

Growing Cities are Happier than Shrinking Cities

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This is only second study on the topic after Delken (2008), such gap in the literature is remarkable. A remarkable result is the strength of the relationship –SWB correlates higher with population change than with county level crime and income—and the stronger effect sizes hold in regressions controlling for person level and county level predictors of SWB. Yet, the absolute effect of population change, as those of other ecological vars, is small— 10 percent increase in population change leads to little additional happiness, about .01 or .02 increase on 1-4 SWB scale.

SUBJECTIVE WELLBEING, LIFE SATISFACTION, HAPPINESS, BEHAVIORAL RISK FACTOR SURVEILLANCE SYSTEM (BRFSS), POPULATION CHANGE, SHRINKAGE

Urbanization is rampant: according to UN, urban population exploded from 30% in 1950 to 50% in 2005, and is projected to grow to 70% in 2050. Yet, many cities shrink. There is much research on the effect of size of place on SWB as recently summarized by Okulicz-Kozaryn and Valente (2021). But we know very little about the effect of change in size of a place on SWB. Hence, the present study.

The US is a land of inequalities, not just in widely discussed income, but also in population growth and shrinkage.

Take for instance two counties that an author of this study inhabited. Collin TX is a northern suburb of Dallas— it mushroomed sevenfold just over 4 decades, from 150k in 1980 to 1m in 2019. Or take my current county, Camden NJ, which over the same period stayed flat, while the county seat, city of Camden shrank about 40% from its height of 125k in 1950 to 72k in 2020. Collin TX and Camden NJ tell a story representative of many other counties in South v North East.

Sunny, spacious, and affordable South aka “Sunbelt” often mushrooms at mind boggling pace, and gritty, crowded, and expensive North East aka “Rustbelt” stays flat or shrinks.¹

Again, there is much research on population size and SWB as recently summarized in Okulicz-Kozaryn and Valente (2021), but there is very little research on population change and SWB. Google Scholar queries such as “population change and happiness,” “city growth and happiness,” “population growth and happiness,” “population decline and happiness” do not yield relevant literature. If anything, there is a sizeable literature on shrinking city and very little of it somewhat relates to quality of life (but not happiness) (the terms are defined for instance in Okulicz-Kozaryn and Valente 2019).

The only study on population change and SWB is a master thesis written under the direction of a “happiness grandfather,” Ruut Veenhoven (Delken 2008). The thesis offers a conclusion: “Overall satisfaction with life appears not to be lower in shrinking cities and satisfaction with several domains of life even higher. This is not because inhabitants are unaware of the situation of their city, since they appear to be more concerned about job-chances and crime.” We agree that job-chances and crime are critical for happiness, possibly the most important ecological variables when it comes to place growth or shrinkage. But our study finds that shrinkage is related to lower SWB (controlling for crime and employment).

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I thank XXX. All mistakes are mine.

¹Many counties in the US shrink, and are desperate to regain population, even offering \$15,000 to move in (Block 2021). Largest American cities are not growing or even shrinking recently (THOMPSON 2019).

Delken (2008) assumes three scenarios for cities: *growing* $\geq 3\%$, $-3\% < \textit{stable} > 3\%$, $3\% < \textit{shrinking}$. An advantage of Delken (2008) over our study is domain satisfactions—we only have global life satisfaction. An advantage of our study is structural: Delken (2008) uses German data—our study uses US data—US is more dynamic in terms of population than Germany.

Hartt (2019) makes a similar point to Delken (2008)—people can live happily in shrinking cities, but Hartt (2019) does not use SWB measure and uses other proxies instead. Per shrinking cities Hollander is perhaps the most prolific scholar in this area—Hollander (2011) argues similarly: cities can shrink successfully, enjoy “smart decline”: shrinkage does not always mean decline in quality of life.

The bottomline is that there is some related research to the population growth-SWB nexus, but only one study, Delken (2008), uses SWB measure.

One other study uses SWB measure—similarly to our study, Glaeser et al. (2016) uses BRFSS data and finds positive effect of population growth on SWB. There are, however, critical problems with Glaeser et al. (2016): Glaeser et al. (2016) cherry-picks only certain urban areas and drops from the data smaller counties without any good reason. Dropping cases from sample may lead to finding results that one wants to find.² In addition, the analyses are oversaturated with many controls. Specifically, by adding state fixed effects, which correlate with population size and change, the relationship flips from negative to positive on urbanicity. Modeling in Glaeser et al. (2016) appears to be flawed, and hence Delken (2008) is considered the only useful study in this area.

Several other studies are somewhat related to the present study, but fundamentally their approaches are disjoint, and hence, not relevant to the present study. Goetzke and Islam (2017) and Barreira et al. (2019) argue that unhappiness predicts population decline or happiness predicts population growth. We believe that population changes are mostly due to other factors than happiness, and it is rather decline or growth that leads to unhappiness or happiness, not the other way round.

Park et al. (2021) offers a novel approach using Twitter data, but the research is conducted in one city only. We note that data from social media holds much promise for the future research.

Finally, Chen et al. (2019) finds that shrinking or as they term “hollowing” rural areas are not less happy, however, —it’s disjoint from present research—study uses Chinese data—China has unique population change and migration patterns.

1 Theory

None of the 5 major happiness theories help to explain much why population growth or decline would change SWB:

- genes/set point (eg Schnittker 2008)
- adaptation/adjustment; hedonic treadmill (Brickman et al. 1978)
- needs/livability (Veenhoven and Ehrhardt 1995)
- comparison/discrepancies (Michalos 1985)
- happiness just a motivator (Carver and Scheier 1990) (rather momentary affective happiness than global cognitive life satisfaction)

But we find another theory that may explain the mechanism well. It may be signballing, visually explained with so called “tunnel effect”—humans think that whatever happens to others, whether things get better or worse, will eventually happen to them as well. Hence, if a place grows, there are positive connotations; if it shrinks, it’s negative. This is so-called “tunnel effect”:

Suppose that I drive through a two-lane tunnel, both lanes going in the same direction, and run into a serious traffic jam.

No car moves in either lane as far as I can see (which is not very far). I am in the left lane and feel dejected. After a while the cars in the right lane begin to move. Naturally my spirits lift considerably, for I know the jam has been broken and

²Notably, there seem to be a pattern—for instance Glaeser (2011) drops from the sample developed countries so that much of it contains African countries to make a case that urban places are happier, while in fact they are not with exception of very poor countries such as those in Africa.

that my lane's turn to move will surely come at any moment now. Even though I still sit still, I feel much better off than before because of the expectation that I shall soon be on the move. (Hirschman, quoted in Ravallion and Lokshin 2000, p. 88)

In a sense, tunnel effect is related to MDT—if by comparison the area is doing well (growing as opposed to shrinking), then a person is happier. Although there can also be negative effects of others doing better, “Schadenfreude”, e.g., neighbors as negatives (Luttmer 2005), being together with those doing well v others doing not so well Firebaugh and Schroeder (2009). Population growth/decline seems to be related to opportunities/jobs safety/crime, at least prospects or perceptions of those.

2 Data and Method

All person level data come from the 2005-2010 Behavioral Risk Factor Surveillance System (BRFSS) data cdc.gov/brfss. We use the SMART (Selected Metropolitan/Micropolitan Area Risk Trends) version of BRFSS that is representative of counties.

All county level data come from the Inter-university Consortium for Political and Social Research: County Characteristics, 2000-2007. doi:10.3886/ICPSR20660.v2. As most county level control variables are for 2000-2005, regression analyses use 2005 BRFSS only, and descriptive statistics at county level only use full 2005-2010 BRFSS collapsed by county.³

While we only have 392 counties in 2005-2010 BRFSS, 13% of about 3,000 US counties, there is a good representation across the country including the largest coastal cities, smaller cities, suburbs, exurbs, and rural counties.⁴

The SWB item reads “In general, how satisfied are you with your life?” For simplicity answers were recoded so that a higher numeric value means more happiness: 1 “very dissatisfied” 2 “dissatisfied” 3 “satisfied” 4 “very satisfied”—over 90 percent of respondents were either satisfied or very satisfied with their lives. All other variables are defined in table 1. We follow Okulicz-Kozaryn and Mazelis (2016) in terms of controls.

³In addition for the supplementary analyses and robustness checks we use census data for 90-00 and 00-10 pop gro

⁴All 51 states are in the data, but most have fewer than 10 counties represented here, and several only one or two counties. Small NJ has almost all of its 21 counties represented. And by far most counties in this dataset are from FL, over 40.

Table 1: Variable definitions.

name				description			
person-level variables:							
income				"Is your annual household income from all sources:"			
married or member of an un-married couple				"marital status; Are you:"			
unemployed				"Are you currently: Out of work"			
age				age			
White				White			
education level				"What is the highest grade or year of school you completed?"			
soc/emo support				"How often do you get the social and emotional support you need? " BRFSS			
county-level variables:							
crime rate index				"Index crime rate (per 100,000 persons), 2004"			
persistent poverty				"20 percent or more of residents were poor as measured by each of the last 4 censuses, 1970, 1980, 1990, and 2000"			
% Black				"percent Black, 2005"			
low education				"25 percent or more of residents 25-64 years old had neither a high school diploma nor GED in 2000."			
housing stress				"30 percent or more of households had one or more of these housing conditions in 2000: lacked complete plumbing, lacked complete kitchen, paid 30 percent or more of income for owner costs or rent, or had more than 1 person per room."			
low employment				"Less than 65 percent of residents 21-64 years old were employed in 2000."			
population loss				"Number of residents declined both between the 1980 and 1990 censuses and between the 1990 and 2000 censuses."			
pers. inc. (USD 1,000)/cap				"per capita personal income (USD 1,000), 2005"			
population	percent	change		from county characteristics ICPSR file			
population 2000-2005							
population 2000-2010	percent	change		popGro00	10=100*((census2010pop-pop00)/pop00);	var	census2010pop
				from	https://www2.census.gov/programs-surveys/popest/datasets/2000-2010/intercensal/county/co-est00int-tot.csv		
population 1990-2000	percent	change		popGro90	00=100*((pop00-apr1 1990Pop)/apr1 1990Pop);	var	apr1 1990Pop
				from	https://www2.census.gov/programs-surveys/popest/datasets/1980-1990/counties/totals/comp8090.zip		
population				"census 2000 total resident population"			

Notable controls include person level `unemployed` and county level `low employment` and `crime rate index`—these variables not only predict SWB but also correlate with population change.

We use a standard OLS regression with clustered standard errors on county with BRFSS sampling weights to account for over-sampling. We treat the 4-step happiness variable as continuous. Ordinal happiness can be treated as a continuous variable (Ferrer-i Carbonell and Frijters 2004).⁵

3 Results

First we provide broad descriptive statistics at county level using county level data and means of person BRFSS level variables collapsed over 2005-2010 to county level.

Over just 5 years from 2000 to 2005 several counties shrank by about 5% and several grew by about 10%.⁶

Table 2 shows correlations. Among ecological (county-level) variables, remarkably, SWB's very strongest correlation is with population growth, even much stronger (more than 50%) than crime or (about 100%) income! This is the key, and unexpected finding of

⁵We used the following Stata command: `regress <happiness> <person-level variables> <county-level variables> [pw=_cntywt] , robust cluster(<county>)`.

⁶Full county-level and auxiliary descriptive statistics (not shown here) are https://colab.research.google.com/drive/1fFzDc73LbGAC-G6_I58FV1fH691NAs7_?usp=sharingonline. Over 10 years 1990-2000 or 2000-2010 several counties shrank by >30% and several grew by >50%.

this research. While some correaltions of these signs were expected, such extremely large magnitudes were unexpected.⁷

Table 2: Cross-correlation table. All correlations bigger than .1 are also statistically significant at .05.

Variables	populatio percent change 2000- 2005	crime rate index	% Black	housing stress	low employ- ment	populatio loss	pers. inc. (USD 1,000)/cap	swb
population percent change 2000-2005	1.00							
crime rate index	-0.17	1.00						
% Black	-0.21	0.48	1.00					
housing stress	0.04	0.20	0.10	1.00				
low employment	0.09	0.04	0.03	0.18	1.00			
population loss	-0.27	0.18	0.27	-0.01	0.05	1.00		
pers. inc. (USD 1,000)/cap	-0.18	-0.17	0.00	0.05	-0.27	-0.04	1.00	
swb	0.39	-0.25	-0.24	-0.13	-0.18	-0.29	0.22	1.00

Nb. obs. : 376

While correlation between population change and SWB is remarkably high, the absolute differences on SWB are small. SWB ranges only between 3.2-3.6 on 1-4 person level scale asked to respondents. The scatterplot between population change and SWB is shown in figure ???. There are curiously consistent geographic patterns circled in the graph, for instance large North-Eastern cities cluster at bottom-left, Southern counties cluster at top-right, and three happiest counties in this sample are either in West or North.

Figure 2 shows thematic maps. Again, as in figure ??, North East and Midwest stays flat or shrinks and is unhappy, South grows and happier, and North and West has some of the happiest places.

As per Hartt (2019), Delken (2008), Hollander (2011) shrinkage does not alwasys mean problems, and so we find outliers as shown in figure ?? at top-left, yet most places fit the patterm that the more growth, the more SWB.

Next we move to regressions of SWB on other person level controls using person level 2005 BRFSS data and county level main independent variable of interest population percent change 2000–2005 and other county level controls.

We start with a simple bivariate model in column a0 and the effect of population change is cut by half in a1 that controls for person level predictors of SWB. This is expected as SWB is mostly a function of person level characteristics, but what is remarkable and unexpected is that sequential addition of county level controls in subsequent columns does not attenuate the estimate on population change. Remarkably, in full model a4 the effect size of population change is about twicle larger than that of crime, and also substantially larger than the effect of county level income. Results using population change 2000-2010 are similar in SOM. Results using 1990-2000 population change in SOM are weaker, as expected, as that time period time change is further away from 2005 BFRSS data, but still the effects are significant and in 1990-2000 case similar to the effect of crime and county level income.

⁷Population growth correlates significantly with several variables. Notably, in growing cities there is little less crime. Also, poorer cities tend to grow faster.

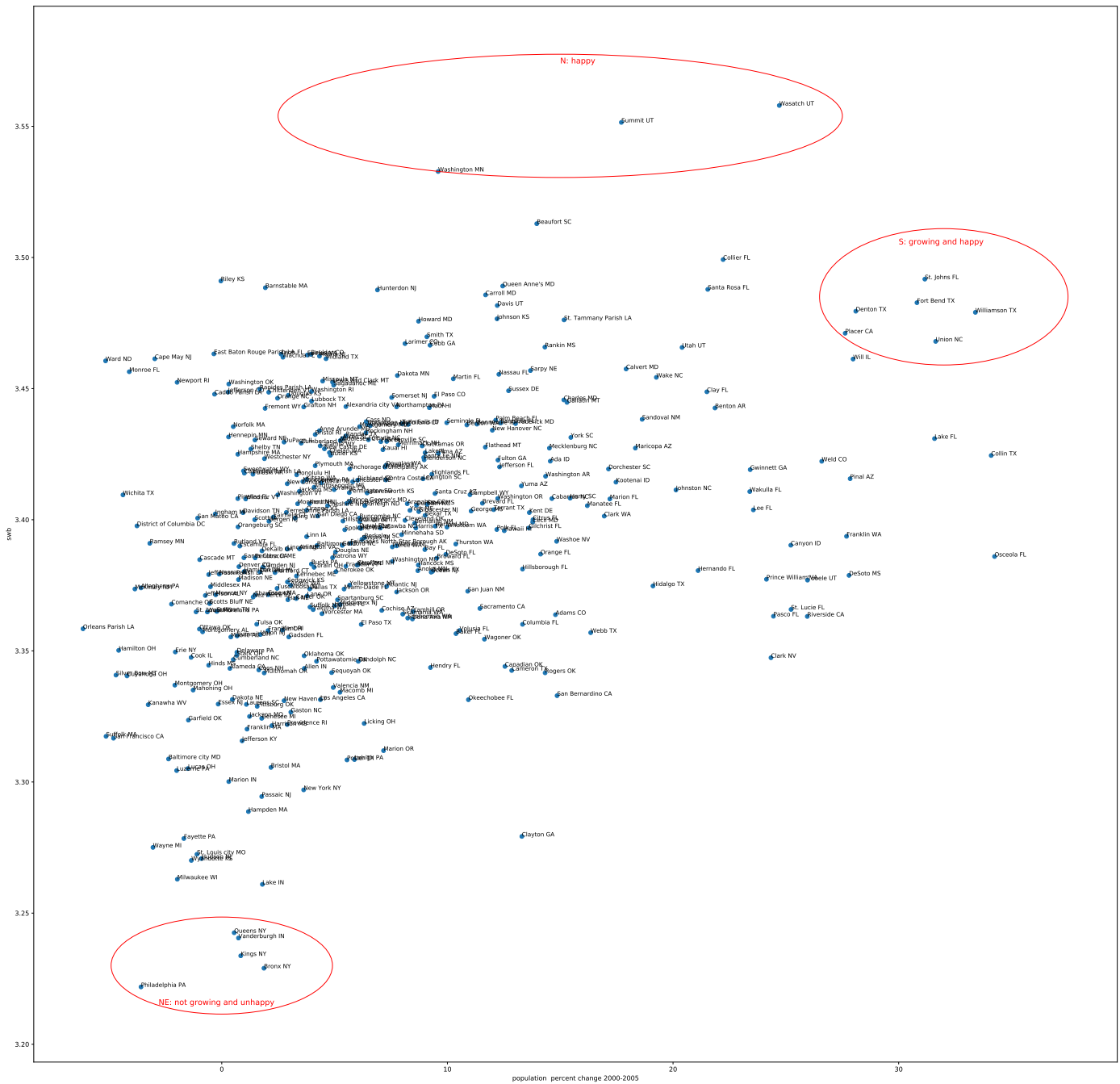
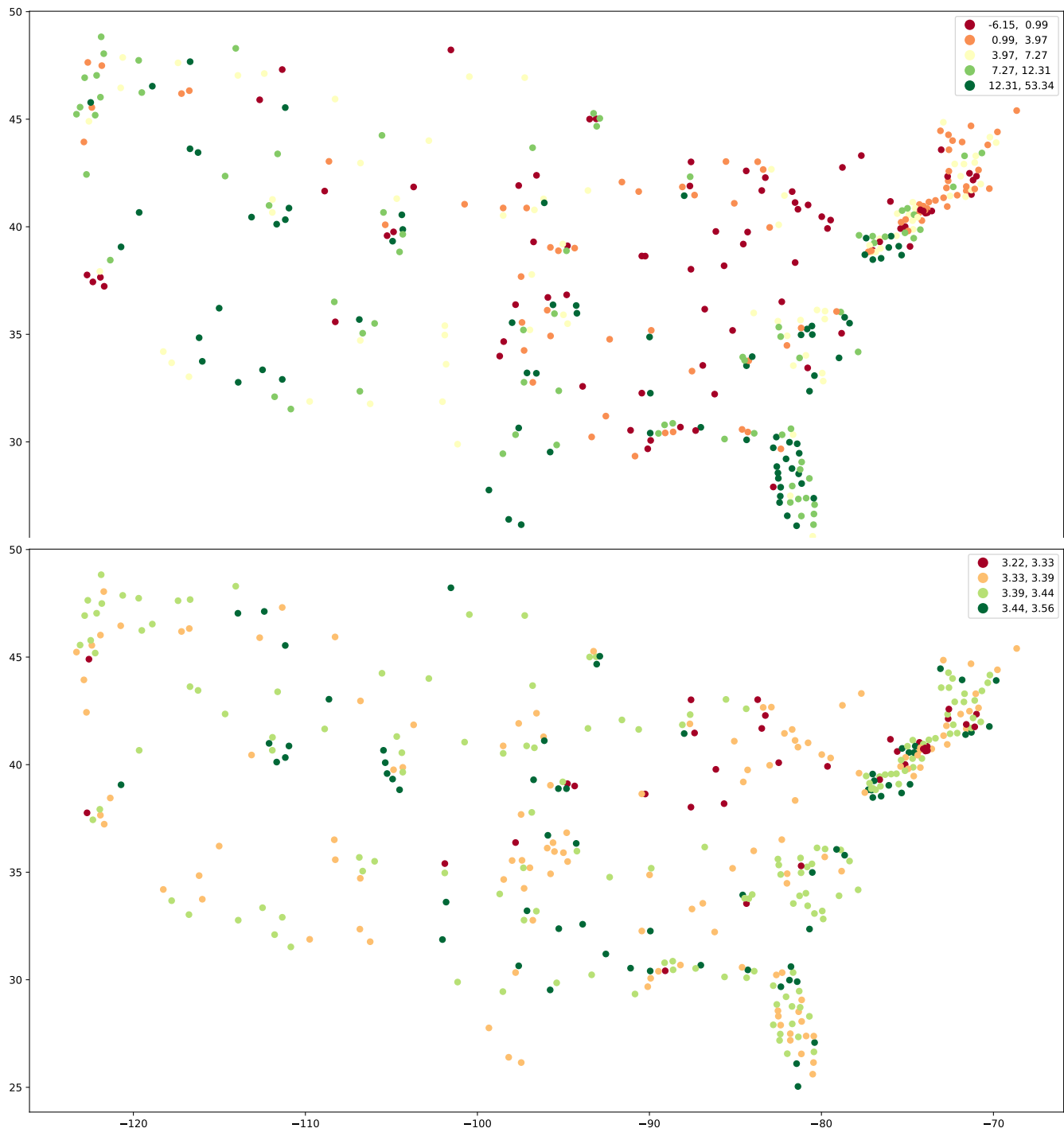


Figure 1: Note: this is a hi-res vector image that necessarily uses small font so that most labels are readable—zoom 2x to 10x to read county names. Ellipses mark patterns: NE: not growing and unhappy (except one IN county (Midwest)); S: growing and happy (except one IL county (Midwest)); N: happy. Also do note that in general around the regions marked with ellipses, there are many more counties from the same region. Notably at lower-left: Wayne MI that houses Detroit; and Suffolk MA that houses Boston. At upper-right, there are multiple Southern counties, mostly FL.

Figure 2: Thematic maps across counties of population percent change 2000–2005 in 1st panel (quantiles) and SWB (natural breaks) in 2nd panel. X and Y axes are labelled with latitude and longitude. Points are not labelled with county names for readability here, but all counties along with values on key variables are shown in Supplementary Online Material (SOM).



	a0	a1	a2	a3	a4
population percent change 2000-2005	0.036***	0.022***	0.019***	0.022***	0.022***
income		0.086***	0.088***	0.087***	0.086***
married or member of an unmarried couple		0.106***	0.107***	0.107***	0.107***
unemployed		-0.058***	-0.058***	-0.058***	-0.057***
age		-0.200***	-0.209***	-0.210***	-0.209***
age squared		0.290***	0.300***	0.301***	0.300***
White		-0.043***	-0.043***	-0.042***	-0.043***
education level		-0.014+	-0.019*	-0.019*	-0.019*
soc/emo support		0.316***	0.315***	0.315***	0.315***
general health		0.226***	0.229***	0.229***	0.228***
crime rate index			0.016**	0.018**	0.014*
persistent poverty			0.002	0.004	0.003
% Black			-0.017**	-0.013*	-0.006
low education				0.013	0.022
housing stress				-0.006	-0.001
low employment				-0.011	-0.009
population loss				-0.003	-0.003
pers. inc. (USD 1,000)/cap				0.007	0.017**
population density (persons/sq. mile) 05.00 * 1,000,000					0.000***

Discussion and future research

This is only the 2nd study on county/city population growth/shrinkage. There is some related research to the population growth-SWB nexus, but only one study, Delken (2008), uses SWB measure. Such gap in the literature is remarkable.

A remarkable result is the strength of the relationship –SWB correlates higher with population change than with county level crime and income—and the stronger effect sizes hold in regressions controlling for person level and county level predictors of SWB. Yet, the absolute effect of population change, as those of other ecological vars, is small– 10 percent increase in population change leads to little additional happiness, about .01 or .02 increase on 1-4 SWB scale.

Still, we do not necessarily contradict the shrinkage literature (e.g., Delken 2008, Hartt 2019, Hollander 2011)—shrinkage does not mean low QOL. Likewise, we find that while shrinkage results in lower SWB, there are many outliers to this pattern as shown in figure ??

ONLINE APPENDIX

[note: this section will NOT be a part of the final version of the manuscript, but will be available online instead]

Descriptive statistics are at https://colab.research.google.com/drive/1fFzDc73LbGAC-G6_I58FV1fH691NAs7_?usp=sharing

4 Robustness Checks: Additional Regression Models

Regarding regular OLS (not standardized coefficients)—the effect is small, about .002 or .001 depending on the model so if a place doubled in size (100% increase), SWB would go up by .02 or .01 on 1-4 scale, which is large at county level—as SWB ranges between 3.2 to 3.6 across counties in this sample, but increase of 100% over 5 years is very unlikely rather something like 10% which would result only in .02 or .01 increase, which is small. Still effect of population change from beta coefficients is much larger than that of crime or that of per capita income.

	a0rc	a1rc	a2rc	a3rc	a4rc
population percent change 2000-2005	0.004***	0.002***	0.002***	0.002***	0.002***
income		0.025***	0.026***	0.026***	0.025***
married or member of an unmarried couple		0.139***	0.140***	0.140***	0.140***
unemployed		-0.168***	-0.167***	-0.167***	-0.166***
age		-0.008***	-0.008***	-0.008***	-0.008***
age squared		0.000***	0.000***	0.000***	0.000***
White		-0.056***	-0.056***	-0.055***	-0.056***
education level		-0.008	-0.011*	-0.011*	-0.011*
soc/emo support		0.185***	0.184***	0.184***	0.184***
general health		0.134***	0.136***	0.135***	0.135***
crime rate index			0.000*	0.000*	0.000*
persistent poverty			0.012	0.025	0.018
% Black			-0.001*	-0.001	-0.000
low education				0.023*	0.041
housing stress				-0.008	-0.002
low employment				-0.028	-0.024
population loss				-0.006	-0.006
pers. inc. (USD 1,000)/cap				0.000	0.001**
population density per sq mile, 05-09 * 1,000,000					-1.436**
population					-0.000
constant	3.352***	2.057***	2.056***	2.037***	2.019***
N	163656	138453	132677	131657	131657

+ 0.10 * 0.05 ** 0.01 *** 0.001; clustered robust std err

Table 4: OLS (robust cluster) regressions of SWB: population percent change 2000–2005

	b0	b1	b2	b3	b4
population percent change 2000-2010	0.041***	0.022***	0.019***	0.023***	0.023***
income		0.087***	0.088***	0.087***	0.086***
married or member of an unmarried couple		0.106***	0.107***	0.107***	0.107***
unemployed		-0.058***	-0.058***	-0.058***	-0.057***
age		-0.200***	-0.209***	-0.209***	-0.209***
age squared		0.290***	0.300***	0.300***	0.300***
White		-0.044***	-0.043***	-0.042***	-0.043***
education level		-0.015+	-0.020*	-0.020*	-0.019*
soc/emo support		0.316***	0.315***	0.315***	0.315***
general health		0.226***	0.229***	0.229***	0.228***
crime rate index			0.014*	0.014*	0.010+
persistent poverty			0.003	0.005	0.004
% Black			-0.017**	-0.011+	-0.004
low education				0.015	0.021
housing stress				-0.005	-0.000
low employment				-0.015	-0.011
population loss				-0.002	-0.003
pers. inc. (USD 1,000)/cap				0.006	0.016*
population density per sq mile, 05-09 * 1,000,000					-0.021**
population					-0.005
constant	***	***	***	***	***
N	163656	138453	132677	131657	131657
+ 0.10 * 0.05 ** 0.01 *** 0.001					

Table 5: OLS beta (fully standardized) regressions of SWB: population percent change 2000–2010

	b0rc	b1rc	b2rc	b3rc	b4rc
population percent change 2000-2010	0.002***	0.001***	0.001***	0.001***	0.001***
income		0.026***	0.026***	0.026***	0.025***
married or member of an unmarried couple		0.139***	0.140***	0.140***	0.140***
unemployed		-0.168***	-0.167***	-0.167***	-0.166***
age		-0.008***	-0.008***	-0.008***	-0.008***
age squared		0.000***	0.000***	0.000***	0.000***
White		-0.057***	-0.057***	-0.055***	-0.056***
education level		-0.008+	-0.011*	-0.011*	-0.011*
soc/emo support		0.185***	0.184***	0.184***	0.184***
general health		0.134***	0.136***	0.135***	0.135***
crime rate index			0.000+	0.000+	0.000
persistent poverty			0.017	0.031	0.026
% Black			-0.001+	-0.001	-0.000
low education				0.027*	0.038
housing stress				-0.006	-0.000
low employment				-0.038+	-0.028
population loss				-0.005	-0.007
pers. inc. (USD 1,000)/cap				0.000	0.001*
population density per sq mile, 05-09 * 1,000,000					-1.399*
population					-0.000
constant	3.350***	2.058***	2.061***	2.043***	2.025***
N	163656	138453	132677	131657	131657
+ 0.10 * 0.05 ** 0.01 *** 0.001; clustered robust std err					

Table 6: OLS (robust cluster) regressions of SWB: population percent change 2000–2010

	c0	c1	c2	c3	c4
population percent change 1990-2000	0.033***	0.017***	0.012*	0.013**	0.013**
income		0.086***	0.087***	0.087***	0.086***
married or member of an unmarried couple		0.107***	0.108***	0.108***	0.108***
unemployed		-0.059***	-0.058***	-0.058***	-0.058***
age		-0.193***	-0.202***	-0.202***	-0.202***
age squared		0.283***	0.292***	0.293***	0.292***
White		-0.042***	-0.043***	-0.042***	-0.042***
education level		-0.015*	-0.020*	-0.020*	-0.020*
soc/emo support		0.317***	0.316***	0.316***	0.316***
general health		0.226***	0.229***	0.228***	0.228***
crime rate index			0.016**	0.014*	0.012*
persistent poverty			0.002	0.006	0.004
% Black			-0.021***	-0.012*	-0.007
low education				0.010	0.017
housing stress				-0.004	0.000
low employment				-0.017+	-0.012
population loss				-0.006	-0.006
pers. inc. (USD 1,000)/cap				0.002	0.011+
population density per sq mile, 05-09 * 1,000,000					-0.019*
population					-0.006
constant	***	***	***	***	***
N	162958	137885	132109	131089	131089
+ 0.10 * 0.05 ** 0.01 *** 0.001					

Table 7: OLS beta (fully standardized) regressions of SWB: population percent change 1990–2000

	c0rc	c1rc	c2rc	c3rc	c4rc
population percent change 1990-2000	0.001**	0.001**	0.000*	0.001*	0.000*
income		0.025***	0.026***	0.026***	0.025***
married or member of an unmarried couple		0.140***	0.141***	0.141***	0.141***
unemployed		-0.169***	-0.168***	-0.168***	-0.167***
age		-0.007***	-0.008***	-0.008***	-0.008***
age squared		0.000***	0.000***	0.000***	0.000***
White		-0.055***	-0.056***	-0.055***	-0.056***
education level		-0.009+	-0.011*	-0.011*	-0.011*
soc/emo support		0.186***	0.185***	0.185***	0.185***
general health		0.134***	0.136***	0.135***	0.135***
crime rate index			0.000*	0.000+	0.000+
persistent poverty			0.012	0.031	0.022
% Black			-0.001*	-0.001	-0.000
low education				0.019+	0.033
housing stress				-0.005	0.000
low employment				-0.048*	-0.036
population loss				-0.013	-0.014
pers. inc. (USD 1,000)/cap				0.000	0.001
population density per sq mile, 05-09 * 1,000,000					-1.231+
population					-0.000
constant	3.351***	2.051***	2.053***	2.050***	2.032***
N	162958	137885	132109	131089	131089

+ 0.10 * 0.05 ** 0.01 *** 0.001; clustered robust std err

Table 8: OLS (robust cluster) regressions of SWB: population percent change 1990–2000

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