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The case of Denmark

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Using a new method to map quality of life: The case of Denmark

Rolf Lyneborg Lund

Introduction

While neighbourhood studies are on a rise, almost none of the research done on neighbourhood studies considers the main characteristic of the research, the neighbourhood. The change in the rural/urban demographic composition is continually accelerating at different speeds, and the number of neighbourhood studies within the social sciences has increased. Since the early Chicago School (Park & Burgess, 1925), social scientists have been interested in the local dynamics of people and have asked questions revolving around a simple thesis: the local setting, be it social or structural, has an impact on the individuals living there. The studies that fall within this thesis range from the very tangible and directly measurable physical concepts such as pollution (Diekmann & Meyer, 2010; Huppé et al., 2013; Jayaraman & Nidhi, 2008), housing quality (DeSilva et al., 2012; Doocy et al., 2007; Filandri & Olagnero, 2014; Hwang, 2015; Lu & Song, 2006; Peng et al., 2009; Sampson, 2008) and health (Johnson et al., 2017; Krieger, Waterman, et al., 2017; Newbold et al., 2013; Yoon et al., 2015) to other studies more centred around the deprivation thesis. The latter studies often focus on the composition of the local neighbourhood such as overall income levels, unemployment rates, crime rates or similar characteristics (Galster, 2010; Garner & Raudenbush, 1991; Gieryn, 2002; Johnson et al., 2017; Leventhal & Brooks-Gunn, 2000; Lund, 2019, 2020; Potter et al., 2012; Sampson, 2012). Overall, these studies focus on neighbourhood and are all informed by information either inherent in, or social phenomena that occur around, the neighbourhood.

Quality of life often fits in either of these categories but is often overlooked. There are two overall reasons for the lack of studies within this field. The first revolves around the information needed to measure quality of life. While medical journals often reduce 'quality of life' to a physical aspect, social scientists are more interested in the perceived quality of life in the sense of happiness, satisfaction or joy (Lolle & Andersen, 2016). These questions

are hard to gather by proxy. Even if we have no information about income, we can use house price as a proxy, but we have no way of knowing how a person feels solely from proxies. This requires the researcher to ask either through a qualitative interview or operationalised through a survey, and survey data on especially smaller, geographically enclosed entities are less common than administratively gathered data. The second reason is based on *how* we measure quality of life. To what extent is an individual able to discern ‘subjective quality of life’ when asked about it and to what extent is this transferable over geographical distances? This is, to some extent, the first question of this chapter: ‘How does subjective quality of life differ in Denmark?’ and this leads to a more focused question: ‘How is subjective quality of life perceived differently between varying degrees of rurality?’

By utilising a new methodology to capture data at neighbourhood level, and by using computational methods of geographical clustering described later in this chapter, it is possible to disentangle not only rural as an overall category but to capture different types of rurality and compare this to different types of urbanity. Is quality of life the same in deprived neighbourhoods in rural settings as it is in deprived neighbourhoods in urban settings? This chapter will attempt to answer this question while illuminating how place of living affects our perceived quality of life.

Neighbourhoods and quality of life

Most of us have a clear understanding of what a neighbourhood is because we, with a few exceptions, live in one. We can mentally conceptualise that we live in a municipality that contains a city or town that again contains sections of that city/town that again contains our local neighbourhood that can be reduced all the way down to our dwelling. The problem often arises when we must describe the above entities. We have a common way of expressing our municipality and city since they have official, administrative names. We can easily distinguish between these, and no matter with whom we talk, we can point to a map where that name exists. If the city is large enough, we even have administrative names for subdivisions. The same can be said for the street we live on and the dwelling we reside in; it has a name and number. However, we have no common recognition for the neighbourhood – it might have a name but often these names are either very local or vary to a degree that only residents within the neighbourhood can recognise, and often the neighbourhood is an unnamed entity that even varies in size and location if multiple individuals are asked to define it.

Neighbourhood matters. Not only in tangible ways such as housing quality and access to goods but in the sense that the local cohesion directly and measurably impacts both everyday life and life course events (Jørgensen

et al., 2016, 2021; Lund, 2020). In short, quality of life differs over distance (Dissart & Deller, 2000). Not only do we know that bigger cities in Europe are some of the most segregated when it comes to income, educational attainment and labour market affiliation (European Commission, 2017), the same can be found in almost all cities in Denmark (Lund, 2019). The problem is that this intracity segregation is hard to measure – as noted, most data is collected at administrative levels and thus research is often restricted to using whatever geography is available at the smallest level.

With the lack of an overall administrative approach to neighbourhoods, research into smaller neighbourhoods is often based on administrative definitions such as parishes, cities or census tracts (Bellavance et al., 2007; Lund, 2019; Ruggles, 2014; Sampson & Sharkey, 2008). In most cases, this results in the same problem it was meant to solve – administrative areas are, even at a smaller level, unsatisfactory containers for social life. There are studies that focus on an even smaller local neighbourhood level of aggregation (Bower et al., 2014; Jones & Pebley, 2014; Logan et al., 2011; Malmberg et al., 2011; Wodtke et al., 2011) and the argument for a very small aggregation level is to isolate whatever research aim one has to exclude as much ‘noise’ as possible. Where some studies use smaller administrative areas such as census tracts consisting of either block-level or street-level data as in some American studies (Bower et al., 2014; Gage et al., 1986; Krieger, Feldman et al., 2017) or smaller statistical units of measurement as the Small Areas for Market Statistics (SAMS) used in Sweden (Lagerlund et al., 2015; Merlo et al., 2013), others use more inductive clustering techniques such as k-means clustering or Bayesian methods (Ferreira et al., 2011; Johnelle Sparks et al., 2013; Malmberg et al., 2011; Östh et al., 2015; Petrović et al., 2017). Where studies that utilise smaller sets of administrative data are more precise in isolating the local area, they still fail to account for the actual distribution inside the neighbourhoods and do not account for homogeneity. Lack of homogeneity is normally not considered a problem if the unit of measurement is expected to be heterogeneous, but since especially neighbourhood-level statistics are known to cluster in socio-economic homogeneous groups based on housing price and overall market value, we expect that the clusters are homogeneous based on parameters like income. This is also the reason why so much neighbourhood research is directly concerned with effects from within a neighbourhood – the inhabitants are thought of as a group that can affect each other because of their somewhat shared background. In the end, it is impossible to know if the lower internal heterogeneity is a result of simple data smoothing¹ or because the administrative areas capture the local better.

1 As seen in Lund, 2018.

These discussions are important when considering neighbourhood-level data and especially the effects thereof. This chapter will investigate how the introduction of small-scale neighbourhood-level statistics affects the perceived quality of life at different degrees of urbanism (Lund, 2018).

Methodology and data

Data for this chapter was obtained from three different sources: (1) geographical grid data from the Danish Geodata Agency, (2) data describing area-level as well as individual-level socio-economic traits from Statistics Denmark and (3) the survey 'Quality of Life in Denmark' as described in Chapter 1.

Geographical grid data. The georeferenced data consists of the national square grid that divides Denmark into vectors of 100m × 100m cells and topographical maps that contain information about buildings, roads, rivers, railroads etc. The georeferenced data is linked to the registers, but since Statistics Denmark has very strict discretion criteria for anonymity, the data must be clustered to at least 100 inhabitants per measurable geographical unit before further linking to individual-level data

SES data. Data on socio-economic status on both individual and area level was obtained from Statistics Denmark for the year 2015 to match with the survey data. Data used to characterise SES on both an individual level and area level consists of information about educational attainment (total months of full-time education), labour force affiliation (percentage of year unemployed), income (measured as spendable income), debt (total), private ownership of property (assets in housing with debt deducted) and job status in ISCED format (Ganzeboom & Treiman, 2010). Area-level data was aggregated to capture overall area characteristics while retaining the individual-level data as well. Three other variables (gender, age and ethnicity) were included to control for confounding effects.

Survey data. The survey data was collected between 2015 and 2016 by Statistics Denmark where they surveyed the whole of Denmark but with a focus on thirty-eight specific municipalities; this will be evident when looking at neighbourhood-level data later. N is 42,500, where around 2,500 have no identifiable geographical information and 8,000 more have missing information in regard to some of the socio-economic measurements used to create the composite items described later. Thus, total N for the descriptive analysis is 40,000, while the regression analysis is restricted to 32,642 respondents. For a thorough description of the data, please refer to Chapter 18 (Lolle).

Spatial modelling

To capture the local neighbourhood effect, this study involved an automated redistricting based on an inductive, recursive algorithm to isolate smaller,

socio-economic clusters (Lund, 2018). While it is methodologically challenging to measure the ways individuals create and maintain social communities, the ways landscapes seem to facilitate this is not (Entwisle et al., 1997; Feld, 1981; Lund, 2018, 2019; White et al., 2005). The shaping of cities, communities and housing follows principles of closeness and these entities are separated by way of physical barriers such as roads, railways, rivers, lakes, forests or other objects that may not have been intended as separators but often act as ones (Feld, 1981; Lund, 2018). Using this logic, micro-areas were established by examining the way individuals cluster in an already existing geography. The methodology involved two distinct steps: first, a definition of rules for overall geographical subdivision and measures to secure that a minimum number of inhabitants is located in each geographical entity; second, clustering based on strict discretion criteria. As mentioned, using Danish register data involves very specific discretion rules when it comes to geographical clustering and requires at least 100 inhabitants per geographical unit before an actual merge between geography and individual data can be performed.

This requires further steps that are optimised to secure four separate criteria: (1) having at least 100 inhabitants per area, (2) merge areas so that as few merges as possible take place, (3) merge areas so that the areas are as geographically small as possible and (4) merge so that merges as close to the 100 rule is possible. These criteria were made to secure areas that are small in terms of geographical area as well as inhabitant-wise. The overall advantage of this optimisation is that merge solutions can be evaluated objectively, and the most optimal version can be selected.

While this methodology is applicable to most data that can be linked to geography, it has been designed to work with large-scale register data. Thus, the issue of the methodology in this setting is the somewhat fragile smaller areas when using non-population-based surveys. As described later, this still captures overall neighbourhood effects because homogeneity of the overall neighbourhood population is captured from register data, but it lacks the same when looking solely at survey data. Nonetheless, capturing neighbourhood effects by looking at actual neighbourhoods compared to administrative borders is by far an advantageous approach, as shown in this chapter.

Furthermore, these neighbourhoods are also linked to municipality-level data as well as the four-way classification of municipalities created by the Ministry of Food, Agriculture and Fishery to describe the level of urbanism of each municipality (Ministeriet for Fødevarer Landbrug og Fiskeri, 2011). Each municipality is classified based on the items seen in Table 21.1.

These indicators are then added to create the rurality index and municipalities are classified as either outer, rural, semi-urban or urban municipalities. In Denmark, there are currently sixteen municipalities classified as outer,

Table 21.1 Classification of municipality type.

| | |
|---------------------------|---|
| Urbanisation | Number of inhabitants |
| | % of inhabitants in cities within the municipality with >1,000 inhabitants |
| | Percentage of area used for agriculture |
| Centre/periphery | Average distance to nearest highway |
| | % of job positions compared to % employed |
| | Average point distance to an area within the municipality with a large surplus of job vacancies |
| Importance of agriculture | % employed in agriculture |
| Demographic trends | Trend of employment in a 10-year period |
| | Trend of population growth in a 10-year period |
| Demography | % of population between the age of 17 and 64 |
| | % of population between the age of 25 and 44 |
| Education | % of inhabitants with only primary-level education |
| | % with at least bachelor-level education attainment |
| Economy | Per capita tax base |

thirty as rural, seventeen as semi-urban and thirty-five as urban as seen in Figure 21.1.

While there are some criteria in the list that are bound by economic tendencies that are also captured within the deprivation index described below, the main objective of the four categories is to define municipalities in regard to their geographical setting and their overall proximity to either larger cities or to agriculture. Thus, rurality is mainly a question about distance and function and not directly related to socio-economics.

Scale construction

The items used to measure quality of life are based on three overall concepts: subjective life satisfaction (satisfaction 1), personal feelings about life (unhappiness) and composite life satisfaction (satisfaction 2). Subjective life satisfaction is a single item where respondents were asked: ‘All in all, how satisfied are you with your life these days?’ The respondent can choose values between 0 (very dissatisfied) and 10 (very satisfied), which is the case for all following items described in this section. This captures a very

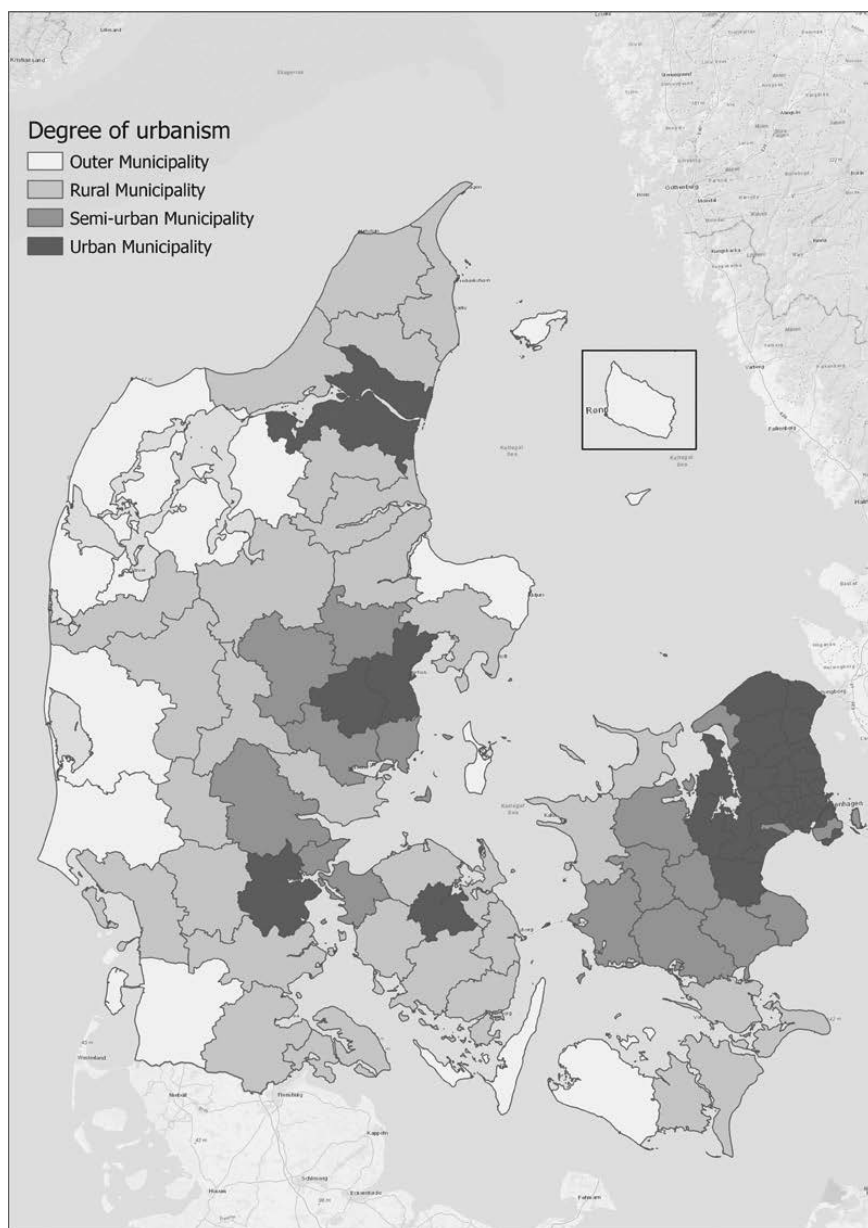


Figure 21.1 Municipality classifications of Denmark.

subjective but also very clear indicator for life satisfaction, but might lack the specific elements of life satisfaction – to what extent does each life component add to the value chosen? To capture different elements of life satisfaction, a composite measurement is created using the questions: ‘How satisfied are you with your family life?’, ‘How satisfied are you with your social relations?’ and ‘How satisfied are you with your daily life?’ The composite scale is created as a standardised measurement ranging from 0 to 10 ($\alpha=0.78$), and even though there is a high level of correlation between the single item in subjective life satisfaction and the composite measurement (.70) there is still a 30 per cent variance that captures different elements of life satisfaction. Personal feelings about life consist of three different items: ‘To what extent did you feel happy yesterday?’, ‘To what extent did you feel worried yesterday?’ and ‘To what extent did you feel sad yesterday?’ As with the other composite measurement, the scale has been standardised ranging from 0 to 10 ($\alpha=0.79$). This composite, in contrast to the other two, has a stronger focus on negative feelings and thus will capture the dynamic of overall life satisfaction compared to the possible negative feelings the respondent might also experience from day to day.

When measuring neighbourhood deprivation, only register data information is used and thus it becomes possible to capture the full dynamic of the neighbourhood without being restricted to survey information. As a result, neighbourhood-level deprivation is calculated on the whole population in 2015 and 2016 (averaged), $N=5,615,365$. Three overall measurements were used: median neighbourhood income, percentage of neighbourhood inhabitants with only a primary level education, and yearly unemployment rate measured in days. The index has been normalised ranging from 0 (lowest level of deprivation) to 1 (highest level of deprivation). Furthermore, the neighbourhoods have been classified in deciles with the 1st decile being the least deprived and the 10th being the most.

Overall, quality of life can comprise a wide variety of items, and survey data in combination with register data is one way of approaching this subject. The focus of this chapter will be on mapping and understanding the spatial elements of the theme, and thus quality of life in this chapter is reduced to two different measurements of perceived quality of life and one measurement for capturing the negative aspects of life.

Quality of life in Denmark

Subjective quality of life in Denmark is overall very homogeneous. There are instances with low level of subjective quality of life, but these are mostly at an individual level. Furthermore, the average life satisfaction score is above 7,

almost no matter the aggregation level of the data. Nonetheless, there are variances and, in some cases, relatively large variances between adjacent neighbourhoods. Looking at quality of life in Denmark, it is as varied as can be.

Looking at Figure 21.2, we see how the survey sampling only captured parts of Denmark and in some areas focused only on the larger cities. Only areas with more than ten survey respondents are shown due to discretion, and maps shown only include the average of the single-item quality of life question as described above. While South Denmark, parts of North Denmark, Fyn and the Capital area are all very well sampled, large parts of Middle Jutland, Northern Jutland and Eastern Zealand are only sampled in the main cities.

While this only covers some parts of Denmark, there is an even distribution between rural/urban settings and thus the range of the data is still representative within the overall framework when comparing degree of urbanism to different levels of quality of life. Comparing the municipality maps (Figure 21.3) with neighbourhood-level data (Figure 21.2), many of the internal differences in subjective quality of life are masked at municipality level, where bluer colours indicate lower levels of life satisfaction and brighter purple colours indicate higher levels. Looking at the close-up of, for example, Copenhagen (upper right picture, Figure 21.3), we see that major differences are located within just a single municipality of Copenhagen having adjacent neighbourhoods with around a 10 per cent difference in life satisfaction measured as neighbourhood averages on the life satisfaction scale. This is also true of the three other largest cities in Denmark. The full spectrum of variance is present within a single municipality and between neighbourhood-level data, which implies that life satisfaction is highly local.

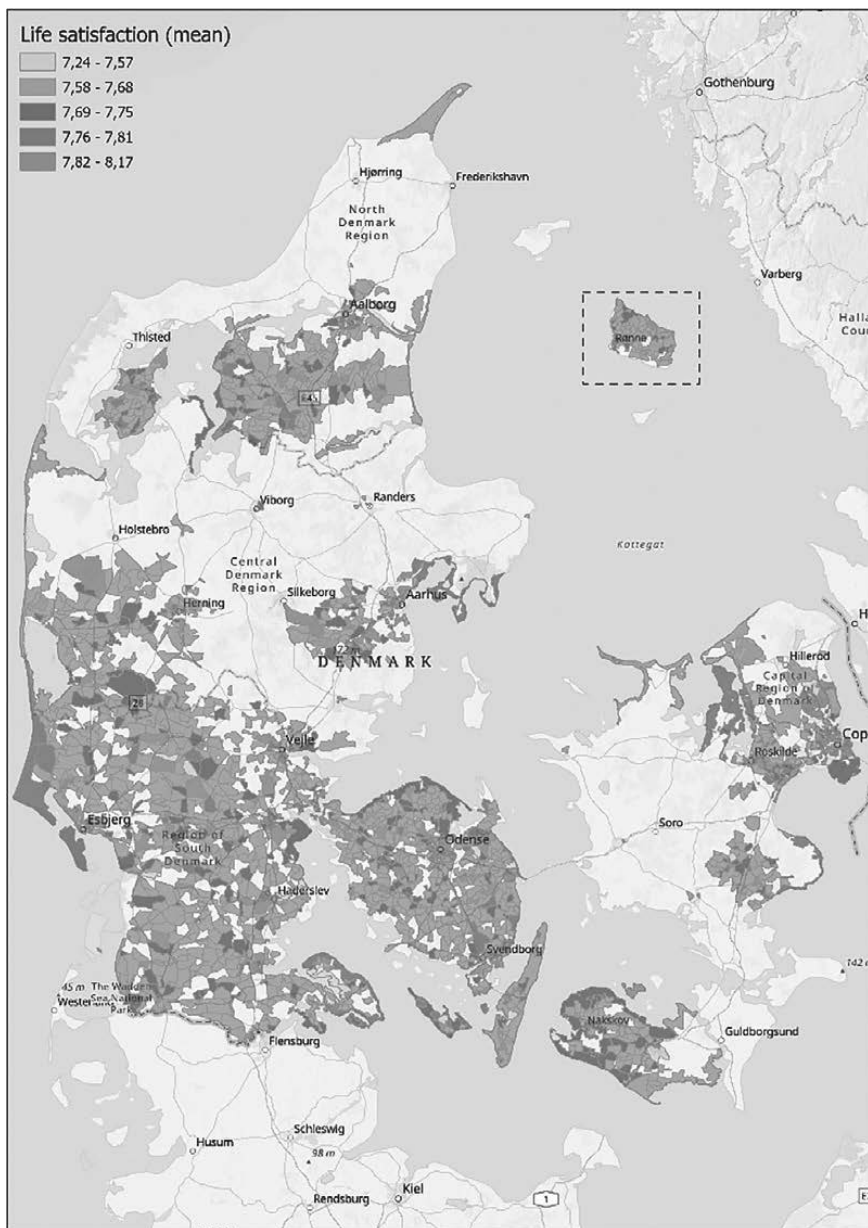
Table 21.2 presents the three measurements of quality of life on municipality level and categorised within the four overall categories used to classify the level of urbanism in Denmark, as described earlier. Looking at the two categories of satisfaction, both indicate a generally high level of life satisfaction with only small differences between the two measurements, while a small trend is visible when comparing the different degrees of urbanism.

Where the single-item satisfaction measurement decreases by .14 from outskirts to urban environments, the composite decreases by .22. This is only a very small change percentage-wise, with no more than a 2.2 per cent decrease in satisfaction. The same can be said about composite unhappiness, where the change is 3.2 per cent. While this is considerably less than the variation seen with neighbourhood-level satisfaction (see Figures 21.2 and 21.3), there are still small trends to imply less satisfaction in urban environments.

In Table 21.3, neighbourhoods are instead divided into degree of deprivation split in deciles, where the 1st decile is the least deprived and the 10th



Figure 21.2 Neighbourhood (a) and municipality (b) distribution of life satisfaction.



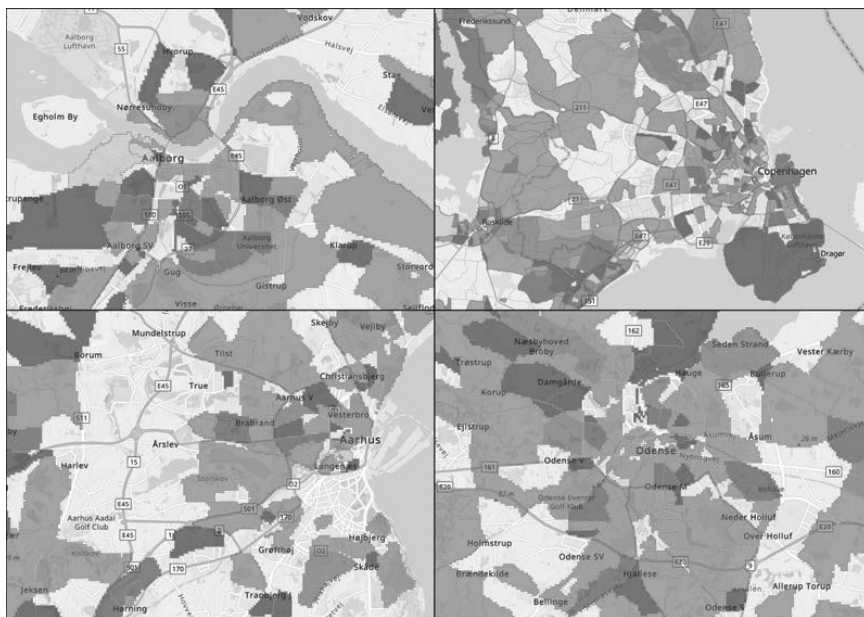


Figure 21.3 Neighbourhood distribution of life satisfaction in the four largest cities.

is the most. As noted earlier, Danes are, in general, very happy about their everyday lives but there is still variation within overall degrees of deprivation and life satisfaction. The change in the single item of composite satisfaction is 2.5 per cent and 2 per cent between the most and least deprived neighbourhoods, while the composite scale for unhappiness varies a little less than 3 per cent.

While this is almost the same change found in Table 21.2, it implies that the change is bound to the levels of urbanism as well as levels of deprivation. This suggests that there might be a correlation between deprivation and urbanism. Table 21.4 is divided into both degree of urbanism and level of deprivation to compare the effects of deprivation in different geographical settings.

Combining degree of deprivation with degree of urbanism has captured most of the effect seen between the neighbourhoods with most and least amount of life satisfaction, where the most satisfied are located in the richer, outskirts areas while the least satisfied are in poorer, urban areas. This, however, adds no control for individual-level indicators. In Table 21.5, the three different measures of life satisfaction are added in groups of two different controls. Models 1, 3 and 5 in each indicator include only individual-level

Table 21.2 Distribution of well-being on degree of urbanism.

| Urbanism | Satisfaction 1 | Satisfaction 2 | Unhappiness |
|------------|----------------|----------------|-------------|
| Outskirts | 7.76 | 7.98 | 2.55 |
| Rural | 7.73 | 7.91 | 2.60 |
| Semi-urban | 7.62 | 7.83 | 2.67 |
| Urban | 7.62 | 7.76 | 2.71 |

Table 21.3 Distribution of well-being on level of neighbourhood deprivation.

| Level of deprivation | Satisfaction 1 | Satisfaction 2 | Unhappiness |
|----------------------|----------------|----------------|-------------|
| 1st decile | 7.78 | 7.92 | 2.58 |
| 2nd decile | 7.77 | 7.92 | 2.65 |
| 3rd decile | 7.78 | 7.96 | 2.59 |
| 4th decile | 7.66 | 7.85 | 2.62 |
| 5th decile | 7.68 | 7.88 | 2.63 |
| 6th decile | 7.68 | 7.84 | 2.61 |
| 7th decile | 7.67 | 7.87 | 2.62 |
| 8th decile | 7.65 | 7.88 | 2.65 |
| 9th decile | 7.71 | 7.90 | 2.62 |
| 10th decile | 7.53 | 7.72 | 2.72 |

items, while models 2, 4 and 6 include a simple form of dummy control for degree of urbanism. Since the results are from survey data, the neighbourhood effect in models 2, 4 and 6 is added as an individual effect and not as a dummy control in the form of $Y = (\alpha + \gamma_{ij}) + \beta_i X_i + \varepsilon_i$ where γ_{ij} is the j th urbanism category for the i th person. This could technically be done for the deprivation index as well, but since the regression is done on survey data, the dummy control for more than 5,000 individual areas would result in a potentially fragile and skewed model, since each dummy for area would contain, in some cases, only a single observation.

The individual-level factors in models 1, 3 and 5 indicate that educational attainment primarily affects single-item and composite satisfaction. While the effect indicates that higher levels of educational attainment decrease the overall level of life satisfaction, the effects found must be said to be primarily of theoretical significance. Comparing the full range of educational attainment, this only affects satisfaction with .1 per cent in the satisfaction

Table 21.4 Distribution of well-being on neighbourhood deprivation and degree of urbanism.

| Urbanism | 1st decile | 2nd decile | 3rd decile | 4th decile | 5th decile | 5th decile | 7th decile | 8th decile | 9th decile | 10th decile |
|-------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|
| Outskirts | | | | | | | | | | |
| Satisfaction 1 | 8.03 | 7.74 | 8.10 | 7.80 | 7.79 | 7.86 | 7.73 | 7.71 | 7.75 | 7.64 |
| Satisfaction 2 | 8.07 | 8.00 | 8.22 | 7.98 | 7.95 | 8.01 | 7.97 | 7.98 | 7.99 | 7.89 |
| Unhappiness | 2.44 | 2.51 | 2.52 | 2.58 | 2.57 | 2.51 | 2.54 | 2.58 | 2.54 | 2.54 |
| Rural | | | | | | | | | | |
| Satisfaction 1 | 7.79 | 7.88 | 7.76 | 7.65 | 7.76 | 7.70 | 7.75 | 7.69 | 7.76 | 7.56 |
| Satisfaction 2 | 7.95 | 8.00 | 7.99 | 7.85 | 7.94 | 7.88 | 7.93 | 7.91 | 7.95 | 7.72 |
| Unhappiness | 2.57 | 2.53 | 2.59 | 2.64 | 2.60 | 2.54 | 2.55 | 2.62 | 2.60 | 2.73 |
| Semi-urban | | | | | | | | | | |
| Satisfaction 1 | 7.80 | 7.75 | 7.76 | 7.63 | 7.44 | 7.54 | 7.50 | 7.61 | 7.79 | 7.36 |
| Satisfaction 2 | 8.02 | 7.92 | 7.95 | 7.85 | 7.78 | 7.70 | 7.73 | 7.85 | 7.96 | 7.58 |
| Unhappiness | 2.56 | 2.68 | 2.48 | 2.56 | 2.67 | 2.72 | 2.78 | 2.73 | 2.60 | 2.94 |
| Urban | | | | | | | | | | |
| Satisfaction 1 | 7.76 | 7.71 | 7.71 | 7.58 | 7.51 | 7.45 | 7.48 | 7.18 | 7.51 | 7.32 |
| Satisfaction 2 | 7.89 | 7.86 | 7.85 | 7.74 | 7.73 | 7.60 | 7.63 | 7.31 | 7.60 | 7.39 |
| Unhappiness | 2.59 | 2.73 | 2.67 | 2.65 | 2.75 | 2.84 | 2.87 | 2.99 | 2.78 | 2.98 |

Table 21.5 Regression models.

| | Satisfaction single item | | Satisfaction composite | | Unhappiness composite | |
|-----------------------------|--------------------------|------------|------------------------|------------|-----------------------|------------|
| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 |
| Educational length (months) | −0.0007* | −0.0007* | −0.0025*** | −0.0024*** | 0.0003 | 0.0002 |
| | (0.0004) | (0.0004) | (0.0003) | (0.0003) | (0.0004) | (0.0004) |
| Unemployment (days of year) | −0.0011*** | −0.0011*** | −0.0008*** | −0.0008*** | 0.0004*** | 0.0004*** |
| | (0.0001) | (0.0001) | (0.0001) | (0.0001) | (0.0002) | (0.0002) |
| Income | 0.0000*** | 0.0000*** | 0.0000 | 0.0000 | −0.0000 | −0.0000 |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| Age | 0.0066*** | 0.0061*** | 0.0103*** | 0.0097*** | −0.0074*** | −0.0070*** |
| | (0.0008) | (0.0008) | (0.0007) | (0.0007) | (0.0009) | (0.0009) |
| Ethnicity | −0.1513*** | −0.1214** | −0.3141*** | −0.2857*** | 0.6266*** | 0.6109*** |
| | (0.0515) | (0.0518) | (0.0434) | (0.0436) | (0.0566) | (0.0569) |
| Male | −0.0732*** | −0.0737*** | 0.1920*** | 0.1918*** | 0.1678*** | 0.1679*** |
| | (0.0229) | (0.0229) | (0.0193) | (0.0193) | (0.0251) | (0.0251) |
| Deprivation index | | −0.4438*** | | −0.3803*** | | 0.2007 |
| | | (0.1127) | | (0.0947) | | (0.1234) |

(continued)

Table 21.5 (Cont.)

| | Satisfaction single item | | Satisfaction composite | | Unhappiness composite | |
|--|--------------------------|------------------------|------------------------|------------------------|-----------------------|-----------------------|
| Degree of urbanism (outskirt ref.) | | | | | | |
| Rural | | -0.0778** (0.0315) | | -0.0995*** (0.0264) | | 0.0726** (0.0345) |
| Semi-urban | | -0.1501*** (0.0401) | | -0.1459*** (0.0337) | | 0.0676 (0.0439) |
| Urban | | -0.1647*** (0.0364) | | -0.1879*** (0.0306) | | 0.1323*** (0.0399) |
| Constant | 7.6669*** (0.0806) | 7.9793*** (0.1066) | 7.5473*** (0.0678) | 7.8334*** (0.0896) | 2.6031*** (0.0883) | 2.4437*** (0.1168) |
| Observations | 26,600 | 26,600 | 26,567 | 26,567 | 26,562 | 26,562 |
| R-squared | 0.0070 | 0.0081 | 0.0171 | 0.0187 | 0.0104 | 0.0108 |
| Standard errors in parentheses ***p<0.001, **p<0.01, *p<0.05 | | | | | | |

measurements while insignificant when measuring unhappiness. The same can be said for income, but this is only significant in single-item satisfaction. Unemployment indicates that an increase in unemployment results in less life satisfaction, but again only to a small degree. The cumulative biggest effect can be found when looking at age, where older age results in less life satisfaction but, interestingly, also less unhappiness. This could be explained by more conservative responses with age and not using the outer categories as much. By far the biggest effect can be found when looking at ethnicity. Non-ethnic Danes are 6.2 per cent less happy than the ethnic Danes, even when controlling for other social and socio-economic factors.

Gender is interesting because the effects from the single-item satisfaction contradict the findings by the composite scale. The single-item measurement indicates that males are slightly less satisfied than females, but looking at the composite measurement, the opposite is true. This could be because the composite measurement considers specific parts of satisfaction like family life and social relations and thus requires a compartmentalisation. It might also be that since the effect of the single item is significantly smaller than in the other two, that they capture life satisfaction to a higher degree. Nonetheless, in the other model, women tend to be less satisfied. Interestingly, men also seem to be more unhappy. This could indicate a conflict, since although unhappiness is thought of as the opposite of life satisfaction, this is actually not the case. While life satisfaction is correlated with unhappiness at .5, it is still quite possible to be satisfied with family and social relations while also feeling sad and unhappy on a personal level. Thus, while men are more satisfied looking at the composite measurement, they are also experiencing higher levels of unhappiness.

Looking at the dummy control models (models 2, 4 and 6), there are no or only nominal changes to the effects of education, unemployment, income and gender. The primary reason for the socio-economic effects not changing is because they are already being captured by the area of residence, while gender might be independent from place of living. The effect of age drops slightly, which indicates that area deprivation as well as degree of urbanism moderates, if only slightly, the effect of age. Ethnicity is the variable on the individual level that is affected the most by place-specific control. Overall, the effect of ethnicity is reduced in all models and this could indicate that degree of urbanism absorbs some of that effect, but most likely it has to do with the fact that the direct migration of refugees often centres around urban environments.

The area-specific indicators are still highly significant with individual-level controls and the effects are in accordance with the descriptive statistics. An increase in deprivation results in lower levels of life satisfaction on both the single item and the composite item and a higher level of unhappiness.

Degree of urbanism, as seen earlier, has an effect on all items in the sense that higher levels of urbanism result in lower levels of life satisfaction and higher levels of unhappiness.

Discussion and conclusion

Quality of life in Denmark is equal parts uniform and highly varied. While Danes are, in general, very content with life and very happy, there are still comparatively large variances within small geographical entities. Denmark is unique in many ways, and since its relative size is so small, it makes it difficult to truly consider 'outskirts' of Denmark as outskirts. No matter the starting point, one can drive to any location (not considering islands) in five hours, so there are very few places that are truly remote. Nonetheless, Denmark has a sharp divide between urban and rural areas and considering mobility is more than just the driving distance to the nearest larger city, it is not surprising that the degree of urbanism affects the overall quality of life.

In this chapter, quality of life has been reduced to three overall measures: single-item satisfaction that deals with the question how the respondent, all in all, feels about life these days; composite satisfaction that deals with social relations, family life and daily life; and composite unhappiness that deals with sadness, happiness and feeling worried. In short, there is no single type of area (be it outskirts, rural, semi-urban or urban) that is free from variation at neighbourhood level. Likewise, there is no evidence to support that area type is in a direct causal relationship with quality of life, but there are trends that point to the fact that the outskirts are, in general, more content with life and less unhappy. There is virtually no difference when comparing the least deprived neighbourhoods in an urban setting with the most deprived neighbourhoods in the outskirts. The largest differences the data found is when comparing urban settings with their counterparts in the outskirts while also considering degree of deprivation. Subjective quality of life is rated much higher in the outskirts than in the urban environments on all three measurements and even when controlling for individual-level indicators, this effect persists. While degree of deprivation and urbanism cannot account for the full variation in quality of life, it is the single most explanatory combination present in this data.

These results are very much contrary to what one would find looking only at municipality-level data. Considering social life at the neighbourhood level draws out important differences within the socio-geographical landscape and adds a very important nuance to our interpretation of the data: even though the socio-economic mapping shows that the most well off often live

in the cities, quality of life is, though not by a large margin, higher at the neighbourhood level in the more rural areas than it is in urban settings.

This calls for a discussion of why. Why are neighbourhoods in the outskirts in general more content than their urban counterparts? First, it is important to notice that, in general, Denmark is a very content and happy country. The variances here are not between low and high quality of life but instead a small gradient within very high quality of life. Furthermore, the differences found here are based on subjective quality of life and not objective measurements such as health or socio-economics. This means that it reduces to a state of mind; to what extent do I feel content with my life? Nonetheless, this feeling is more persistent in the outskirts and rural parts of Denmark than in the urban parts, and one explanation could be that the way the question is ‘felt’ is different in the more rural parts. When asked ‘How do you feel about life’, it is up to you to decide what you consider ‘life’ and ‘feel’ to mean. Historically, the more rural parts of Denmark are based on traditions of farming and fishing and, to quote Hans Kirk when describing the sense of the early 1900s local western Jutlandish societies, ‘The fishermen of the western sea knew what they knew. God had whipped them with western winds, demise, and poverty. The catch had failed year after year, sand drift and sea mist had ravaged the parish and brothers and friends had drowned before their eyes’ (Kirk, 1928). The stark contrast to the cities has dissipated since the early 1900s, but the cultural phenomena still persist especially in the smaller towns – life is satisfactory if we have our health and don’t go hungry. This is, of course, just one perspective of a much larger aspect of quality of life. In the end, even though we do find differences and to some extent large differences, Denmark is still a country with an exceptionally high subjective quality of life. Nonetheless, the main takeaway from dissecting the geography and measuring quality of life at neighbourhood level is that even in neighbourhoods of close proximity there is evidence for a change in perceived quality of life – to fully capture phenomena such as happiness, sadness and contentedness one needs to accurately describe the settings from where these feelings are located and these are, as shown in this chapter, much more local than one might think.

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