urban locations turn insignificant when we control for nature amenities. This argument, however, rests on the assumption that access to nature amenities only varies across the rural-urban continuum and that there is no relationship between nature amenities and subjective well-being within each specific area type. Table 8 reports the results of a test of the latter assumption. It shows the results for the main factors (spatial location satisfaction, social capital, and nature amenities) when regressions are run separately for residents in each area type in the three rural-urban classifications. Table 8 shows many cases of positive and statistically significant relationships between nature amenities and life satisfaction within both rural and urban area types. Therefore, access to nature amenities cannot be regarded just as a mere reflection on the location type. The results thus suggest that access to nature amenities has a strong predicting power on subjective well-being also within specific area types of the rural-urban classifications.

Overall, the results suggest that the rural happiness paradox for the main part can be explained by rural-urban differences in bonding social capital and access to nature amenities. In other words, the rural-urban differences in subjective well-being seem to be mainly driven by these two factors. After controlling for the two factors, along with other individual controls, the rural-urban difference in life satisfaction is no longer statistically significant. This is further corroborated by the fact that in all three cases, Model 5

**Table 7**  
Spatial location satisfaction, social capital and nature amenities across rural-urban classifications.

	Perfect spatial location satisfaction, mean	Strong solidarity, mean	Nature amenities, mean
In the countryside (reference)	0.75 (0.04)	0.45 (0.04)	8.42 (0.16)
Village	0.54 (0.03) ***	0.50 (0.03)	8.14 (0.13)
Smaller town	0.61 (0.03) ***	0.38 (0.03)	8.30 (0.10)
Medium-sized town	0.74 (0.02)	0.36 (0.03) *	8.11 (0.11)
City	0.69 (0.03)	0.17 (0.02) ***	7.03 (0.14) ***
Number of observations	1357	1357	1357
Rural area (reference)	0.64 (0.02)	0.47 (0.02)	8.23 (0.09)
Town area	0.66 (0.02)	0.36 (0.02) ***	8.14 (0.08)
City area	0.70 (0.03) *	0.16 (0.02) ***	7.06 (0.14) ***
Number of observations	1357	1357	1357
Peripheral municipality (reference)	0.70 (0.04)	0.50 (0.04)	8.65 (0.16)
Rural municipality	0.68 (0.02)	0.42 (0.03)	8.17 (0.10) **
Intermediate municipality	0.64 (0.03)	0.33 (0.03) ***	8.28 (0.13) *
Urban municipality	0.64 (0.02)	0.29 (0.02) ***	7.56 (0.09) ***
Number of observations	1357	1357	1357

Notes: Perfect spatial location satisfaction and strong solidarity are dichotomous variables with codes 1 and 0. Nature amenities is measured on a 10-point scale. Standard errors in parentheses. Two-sample *t*-tests for equality of means were performed using sampling weights and using the least densely populated area type as reference.

\*\*\* $p < 0.01$  (two-tailed), \*\* $p < 0.05$  (two-tailed), \* $p < 0.05$  (one-tailed).

was found to be statistically different from Model 2, see Tables 4–6. Thus, in all three cases, *F*-tests could reject the null hypothesis that Model 2 (the reduced model) is nested in Model 5 (the full model).<sup>9</sup>

### 6.3. Robustness checks

The results of four robustness checks are presented in this section. The question is whether the results remain the same (1) when using different ways of constructing the variables measuring spatial location satisfaction and bonding social capital, (2) when excluding income, (3) when excluding income and including a dummy for non-response to income, and (4) when controlling for regional fixed effects. The results of the robustness checks and main results found in the previous section are shown in Table 9.

In Model 2 in Table 9, the first robustness check considers alternative constructions of the two variables measuring spatial location satisfaction and bonding social capital. In the analyses in the previous section, these two variables were entered as dummy variables (perfect spatial location satisfaction or not and strong local solidarity or not). The robustness check uses the original variables, that is, the variables with non-collapsed categories. As mentioned earlier, spatial location satisfaction is measured by the distance between the respondent's actual and preferred residential environment when considering the five area types: (1) a large city, (2) a medium-sized city, (3) a small town, (4) a village, and (5) in the countryside. The robustness check uses a variable with five match types instead of only one. These five match types are the following: perfect match (no distance), high match (distance of 1 category), medium match (distance of 2 categories), low match (distance of 3 categories) and very low match (distance of 4 categories). With regards to the bonding social capital variable, the robustness check uses the original variable that holds five categories instead of only one, see Table 1. Model 2 in Table 9 shows that using the new variables for spatial location satisfaction and bonding social capital does not significantly change the main results that were found in the previous section. The coefficients for the most densely populated area types (city, city area, and urban municipalities) are still statistically insignificant.

The second robustness check considers the low response rate for income. As can be seen from Model 3 in Table 9, the main results are unaffected by the exclusion of income from the regression analyses. Thus, excluding income – and thereby drawing on larger samples – also produced statistically insignificant coefficients for the most densely populated area types (city, city area, and urban municipalities). If anything, the *t*-statistics get smaller when excluding income.

The third robustness check considers the possibility of differential non-response to income between urban and rural respondents. In the raw figures, the income non-response rate does not vary greatly across area types. Across the area types in the first, second and third rural-urban classification, the non-response rates only vary within the following ranges: 24–28%, 24–26%, and 24–27%, respectively. Also,  $\chi^2$  tests could not reject the null hypothesis of independence between non-response to income and area type in all three rural-urban classifications, as *p*-values in these tests turned out to be 0.64, 0.62, and 0.48, respectively. In addition, Model 4 in Table 9 shows that the included dummy variable for non-response to income is statistically insignificant. Again, this leaves behind statistically insignificant coefficients for the most densely populated area types in the regression analyses. To sum up, there are no signs of differential non-response to income between urban and rural respondents, and there is no evidence to suggest that a differential non-

<sup>9</sup> The *F*-test is performed on Model 5 and tests the null hypothesis that the coefficients of the three variables perfect spatial location satisfaction, strong solidarity, and nature amenities are simultaneously equal to zero. The *F*-test statistics with respect to the first, second, and third rural-urban classifications were 9.0, 8.7, and 8.8, respectively, and the associated *p*-values were all smaller than 0.0001. The likelihood ratio test could not be performed because of the presence of robust standard errors in the models.

**Table 8**  
Determinants of the life satisfaction among residents living in specific area types.

	First rural-urban classification					Second rural-urban classification			Third rural-urban classification			
	In the countryside	Village	Smaller town	Medium-sized town	City	Rural area	Town area	City area	Peripheral municipality	Rural municipality	Intermediate municipality	Urban municipality
Perfect spatial location satisfaction	-0.194 (-0.69)	0.231 (1.29)	0.244 (1.24)	0.158 (0.66)	-0.128 (-0.64)	0.156 (1.11)	0.190 (1.14)	-0.039 (-0.19)	0.305 (1.60)	0.088 (0.55)	-0.018 (-0.11)	0.213 (1.23)
Strong solidarity	0.248 (1.06)	0.455** (2.31)	0.396** (2.34)	0.207 (1.04)	0.099 (0.38)	0.351*** (2.66)	0.259* (1.80)	0.166 (0.60)	0.376** (2.29)	0.348** (2.39)	0.295* (1.94)	0.268 (1.50)
Nature amenities	0.098* (1.76)	0.044 (0.96)	0.012 (0.27)	0.146** (2.26)	0.094** (2.31)	0.065** (2.05)	0.108* (1.95)	0.036 (0.80)	0.062 (1.49)	0.060 (1.44)	0.140*** (2.73)	0.083* (1.80)
Number of observations	173	298	393	313	180	597	599	161	355	351	328	323
Adjusted $R^2$	0.232	0.106	0.125	0.192	0.283	0.101	0.194	0.185	0.114	0.117	0.158	0.185

Notes: Ordinary least squares (OLS) regressions with life satisfaction (on a 10-point scale) as dependent variable. The same control variables as in Tables 4–6 are included in all estimations.  $t$ -statistics in parentheses. \*\*\* $p < 0.01$  (two-tailed), \*\* $p < 0.05$  (two-tailed), \* $p < 0.05$  (one-tailed).

**Table 9**  
Main regression results and robustness checks.

	Main regression results	Using coding of spatial location satisfaction on a 5-point scale and using original item on solidarity within local community on a 5-point scale	Without income	Without income and with dummy for non-response to income	With regional dummies
	Model 1	Model 2	Model 3	Model 4	Model 5
In the countryside (reference)					
Village	-0.107 (-0.71)	-0.111 (-0.72)	-0.034 (-0.26)	-0.032 (-0.24)	-0.108 (-0.71)
Smaller town	-0.221 (-1.49)	-0.213 (-1.39)	-0.153 (-1.15)	-0.154 (-1.16)	-0.236 (-1.59)
Medium-sized town	-0.056 (-0.37)	-0.042 (-0.27)	-0.048 (-0.36)	-0.048 (-0.36)	-0.061 (-0.39)
City	-0.205 (-1.27)	-0.153 (-0.96)	-0.080 (-0.55)	-0.080 (-0.55)	-0.195 (-1.16)
Income non-response				-0.059 (-0.63)	
Number of observations	1357	1357	1787	1787	1357
Adjusted $R^2$	0.156	0.162	0.168	0.167	0.155
Rural area (reference)					
Town area	0.030 (0.30)	0.040 (0.41)	-0.019 (-0.22)	-0.020 (-0.23)	0.031 (0.31)
City area	-0.099 (-0.77)	-0.075 (-0.58)	-0.071 (-0.61)	-0.071 (-0.61)	-0.077 (-0.54)
Income non-response				-0.056 (-0.59)	
Number of observations	1357	1357	1787	1787	1357
Adjusted $R^2$	0.155	0.161	0.168	0.167	0.155
Peripheral municipality (reference)					
Rural municipality	0.109 (0.98)	0.099 (0.89)	0.152 (1.59)	0.154 (1.61)	0.143 (1.25)
Intermediate municipality	-0.079 (-0.70)	-0.089 (-0.79)	0.011 (0.11)	0.013 (0.14)	-0.105 (-0.87)
Urban municipality	-0.128 (-1.05)	-0.123 (-1.01)	-0.113 (-1.04)	-0.112 (-1.02)	-0.150 (-1.08)
Non-response to income				-0.060 (-0.64)	
Number of observations	1357	1357	1787	1787	1357
Adjusted $R^2$	0.158	0.164	0.172	0.172	0.158

Notes: Ordinary least squares (OLS) regressions with life satisfaction (on a 10-point scale) as dependent variable. The same control variables as in Tables 4–6 are included in all estimations.  $t$ -statistics in parentheses.

response to income has impacted the main results.

The fourth and last robustness check considers the possibility that the three rural-urban classification variables do not act as entirely exogenous variables in the regressions. Although a wide range of important control variables were included in the regressions, there is still the possibility of unobserved heterogeneity. Thus, an attempt was made to adjust for unobserved heterogeneity at the regional level by including dummies for the administrative regions of Denmark: Region Northern Jutland, Region Central Jutland, Region South Denmark, Region Zealand, and Region Capital City. These are the five Danish European Union NUTS-2 (Nomenclature des Unités Territoriales Statistiques) territories. As the 98 municipalities belong to each their region in Denmark, the regional location of the respondents could be established through their self-reports of the municipality they live in. When including regional dummies in Model 5 in Table 9, the results remain unchanged. Thus, the coefficients for the most densely populated area types (city, city area, and urban municipalities) are still statistically insignificant.

To conclude, the results found in the previous section proved to be very robust. In each robustness check, the rural-urban difference in life satisfaction remained statistically insignificant. The robustness checks thus confirmed the previous finding that the main part of the rural-urban difference in subjective well-being in Denmark can be explained by rural-urban differences in bonding social capital and access to nature amenities.

## 7. Conclusion

In this paper, a unique Danish survey was used to explore the rural happiness paradox in developed countries. This paradox revolves around the observation that rural residents tend to report higher subjective well-being than urban residents in developed countries, whereas the opposite is the case generally for developing countries (Easterlin et al., 2011; Requena, 2016). By using three rural-urban classifications, the paper provides a solid confirmation of the rural happiness paradox in Denmark. The results show that regardless of rural-urban classification the rural happiness paradox in Denmark is still evident after adjusting for important socio-economic variables such as gender, age, health, education, employment status, and income.

The paper tests three hypotheses regarding the factors behind the rural happiness paradox. The paper finds that higher bonding social capital in rural areas and higher access to nature amenities in rural areas substantially contribute to the rural happiness paradox in Denmark. However, the paper finds no significant evidence that rural-urban differences in spatial location satisfaction (measured by the correspondence between actual and preferred residential location on the rural-urban continuum) also contribute to the rural happiness paradox. It was hypothesized that urban residents are less satisfied with their choice of residential environment than rural dwellers, and that this would have a downward impact on the subjective well-being of urban residents. However, while the paper did find a significant positive relation between spatial location satisfaction and life satisfaction, spatial location satisfaction in the Danish case did not turn out to be highest per se in rural areas across the three rural-urban classifications.

In the Danish case, the level of education turned out to hardly matter to subjective well-being, and the level of income was not found to be among the most important predictors of subjective well-being. This may be owing to the high economic equality in the Danish society which has been achieved through state-driven wealth redistribution throughout many years. When a relatively generous basic income is secured by the state, soft factors take over and become more important parameters of subjective well-being. Thus, the soft parameters of bonding social capital and access to nature amenities were found to be strong predictors of individual well-being in Denmark. Overall, as rural residents score higher on these two soft parameters, this seems to provide the main explanation of the rural happiness paradox in Denmark. It would be very interesting to see future studies in other developed countries that differ from Denmark addressing the same issues as raised in this paper.

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