

Explaining inter-area variation in Life-Satisfaction

- matched survey and register data

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Abstract. The paper focuses on the age-profiles of life-satisfaction within municipalities with different degrees of urbanization in Denmark to explore inter-area variation in life-satisfaction, and investigates if being a resident means a higher level and a less pronounced age-profile of life-satisfaction compared with being a newcomer to a municipality. The paper also investigates if movers are more satisfied with their income – domain satisfaction – than stayers. This is based on the expectation that the factor driving mobility is to achieve better job and income conditions and, hence, improving one’s life-satisfaction. To investigate this issue we not only use the general life-satisfaction question but also the question about income satisfaction or satisfaction with the financial situation.

The data are from Statistics Denmark’s measurement of well-being, which contains both data from administrative registers used for the production of regular statistics and survey data from a major survey on subjective life satisfaction measurements.

Because the data are cross-sectional the different relationships are not necessarily causal and for that reason policy recommendations are to be drawn with caution. However, the question addressed here about the regional aspect and the question about residency will still be of importance for policy makers.

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Introduction

Within the life-satisfaction literature there has been a growing attention towards the life-course perspective, where the correlation between age and life-satisfaction is one dimension and the relationship between early life experiences and later life outcomes is another dimension. The literature within first dimension is proposing that there is a U-shaped relation for well-being over the lifespan with a minimum around middle age in most countries, see e.g. Blanchflower and Oswald (2004a, 2004b, 2008) and Steptoe et al. (2015), while literature within the second dimension is arguing that adult life-satisfaction is partly determined by adult economic and personal outcomes and partly by family background and childhood development, see e.g. Layard et al. (2014).

We combine these two stands by focusing on the age-profiles of life-satisfaction within municipalities with different degrees of urbanization in Denmark to explore inter-area variation in life-satisfaction, and, furthermore, to investigate if being a resident means a higher level and a less pronounced age-profile of life-satisfaction compared with being a newcomer to a municipality. The assumption is that residency status is a proxy for childhood experiences and, thereby, the knowledge and confidentiality about the social and physical environment surrounding one in adulthood.

Finally, we explore if movers are found to be more satisfied with their income – domain satisfaction – than stayers expecting that the driving mobility factor is to achieve better job and income conditions and, hence, improving one's life-satisfaction (Bowles, 1970; Yankow, 2003). To investigate this issue we not only use the general life-satisfaction question but also the question about income satisfaction or satisfaction with the financial situation, see Bonke & Browning (2009), which investigates the relationship between income satisfaction and intra-family income distribution.

Background

There are several studies that report a negative relationship between age and well-being and a positive relationship between age squared and well-being implying a u-shaped curve with higher levels of well-being at the younger and older age and the lowest well-being occurring in middle age (Gerdtham & Johannesson, 2001; Blanchflower & Oswald, 2004; Ferrer-i-Carbonell & Gowdy, 2007; Bauer et al., 2016). The relationship between age and well-being appears even after controlling for income, health, employment etc.

Also, income matters for satisfaction as found by e.g. Clark et al. (2008) and Bonke (2015) showing a positive but declining association expressed as diminishing returns to income. However, some of the positive association might be explained by reverse causality indicating that a high degree of wellbeing leads to higher future incomes (Diener et al., 2002; Graham et al., 2004). The expectation of a higher income in the future – within a five years period – is

associated with a higher actual life-satisfaction in general compared with people expecting the same income in the future, and the same holds for people receiving a higher income today than five years ago, also they are found more satisfied than people holding the same income over the last five-years period (Bonke, 2015).

Furthermore, the income of colleagues, friends and people with the same educational background matters for one's own life-satisfaction, the so-called per-group effect (Frey & Stutzer, 2002; Stutzer, 2004; Clark et al, 2008). However, only considerable differences in income to comparative peers, i.e. controlled for education, sex, civil status, age and health, is found to be positively correlated with life-satisfaction in Denmark – relatively higher income means more life-satisfaction – and only for men not for women (Bonke, 2015).

As stressed by Clark et al. (2008) the correlation between relative income and life-satisfaction depends on the size of the geographical area considered and only becomes negative if the reference group income is found among people spread over a wide area using data at an aggregated level, see Luttmer (2005) and Ferrer-i-Carbonell (2005). If the comparison group is close neighbors a positive correlation is found between their income and one's own satisfaction meaning that there is a preference for having rich neighbors for which people are ready to pay a premium to live in rich areas. The interpretation could be that not only relative income but also other aspects of local life matters for life-satisfaction (Clark et al., 2009).

From a recent analyses of well-being in Danish cities (OECD, 2016) based on the same data as here, we know that there are relatively smaller differences in people's well-being across Danish regions than observed in many other OECD-countries. We also know that the population growth has been stronger in the city cores of Danish cities than in their commuting zones during the last decade, and that the spatial segregation by income is stronger among the poorest households than among the richest households in Denmark. At the same time there has been a movement towards the bigger cities from the smaller ones and in particular from the countryside.

The movement of people towards the bigger cities in Denmark follows a historical and international trend of mobility, where the attractiveness of these cities concerning job opportunities etc. tends to be among the most important explanations. Hence, the decision to move is assumed to reveal people's current level of income and well-being and their expectations about their future opportunities and living conditions, or in other words, that people expect their well-being to increase relatively more in the place of destination compared to their place of origin (Faggian et al., 2012). If this means that the movers become as satisfied as the resident people at the new location, however, is an open-ended question to be investigated.

From this follows that the research questions addressed here are;

- how important are regional characteristics for the age-profile of life-satisfaction,
- does residency status impact the life-satisfaction differently over the age-stages and
- are movers more satisfied than people staying behind in their hometown.

Data

The data stem from Statistics Denmark's measurement of well-being project, which contains both data from administrative registers used for the production of regular statistics and survey data from a major survey on subjective life satisfaction measurements.

The basic idea of the project is to measure well-being at the municipal level using data from administrative registers for the measurement of *objective* life satisfaction combined with survey data on *subjective* life satisfaction. The fact that Statistics Denmark produce regular statistics in all areas of social statistics including income and labor market issues with data from administrative registers covering the entire population makes it possible in a very cost efficient way to get very detailed measurements of objective well-being indicators at the municipal level. One interesting thing about the municipal level in relation to well-being is that quite a few of the indicators is on areas where local politicians not only takes an interest in the well-being of the citizens – but they can also at least to some degree influence these areas through local political decisions.

The project contains objective well-being indicators at municipal level for all 98 municipalities in Denmark. It covers the period 2008 to 2015.

The OECD Guidelines guided the choice of the domains for measurement including Financial situation, Health, Safety, Education, Work, Social Relations, Housing and Participation in Society (e.g. participation in local and national elections) (OECD, 2013) and on top the overall measurement of subjective well-being in general *"All in all, how satisfied are you currently with your life? Please answer on a scale from 0 to 10 where 0 means "not satisfied at all" and 10 means "completely satisfied" "* (see <http://dst.dk/extranet/livskvalitet/livskvalitet.html>). The measurements of interest in this paper, are this measure of general satisfaction and the measure of economic satisfaction *"How satisfied are you with your economic situation? Please answer on a scale from 0 to 10 where 0 means "not satisfied at all" and 10 means "completely satisfied"*

The budget of the project allowed for a coverage of subjective indicators for four municipalities in the five administrative regions in Denmark, i.e. in total for 20 municipalities. The four municipalities were chosen as follows: The biggest in relation to population, the richest in relation to disposal income per inhabitant, the most average in demographic terms and the poorest in relation to disposal income per inhabitant.

In addition to the 20 municipalities, the region of Southern Denmark chose to go all in financing the data collection of the remaining 18 municipalities in that region.

This brings the overall coverage of municipalities with survey data on subjective well-being to 38 – out of the 98 municipalities in Denmark. In each of these 38 municipalities 1000 people above the age of 18 years participated in the survey. In addition to the surveys at municipal level on subjective well-being a survey with a national representative sample also on subjective well-being was conducted in order to have an overall national measurement of

subjective life satisfaction to be used among other things as a benchmark for the measurement in each of the 38 municipalities.

The survey data are linked to registry data using personal identification number in order to obtain information on attained level of education, attachment to the labor market, immigrant status, income, and place of residence. Residence can be determined down to the geographic coordinates of the building. Length of residency is defined as years lived in the same municipality. Degree of urbanization is defined on a municipal level, based on the EUROSTAT degree of urbanization but with intermediate- and low-density areas subdivided by the size of the largest city in the area.

Restriction to the focus municipalities excludes 2123 observations, leaving 40465. We then exclude observations for which address coordinates could not be found ($n=71$) and observations with missing information on outcome ($n=93$).

Methods

Analyses were performed using R version 3.2.3. Linear regression models were fit by OLS with general life satisfaction as outcome and age, sex, education, attachment to the labor market, immigrant status and income as independent variables. Income was modeled using b-splines, the remaining variables were treated as categorical. When plotting the average marginal effects of age (separately and by region, length of residency and degree of urbanization), age was modeled with b-splines. Missing values of the independent variables were single imputed with the mode of the variable (Hastie & Tibshirani, 1990).

We plot smoothed estimates of the average local satisfaction level by place of residence, constructing a map of the focus municipalities divided into 1 km² cells, and assigning each cell the average satisfaction of the 100 respondents nearest to its center.

Because the data used are cross-sectional the different relationships are not necessarily causal and for that reason policy recommendations are to be drawn with caution.

Descriptives

The data include variables from Statistics Denmark's administrative registers, which have information about Danish citizens on a personal level from the beginning of the 1980s up to now.

Residency status is defined based on number of years lived in the same municipality. Data on municipality of residence was available from 1981 and onwards. Municipality of birth was available for all subjects born in Denmark. Thus, a meaningful cut-off applicable to all subjects is having lived in the same municipality for 15+ years. Of course, the interpretation of residence length must differ by age, as the life stage in which a move to a new community is undertaken must affect the effect on life satisfaction. If we want to explore the effect of age at

moving, we must restrict to the sub-population for which we have long enough follow-up. The age intervals of interest are 0-5 years (pre-school), 6-15 years (school age), 16-24 years (education) and 25+, so we run analyses in the sub-populations aged 25-41, 35-51 and 25-60.

Degree of urbanization is defined on a municipal level following EUROSTAT classification with these categories: Densely populated areas, Intermediate density areas, and thinly populated areas.

Income refers to equalized household net income (after tax), education follows ISCED-15 classification, and Social Status the SOC_STATUS_CODE at Statistics Denmark.

Table 1. Descriptive statistics – variables including satisfaction scores

	n	%	Mean General satisfaction (0-10)
Age			
18 - 27	4141	10.3	7.6
28 - 37	4247	10.5	7.5
38 - 47	6392	15.9	7.5
48 - 57	8110	20.1	7.5
58 - 67	7962	19.8	7.9
68 - 77	6621	16.4	8.1
78 - 87	2427	6	7.9
88 +	401	1	7.8
Sex			
Male	19498	48.4	7.7
Female	20803	51.6	7.7
Education			
Vocational edution and training	15062	37.4	7.8
Secondary education or less	12881	32	7.6
Higher education	11271	28	7.7
No information	1087	2.7	7.3
Immigrant status			
Native born	37563	93.2	7.7
Immigrant	2486	6.2	7.4
Descendant	247	0.6	7.6
No information	5	0	7
Socioeconomic status			
Employees, basic level	7408	18.4	7.7
Self-employed	1556	3.9	7.8
Top managers	975	2.4	8

Employees - upper level	3536	8.8	7.8
Employees - medium level	4460	11.1	7.7
Other employees	1558	3.9	7.7
Employees, not specified	2421	6	7.7
Unemployed	394	1	6.7
Unemployment benefit etc.	355	0.9	6.5
Students	2772	6.9	7.5
Disability pension	1719	4.3	6.9
Oldage pensioners	9904	24.6	8.1
Early retirement pay	1459	3.6	8
Recipients of cash benefits	942	2.3	6.2
Others	771	1.9	7.2
No information	71	0.2	6.4
Income			
Lowest quartile	9956	24.7	7.4
	9966	24.7	7.7
	9967	24.7	7.8
Highest quartile	9962	24.7	7.9
No information	450	1.1	7.2
Length of residency			
<4 years	4867	12.1	7.5
5-9 years	4055	10.1	7.5
10-15 years	3610	9	7.5
15+ years	27524	68.3	7.8
No information	245	0.6	7.8
Urbanization			
Densely populated area	5603	13.9	7.6
Intermediate density area	13006	32.3	7.7
Thinly populated area	21692	53.8	7.7

Table 2. Descriptive statistics – variables by length of residency

	<u><5 years</u>		<u>5-9 years</u>		<u>10-15 years</u>		<u>15+ years</u>	
(p-value)	N	%	N	%	N	%	N	%
Sex 0.06								
Male	2343	48.1	1884	46.5	1746	48.4	13397	48.7
Female	2524	51.9	2171	53.5	1864	51.6	14127	51.3
Age (<0.0001)								
18 - 27	1554	31.9	359	8.9	187	5.2	2030	7.4
28 - 37	1303	26.8	1201	29.6	614	17	1114	4
38 - 47	700	14.4	1039	25.6	1212	33.6	3405	12.4
48 - 57	578	11.9	581	14.3	673	18.6	6235	22.7
58 - 67	441	9.1	458	11.3	453	12.5	6551	23.8
68 - 77	233	4.8	347	8.6	378	10.5	5608	20.4
78 - 87	46	0.9	58	1.4	82	2.3	2220	8.1
88 +	12	0.2	12	0.3	11	0.3	361	1.3
Education (<0.0001)								
Vocational education and training	1229	25.3	1302	32.1	1223	33.9	11225	40.8
Secondary education or less	1646	33.8	926	22.8	886	24.5	9337	33.9
Higher education	1434	29.5	1592	39.3	1452	40.2	6732	24.5
NA	558	11.5	235	5.8	49	1.4	230	0.8
Region (<0.0001)								
North Jylland	475	9.8	387	9.5	360	10	2969	10.8
Central Jylland	555	11.4	444	10.9	377	10.4	2838	10.3
South Denmark	2542	52.2	2284	56.3	1945	53.9	16392	59.6
The Capital region	797	16.4	533	13.1	467	12.9	2540	9.2
Sjaelland	498	10.2	407	10	461	12.8	2785	10.1
Degree of urbanization (<0.0001)								
Densely populated area	1104	22.7	695	17.1	521	14.4	3255	11.8
Intermediate density area	1563	32.1	1237	30.5	1202	33.3	8939	32.5
Thinly populated area	2200	45.2	2123	52.4	1887	52.3	15330	55.7

Figure 1. Distribution of the general satisfaction variable

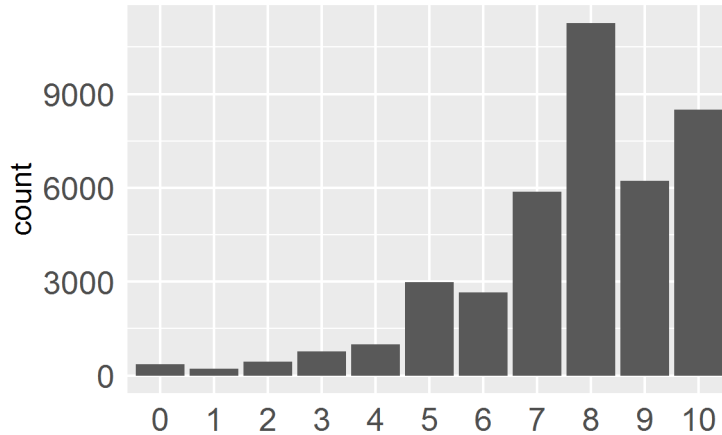
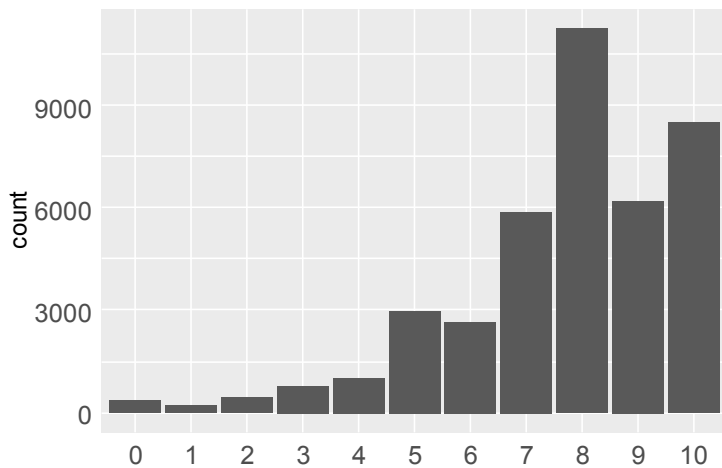


Figure 2. Distribution of the income satisfaction variable



Note: The number of missing values is 71

The variables for general satisfaction and income-satisfaction were measured on a scale from 0 to 10. The mean general satisfaction was 7.7 with inter-quartile range 7-9, whereas the mean income-satisfaction was 7.2, inter-quartile range 6-9. The correlation between the two satisfaction measures was 0.44.

Geography and life-satisfaction

Based on the same data as here an analysis of well-being in Danish cities (OECD, 2016) shows that there are relatively smaller differences in people's well-being across Danish regions than observed in many other OECD-countries. The analysis also shows that the population growth has been stronger in the city cores of Danish cities than in their commuting zones during the

last decade, and that the spatial segregation by income is substantial within municipalities in Denmark. This means that considerable variation in satisfaction between local areas is likely to exist within municipalities. Furthermore, patterns of movement may depend more strongly on local satisfaction than the municipal average.

Figures 3 and 4. Geographic distribution of the respondents – numbers in each map grid cell, and geographic distribution of the proportion of respondents resident for less than 15 years

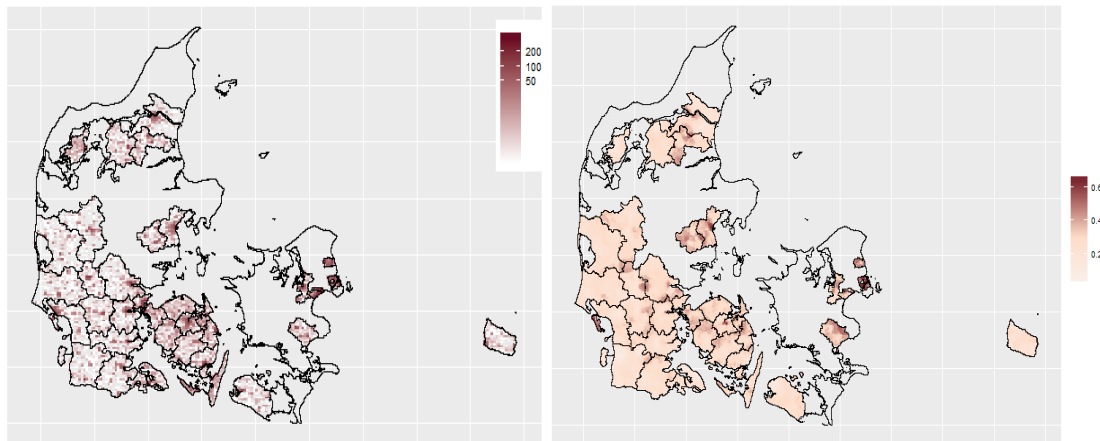
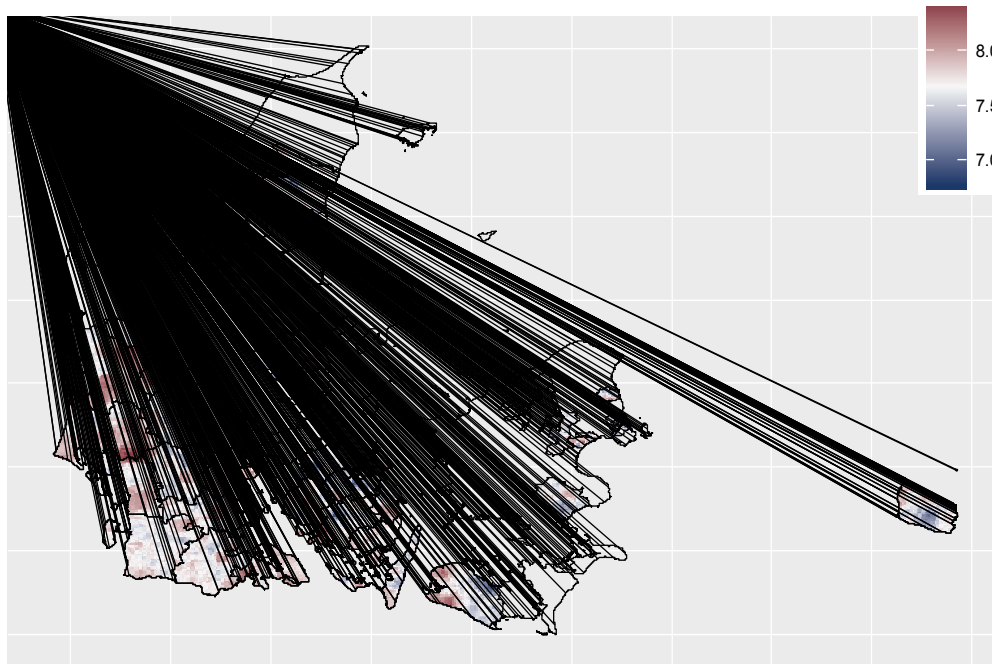


Figure 3 - the map on the left - shows the geographical distribution of respondents, and as expected, the density of respondents reflects the density of the population. Figure 4 - the map on the right - displays the proportion of respondents that have lived in the municipality for less than 15 years, i.e. movers. This proportion is high in the urban centers and low in the countryside, which indicates that people move to job-intensive, urbanized areas.

Figure 5. Geographic variation –Local satisfaction



From figure 5, we see that average local satisfaction varies considerably within municipalities with a general tendency towards highly urbanized areas characterized by low general satisfaction, whereas many rural areas have high satisfaction, which may reflect differences in the age profiles and/or other sociodemographic characteristics between the areas.

Analyses

Analyses were performed using linear regression models with general life satisfaction as outcome and age, sex, education, attachment to the labor market, immigrant status and income as independent variables. Income and age were modeled using b-splines, the remaining variables were treated as categorical. As income and age are modeled using splines, these estimates are not very informative and they are shown graphically.

We find that most regressors have a relatively weak association with self-reported general satisfaction (Table 3). Nonetheless, when compared to densely populated (urban) areas, residents of thinly populated areas have a significantly higher score (estimates of 0.11, standard errors of 0.03). Concerning residency, there is no difference within the group resident in a municipality for less than 15 years, but the group resident for 15+ years has a significantly higher score than those residents living at the same community for less than five years.

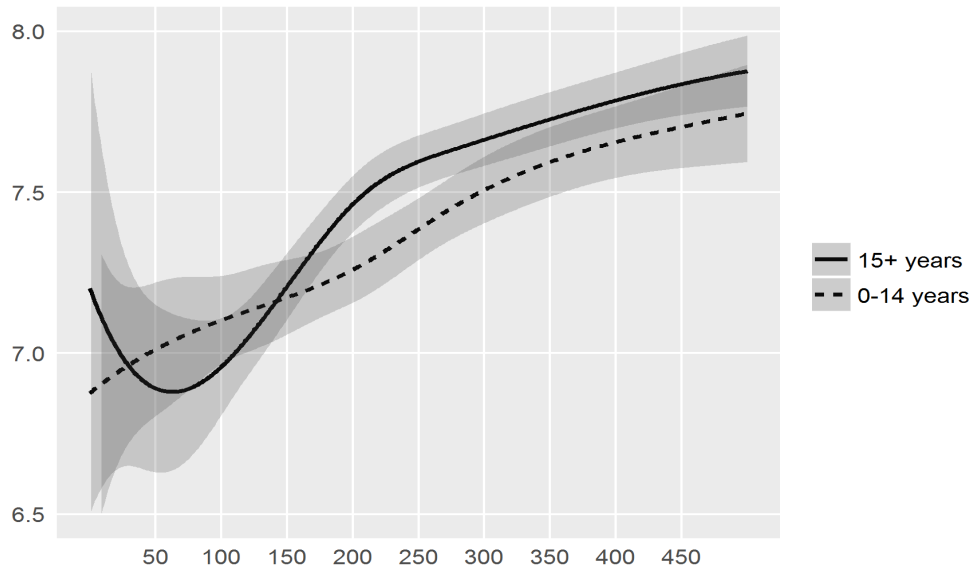
Table 3: General satisfaction estimated from a model treating income and age as continuous variables modeled with splines and all other variables as categorical.

		Estimate	Std. error	t-value	p-value
Sex					
	Male	0 (REF)			
	Female	0.04	0.02	1.75	0.08
Education					
	Vocational training	0 (REF)			
	High school or less	-0.07	0.03	-2.58	0.01
	Further education	-0.1	0.03	-3.56	0
Length of residency					
	<5 years	0 (REF)			
	5-9 years	-0.01	0.04	-0.25	0.8
	10-14 years	-0.03	0.05	-0.73	0.46
	15+ years	0.12	0.03	3.41	0
Degree of urbanization					
	Densely populated	0 (REF)			
	Intermediate density	0.05	0.03	1.64	0.1
	Thinly populated	0.11	0.03	3.66	0

Note: The model includes age, income, labour market attachment and immigrant status.

Figure 6 shows the relationship between income and general satisfaction for people living in the same municipality for 15+ years and people living shorter than that time in the municipality. For both curves the satisfaction increases with income, however, for “stayers” more markedly for the interval from ca. 120000 to 220,000 DKK and less so from 220,000 DKK and upwards. For incomes between 220,000 and 300,000 DKK stayers are more economically satisfied than movers while there is no significant difference for higher incomes. This demonstrates that the increase in financial satisfaction grows smaller with increases in equalized household net income for both groups indicating “decreasing marginal utility of money”, see Bonke (2015) for the same finding using another Danish dataset and Layard et al. (2008) making an international comparison on different datasets. Bonke (ibid) also shows that people receiving a higher income today than five years ago are found more satisfied than people holding the same income over the last five years period.

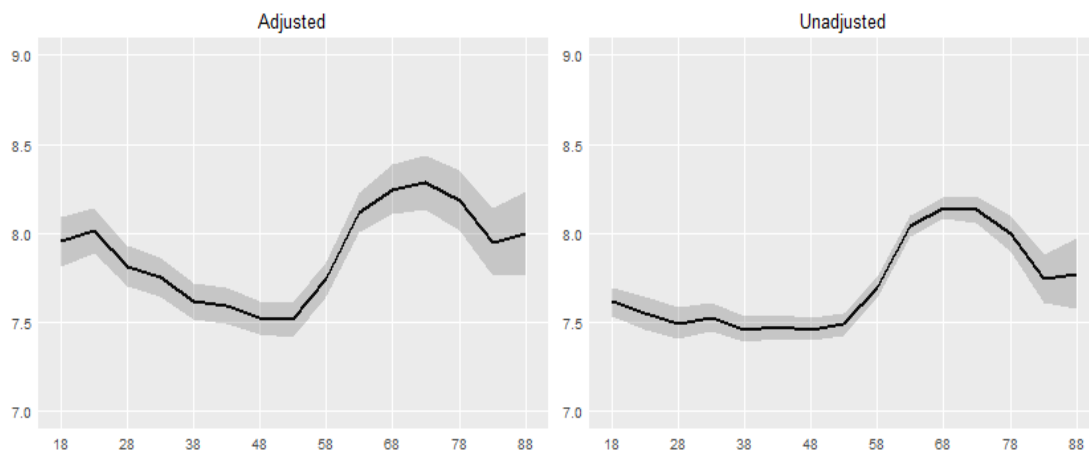
Figure 6. General satisfaction by income in 1000 DKK and length of residency. Adjusted for age, sex, education, labor market attachment, immigrant and residency status and degree of urbanization



p-value for significance test of interaction: 0.001

In accordance to other studies, e.g. Blanchflower & Oswald (2004), Ferrer-i-Carbonell & Gowdy (2007) and Bauer et al. (2016), we observe an S-shaped relation between age and satisfaction, with satisfaction decreasing slightly until the mid-fifties, increasing rather sharply after this and starting to decrease again after age 70. This holds and become even more marked when adjusted for sex, education, attachment to the labor market, immigrant status, resident status and income (Figure 7).

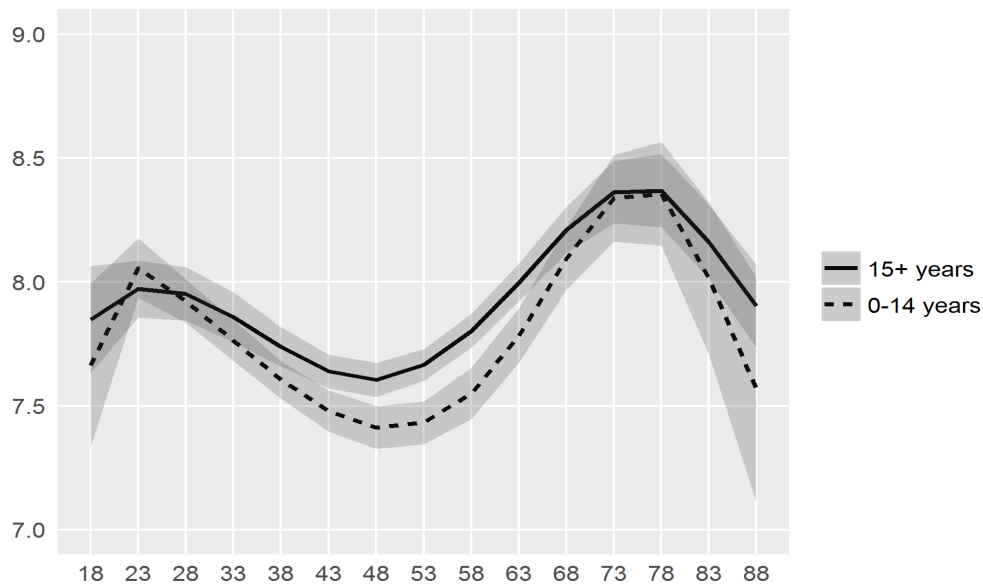
Figure 7. General satisfaction by age + 95% cf-interval, adjusted* and unadjusted



*: Adjusted for sex, education, attachment to the labor market, immigrant status, resident status and income.

In Figure A1 in appendix we see that the relationship between age and general satisfaction follows the same S-shape for the different regions in Denmark and in particular for the middle-aged there is no difference between the curves. Concerning urbanization, a test for difference in the age profiles between residents in densely and thinly populated areas, see Figure A2 in appendix, is positive and significant with a p-value of 0.0008. We saw no difference in the age profiles for urbanization overall.

Figure 8. General satisfaction by age and length of residency, adjusted for sex, education, attachment to the labor market, immigrant status and income, age modeled with splines.

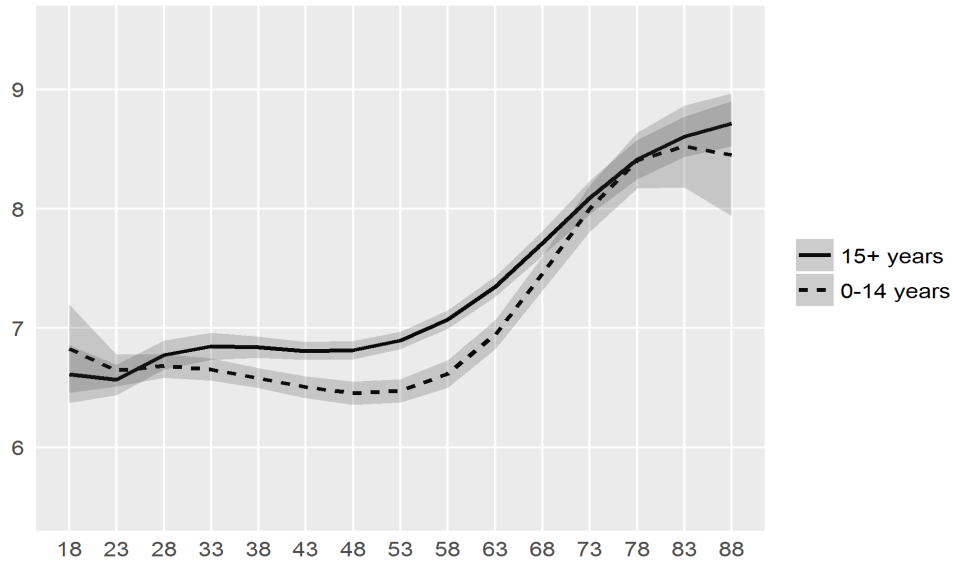


p-value for significance test of interaction: 0.009

The difference in general satisfaction by length of residency in the same municipality seems to be driven by the effect among the middle-aged. Hence, residents having stayed in the same municipality for 15+ years are found more satisfied than residents living in the same municipality for less than 15 years (Figure 8). The same finding appears for economic satisfaction, where having stayed in the same municipality for 15+ years are also found more satisfied than residents living in the same municipality for less than 15 years (Figure 9).

Figure 9. Economic satisfaction score by age and residency status, adjusted for sex, education, immigrant status, labor market attachment, length of residency, degree of

urbanization and income



p-value for significance test of interaction <0.0001

General satisfaction relative to local average

We predict the average local satisfaction as shown in figure 3 for each subject in the study, and compute the difference between the predicted and observed satisfaction. When modeling this score, we see that those resident for <15 years have a lower score than those resident 15+ years (linear model estimate -0.12 (95% CI -0.17, -0.07)). For comparison, the effect of length of residency on observed satisfaction is -0.13 (95% CI -0.18, -0.8).

We would expect those who change municipality to move to a place with relatively high local satisfaction. However, the average local satisfaction among those resident 15+ years is 7.8 (IQR 7-9) whereas the average among those resident less than 15 years is 7.5 (IQR 7-9).

In a model adjusting for income, education, labor market attachment, immigrant status, sex and age, when comparing people who live in the same municipality, those moved there within the last year are marginally less satisfied (linear model estimate -0.16 (95% CI -0.3, -0.02)). However, when comparing people who have left a municipality within a year to those still living there, there is no effect on general satisfaction (linear model estimate 0.01 (95% CI -0.16, 0.18)). Neither model has significant interaction of mover status with age, indicating that the association between moving and satisfaction does not differ according to age.

Life stage at moving to a municipality

The importance of the length of residency in a certain municipality may be very different depending on when the movement took place. Residing in a municipality through a certain

stage of life where the opportunities to form social networks are plentiful, may be more important than simply residing in a municipality for a long period of time. To explore this, we compared individuals who had either resided in the same municipality since birth or had moved to the municipality in one of four stages of life: 1) Before the age of six, which is the age at which most children in Denmark enters primary school 2) before the age of 16, where most children complete primary school, 3) before the age of 25, when many will have completed education, and 4) after the age of 25 year. Information on municipality of birth is available for all persons born in Denmark, but the availability of information on residence throughout life depends on birth cohort, which is reflected in the table below.

Table 4. General satisfaction and age at moving to current residence.

	Age 25-41		Age 25-51		Age 25-60	
	N	Estimate (95% CI)	N	Estimate (95% CI)	N	Estimate (95% CI)
Age at move to current municipality						
Born there	865	REF	1153	REF	1199	REF
0-5	596	0.15 (-0.05, 0.35)	1943	0.03 (-0.11, 0.17)	8375	-0.04 (-0.16, 0.08)
6-15	338	-0.02 (-0.26, 0.22)				
16-24	2113	-0.09 (-0.24, 0.06)	3915	-0.03 (-0.16, 0.10)		
25+	3714	-0.08 (-0.23, 0.07)	7911	-0.16 (-0.29, -0.04)	12488	-0.19 (-0.31, -0.07)

Table 4 shows that there are not any substantial differences in satisfaction according to the age at moving to the current municipality of residence, and in the population aged 25-41 there seems to be no difference at all. However, when including the elderly, those moved after age 25+ seem to be significantly less satisfied than those still living in their municipality of birth. This may be explained by the earlier result that satisfaction increases with years lived in the same municipality – the higher we set the upper age window, the more “having lived in a municipality since a young age” becomes synonymous with “having lived in a municipality for a long time”.

It must be noted that the estimates in table 4 are not directly comparable, as the study populations are nested but not identical.

Summary

The paper focuses on the age-profiles of life-satisfaction within municipalities with different degrees of urbanization in Denmark and explores inter-area variation in life-satisfaction, and

investigates if being a resident means a higher level and a less pronounced age-profile of life-satisfaction compared with being a newcomer to a municipality. The paper also investigates if movers are more satisfied with their income than stayers expecting that the driving mobility factor is to achieve better job and income conditions and, hence, improving one's life-satisfaction.

The data are from Statistics Denmark's measurement of well-being project, which contains both data from administrative registers used for the production of regular statistics and survey data from a major survey on subjective life satisfaction measurements. Hence, the basic idea of the project is to measure well-being at the municipal level using data from administrative registers for the measurement of *objective* life satisfaction combined with survey data on *subjective* life satisfaction.

We find that average local satisfaction varies considerably within municipalities with a general tendency towards of highly urbanized areas characterized by low general satisfaction, whereas many rural areas have high satisfaction. However, there is found no difference within the group resident in a municipality for less than 15 years, but the group resident for 15+ years has a significantly higher score than those residents living at the same community for less than five years. In accordance to other studies, we observe an S-shaped relation between age and satisfaction, with satisfaction decreasing slightly until the mid-fifties, increasing rather sharply after this and starting to decrease again after age 70. Further, the relationship between age and general satisfaction follows the same S-shape for the different regions in Denmark.

There is found no substantial differences in satisfaction according to the age at moving to the current municipality of residence, and in the population aged 25-41 there seems to be no difference at all. However, when including the elderly, those moved after age 25+ seem to be significantly less satisfied than those still living in their municipality of birth.

Because the data are cross-sectional the different relationships are not necessarily causal and for that reason policy recommendations are to be drawn with caution. This does not imply, however, that the regional aspect and the question about residency raised here are of no importance for policy makers.

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Appendices

Table A1 – characteristics of the focus municipalities

	Respondents	Residents per Jan 1st 2015	Area (km²)	Degree of urbanization	Mean general satisfaction
Region Nordjylland					
Morsø	1024	20,707	366	3	7.8
Rebild	1072	29,290	621	3	7.8
Vesthimmerlands	1073	37,282	770	3	7.8
Aalborg	1062	210,276	1137	2	7.6
Region Midtjylland					
Herning	1031	88,118	1321	3	7.7
Ringkøbing-Skjern	1077	57,060	1470	3	8
Skanderborg	1056	59,983	417	2	7.7
Aarhus	1074	331,505	468	1	7.6
Region Syddanmark					
Assens	1066	41,413	512	3	7.8
Billund	1077	26,562	540	2	7.7
Esbjerg	1150	115,987	795	2	7.8
Fanø	608	3,337	55	3	7.8
Fredericia	1038	50,844	134	2	7.6
Faaborg-Midtfyn	1045	51,329	634	2	7.7
Haderslev	1070	56,082	817	2	7.7
Kerteminde	1096	23,834	206	3	7.7
Kolding	1171	91,745	604	2	7.7
Langeland	1034	12,592	289	3	7.7
Middelfart	1049	38,041	299	3	7.7
Nordfyns	1051	29,374	452	3	7.6
Nyborg	1061	32,036	277	2	7.7
Odense	1310	199,235	306	1	7.6
Svendborg	1093	58,393	417	2	7.7
Sønderborg	1042	74,804	415	2	7.9
Tønder	1076	37,981	497	3	7.7
Varde	1071	50,449	1284	3	7.9
Vejen	1067	42,945	1240	3	7.7
Vejle	1175	112,494	1058	3	7.7
Ærø	909	6,231	90	3	7.7
Aabenraa	1036	59,077	941	3	7.8

Region Hovedstaden					
Bornholm	1076	39,740	588	3	7.7
Ishøj	987	22,536	26	1	7.7
København	1212	594,535	86	1	7.5
Rudersdal	1088	55,915	73	2	7.7
Region Sjælland					
Faxe	1034	35,734	405	3	7.6
Greve	1020	49,717	60	1	7.7
Lolland	1022	42,528	886	3	7.7
Roskilde	1098	86,657	212	2	7.6

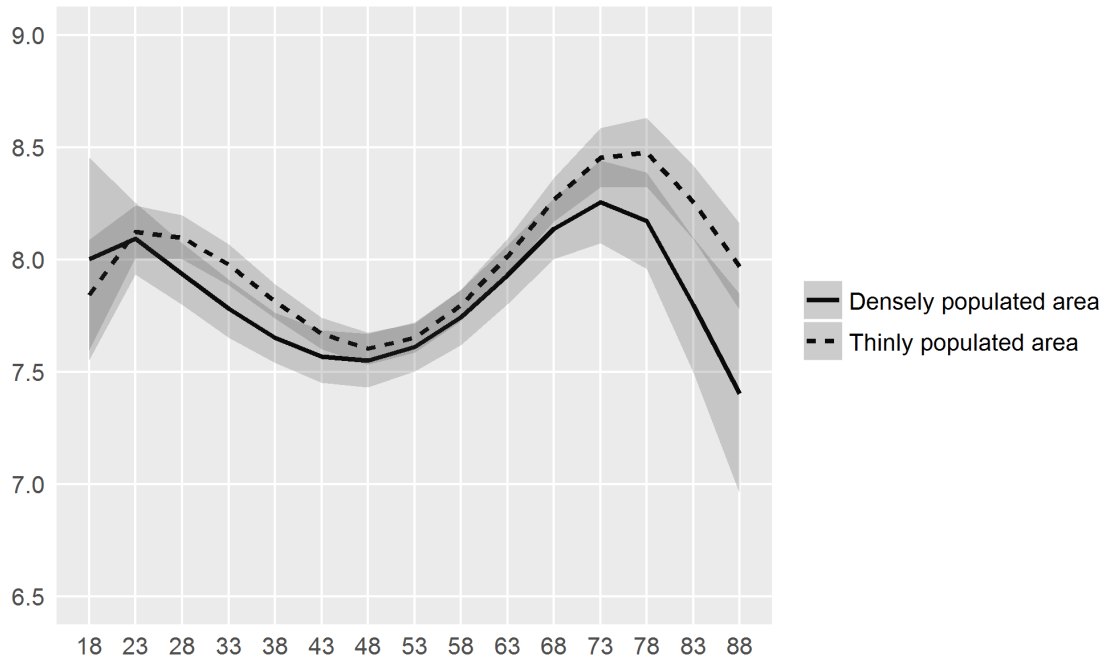
Degree of urbanization: 1 = Densely populated area, 2 = Intermediate density area, 3 = Thinly populated area

Figure A1. General satisfaction by age and region, adjusted for sex, education, attachment to the labor market, immigrant status, resident status and income, age modeled with splines



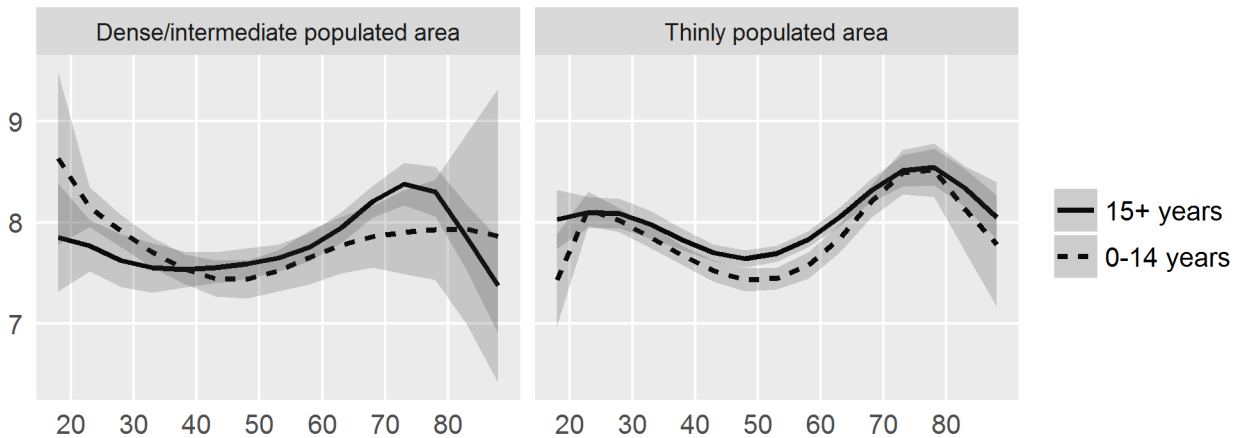
p-value for significance test of interaction: 0.052

Figure A2. General satisfaction by age and degree of urbanization, adjusted for sex, education, attachment to the labor market, immigrant status, resident status and income, age modeled with splines



P-value for significance test of interaction: 0.18

Figure A3. General satisfaction by age, resident status and degree of urbanization, adjusted for sex, education, attachment to the labor market, immigrant status, resident status and income, age modeled with splines



P-value for significance test of interaction (difference between the four age-profiles in general satisfaction): 0.003