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Income inequality and well-being in the U.S.: evidence of geographic-scale- and measure-dependence

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Abstract
U.S. income inequality has risen dramatically in recent decades. Researchers consistently find that greater income inequality measured at the state or national level is associated with diminished subjective well-being (SWB) in the U.S. We conduct the first multi-scale analysis (i.e., at the ZIP-code, MSA, and state levels) of the inequality-SWB relationship using SWB data from the U.S. Gallup Healthways Well-Being Index and income inequality data from the American Community Survey. We use the rich set of SWB measures afforded by the dataset (evaluative, positive hedonic, and negative hedonic) to examine the consistency of the relationship. We find that the relationship is both scale-dependent and measure-dependent: income inequality is SWB-diminishing in large regions for all measures, SWB-diminishing in small regions for negative hedonic measures, and SWB-improving in small regions for evaluative and positive hedonic measures. Lastly, we find that taking all regions together, the net relationship between income inequality and SWB is negative for all hedonic measures.

Keywords Subjective well-being · Income inequality · Happiness · Distribution of income · Health · Scale-dependence · Measure-dependence

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1 Introduction

U.S. income inequality has increased dramatically in recent decades. From 1970 to 2014, the Gini index increased 23 percent from 0.39 to 0.48, and the income share of the top one percent of households increased 133 percent from 0.09 to 0.21 (DeNavas-Walt and Proctor 2015; Piketty and Saez 2014). This rise has captured the attention of researchers, policy makers, and the public alike. In 2013, the World Bank Group set the reduction of inequality as a mission goal for the first time. As of January 2015, Thomas Piketty's 2014 book, "Capital in the Twenty-First Century," had sold over 1.5 million copies, a record for the Harvard University Press. The former presidential candidate Bernie Sanders made rising income inequality a central issue in his campaign. The Occupy Wall Street protests popularized the meme, "The 1%".

This focus assumes income inequality to be a societal problem; indeed, as president, Barack Obama called it the "defining challenge of our time." However, economists do not have a well-established normative model identifying an "optimal" level of income inequality, and our understanding of the impact of income inequality is incomplete. Researchers have attempted to identify the relationship between income inequality and well-being (WB) using subjective well-being (SWB) measures from large-scale national and international surveys; SWB is increasingly used in public policy and economic analyses, with some countries (e.g., Bhutan, Britain, and France) now including SWB metrics in official statistics (Diener et al. 2009; Di Tella and MacCulloch 2006; O'Donnell 2013; Stiglitz et al. 2010; Stone and Mackie 2013).

In Western countries, a negative inequality-SWB relationship is consistently identified. A feature of the extant literature is that the inequality-SWB relationship has only been identified using income inequality measured in large regions (e.g., states and countries). The literature on the relationship between neighbors' income and SWB has found that the sign of the relationship can depend on the scale of the region at which neighbors' income is considered. Numerous studies have found that the neighbors-income-SWB relationship is positive for small regions and negative for large regions (Brodeur and Fléche 2018; Clark et al. 2009; Deaton and Stone 2013; Graham and Felton 2006; Ifcher et al. 2018; Kingdon and Knight 2007).

We contribute to the literature by conducting, to our knowledge, the first multi-scale analysis of the inequality-SWB relationship. Specifically, we use SWB data from the U.S. Gallup Healthways Well-Being Index (GHWBI) and income inequality data from the American Community Survey (ACS) to estimate the inequality-SWB relationship separately at three geographic scales: ZIP-code, MSA, and state. Further, we use the rich set of SWB measures afforded by the GHWBI (both evaluative and hedonic) to examine the consistency of the relationship. We find that the relationship is both scale-dependent and measure-dependent: income inequality is SWB-diminishing in large regions for all measures, SWB-diminishing in small regions for negative hedonic measures, and SWB-improving in small regions for evaluative and positive hedonic measures. Additionally, we conduct analyses to determine the predicted contribution to SWB of moving from perfect equality to perfect inequality at all scales and find that the net relationship is consistently negative for all hedonic measures. This suggests that, although we identify circumstances under which income inequality can be SWB-improving, it should be considered a societal problem overall.

2 Literature review

Although neo-classical economic models do not include others' consumption as an argument of the utility function, strong empirical evidence suggests that one's WB is affected

by others' consumption. Empirical analyses of the relationship between others' income and SWB is divided into two lines of inquiry.[1] The bulk of this literature examines the relationship between measures of central tendency of a reference group's income distribution and SWB (see Ifcher et al. (2018) for a review of the neighbors-income-SWB literature). A smaller literature considers the relationship between measures of dispersion and SWB, which is the focus of this paper (see Schneider (2016) for a review of the inequality-SWB literature).

For the U.S., a negative relationship between income inequality and SWB has been empirically identified. In this literature, SWB is almost exclusively measured "evaluatively," that is, with survey items asking respondents to report their evaluations of their lives as a whole (e.g., the General Social Survey asks, "Taking things all together, how would you say things are these days—would you say that you're very happy, pretty happy, or not too happy these days?"). Income inequality is usually measured using the Gini index but has also been measured using income shares of specific income-segments (e.g., deciles). The negative inequality-SWB relationship in the U.S. has been identified both across states (i.e., more unequal states have lower SWB; e.g., Alesina et al. 2004) and over time at the national level (i.e., when the U.S. income distribution is more unequal, U.S. SWB is lower; e.g., Oishi et al. 2011). Similar results obtain within and across Western countries (Alesina et al. 2004; Delhey and Dragolov 2014; Fahey and Smyth 2004; Hagerty 2000; Layte 2012; Schwarze and Harpfer 2007; Tomes 1986).[2]

Various explanations have been offered for the negative inequality-SWB relationship, chief among them being inequity aversion (Alesina et al. 2004; Senik 2009; Thurow 1971). Other explanations are that inequality increases crime, violence, and political conflict (Diener et al. 1995; Haller and Hadler 2006); reduces social capital and trust (Brush 2007; Choe 2008; Costa and Kahn 2003; Hsieh and Pugh 1993; Kawachi et al. 1997; Kelly 2000; Savolainen 2000); and reduces the effectiveness of public institutions (Veenhoven 1995).

When using international datasets that include both non-Western and Western countries, the inequality-SWB relationship is often positive or insignificant for the former and negative for the latter. For example, Helliwell and Huang (2008), Ott (2005), and Schyns (2002) identify a positive inequality-SWB relationship using the World Values Survey. Subgroup analyses yield that the positive relationship holds for Latin American, poor, and poorly governed countries, while a negative relationship obtains for non-Latin-American countries. Using the World Database of Happiness, Berg and Veenhoven (2010) identify a positive inequality-SWB relationship in Latin America, Eastern Europe, and Asia; no significant relationship in Africa; and a negative relationship in Western countries. Graham and Felton (2006) find no significant inequality-SWB relationship in Latin America. Finally, Knight et al. (2009) identify a positive inequality-SWB relationship across counties in China.

The explanation usually offered for the positive inequality-SWB relationship is the "tunnel effect," whereby, in periods of rapid development, increasing inequality may be taken as a signal that own-income will soon rise (Hirschman and Rothschild 1973). Other explanations are that inequality increases the diversity of lifestyle and consumption choice-sets, or that inequality is a byproduct of minimal government intrusion and more personal freedom (Berg and Veenhoven 2010).

[1] Concerns about the validity and reliability of SWB metrics have been addressed at length elsewhere, and we refer interested readers to the corresponding literature. SWB metrics have been shown to be psychometrically sound, internally consistent, and comparable across individuals, over time, and for different levels of economic development (Diener et al. 1999; Frey and Stutzer 2002; Helliwell et al. 2010; Krueger and Schkade 2008).

[2] The only positive inequality-SWB relationship identified using data from a Western country is Clark (2003).

In the inequality-SWB literature, inequality has only been measured in large regions (e.g., states and countries). The smallest regions considered are Canadian Federal Election Districts (avg. pop. = 82,000) in Tomes (1986). In contrast, the neighbors-income-SWB literature has considered both large and small regions (e.g., ZIP codes). These multi-scale analyses have found that the neighbors-income-SWB relationship is scale-dependent: positive for small regions and negative for large regions (Brodeur and Fléche 2018; Clark et al. 2009; Deaton and Stone 2013; Ifcher et al. 2018; Kingdon and Knight 2007). This literature suggests that the pattern emerges due to the relative magnitudes of mediators in the neighbors-income-SWB relationship; for example, public goods may dominate other mediators in small regions, while cost-of-living may dominate in large regions.

We contribute to the literature by conducting, to our knowledge, the first multi-scale analysis of the inequality-SWB relationship. Specifically, we attempt to identify the relationship between SWB and income inequality measured separately at the ZIP-code, MSA, and state levels. Such an exercise is important for several reasons. First, restricting analyses to large regions may obscure the fundamental nature of the inequality-SWB relationship; that is, whether SWB is associated with inequality in large-regions, small-regions, or both. For example, a negative relationship identified using large regions cannot speak to whether there is a small-region inequality-SWB relationship; conversely, it may be that the negative relationship identified using large regions is driven by small-region inequality (and misattributed to large regions due to the correlation of small- and large-region inequalities). Second, it may be that, as in the neighbors-income-SWB literature, the relative magnitudes of mediators of the inequality-SWB relationship are scale-dependent. For example, it may be that the positive impact of income inequality on the choice-set may dominate other mediators in small regions, while inequity aversion may dominate in large regions. Our analysis allows for the identification of a more nuanced and potentially bifurcated relationship between income inequality and SWB.

There is increasing consensus among scholars on the need to differentiate two distinct measurable dimensions of SWB: evaluative and hedonic. Evaluative SWB captures how people assess their lives or particular domains of their lives; it is typically measured on numerical scales corresponding to life satisfaction or happiness. Hedonic SWB captures the quality of individuals' experiences in their daily lives and their moods during those experiences; it is typically measured on a numerical scale corresponding to positive and/or negative affect during a relatively short time frame.[3] The inequality-SWB relationship has been estimated using evaluative SWB measures. Two exceptions use both evaluative and hedonic SWB measures. Berg and Veenhoven (2010) and Clark (2003) find consistent inequality-SWB results across evaluative and hedonic measures (i.e., the inequality-SWB relationship is not measure-dependent). Layte (2012) only uses a hedonic measure and identifies a negative inequality-SWB relationship in Europe, consistent with the literature using evaluative measures.

Our second contribution to the literature is to use a rich set of hedonic measures (both positive and negative) to examine the inequality-SWB relationship. This is important for two reasons. First, psychologists have shown that positive and negative hedonic SWB are not opposites (e.g., survey respondents often report high levels of both) and do not necessarily respond to circumstances symmetrically (Headey and Wooden 2004); for this reason,

[3] It should be noted that there is a third dimension that has recently emerged as a distinct category: eudemonic SWB assesses the extent to which individuals have purpose or meaning in their lives. For a detailed discussion of the distinct dimensions of SWB metrics and the corresponding report for the National Academy of Sciences, see Stone and Mackie (2013).

in the SWB report for the National Academy of Sciences, Stone and Mackie (2013) recommend measuring positive and negative hedonic SWB separately when the data permits. The three inequality-SWB studies noted above that use hedonic measures pre-date this recommendation; they treat positive and negative hedonic SWB as though they lie on a continuum and construct net-positive-affect scalars by effectively subtracting negative from positive hedonic SWB. As such, divergent relationships between income inequality and positive versus negative hedonic SWB cannot be identified. Second, identifying the inequality-SWB relationship using both evaluative and hedonic SWB allows for measure-dependent results, as has been found for both own and neighbors' income, in addition to parental status. Kahneman and Deaton (2010) find a satiation point of $75,000 in the own-income-SWB relationship using hedonic but not evaluative measures. Deaton and Stone (2013) identify a negative neighbors-income-SWB relationship in small regions using hedonic measures and a positive relationship using evaluative measures. Stone and Mackie (2013) report a positive relationship between SWB and having children using evaluative measures and a negative relationship using hedonic measures.

3 Empirical strategy

3.1 Econometrics

We begin with a brief presentation of a standard SWB equation:

$$y_i = \mathbf{X_i}\boldsymbol{\alpha} + \varepsilon_i \tag{1}$$

for $i = 1, \ldots, I$, where i indexes individuals. The dependent variable y_i is the SWB of the i^{th} respondent; $\mathbf{X_i}$ is a vector of SWB-correlates of the i^{th} respondent, including demographic and socioeconomic characteristics; and ε_i captures unobserved characteristics and measurement error (Graham 2005).

In the context of this paper, the standard equation can be modified to explicitly illustrate the coefficients on regional income inequality. Further, because ZIP codes are nested in MSAs, and MSAs are sometimes, but not always, nested in states, we estimate a four-way (individual, ZIP code, MSA, state) cross-effects model with a multilevel mixed-effects linear regression (STATA command "mixed"):[4,5]

$$y_i = \beta_0 + \beta_1 \text{ZIPGini}_i + \beta_2 \text{MSAGini}_i + \beta_3 \text{StateGini}_i + \mathbf{X_i}\boldsymbol{\gamma} + \mathbf{Z_i}\mathbf{b} + \varepsilon_i. \tag{2}$$

The independent variables ZIPGini_i, MSAGini_i ,and StateGini_i are the Gini indexes for the i^{th} respondent's ZIP code, MSA, and state, respectively.[6] $\mathbf{X_i}$ is a vector of SWB-correlates

[4] For example the most populous MSA—the New York-Newark-Jersey City, NY-NJ-PA Metropolitan Statistical Area—spans three states.

[5] Equation 2 can be estimated with multilevel mixed-effects linear regression, logit (for binary dependent variables), or ordered logit (for categorical dependent variables). While in theory, ordinal WB variables should be estimated as (ordered) logits, the consistency of results and the relative ease of interpretation of linear-regression estimates have made linear-regression estimates the norm in the SWB literature (see Van Praag and Ferrer-i-Carbonell (2004)).

[6] ZIP-codes are postal designations with ˜7,500 people on average and range in population from 1 to 100,000. The Census defines the MSA as "a large population nucleus [with a minimum of 50,000 individuals], together with adjacent communities having a high degree of social and economic integration with that core. Metropolitan areas comprise one or more entire counties, except in New England, where cities and towns are the basic geographic units." (http://quickfacts.census.gov/qfd/meta/long_metro.htm) MSAs have ˜850,000 people on average and range in population from 50,000 to 20,000,000. States have ˜6,000,000 people on average and range in population from 500,000 to 38,000,000.

for the i^{th} respondent, including the following demographic and socioeconomic characteristics: ZIP-code median income, MSA median income, state median income, own income, gender, age, race, education, employment, marital status, and "parental" status (the presence of any children under age 18 living in the household), in addition to controls for day, month, and year of interview. $\mathbf{Z_i}$is a vector of indicators identifying respondent i's ZIP code, MSA, and state, and $\mathbf{b}$ is the corresponding vector of random effects. The coefficients of interest β_1, β_2, and β_3 capture the relationship between SWB and ZIP-code, MSA, and state income

Table 1 Summary statistics

	Mean	St. Dev.
BPL	7.00	(1.89)
Enjoyment	0.86	(0.35)
Happiness	0.89	(0.32)
Stress	0.38	(0.49)
Worry	0.30	(0.46)
Self-reported health	3.55	(1.10)
BPL in five years	7.63	(2.20)
Satisfaction with city	0.88	(0.33)
Asthma	0.11	(0.31)
Cancer	0.10	(0.29)
Depression	0.16	(0.37)
Diabetes	0.12	(0.32)
Heart attack	0.05	(0.21)
High blood pressure	0.34	(0.47)
High cholesterol	0.31	(0.46)
BMI	27.29	(5.59)
Smoke	0.16	(0.37)
Exercise	2.82	(2.40)
Healthy eating	4.14	(2.53)
Median annual household income	$54,000	–
Median ZIP-code income	$61,198	(23,325.00)
Median MSA income	$54,083	(10,098.00)
Median state income	$52,126	(7,625.85)
ZIP-code Gini index	0.43	(0.05)
MSA Gini index	0.46	(0.02)
State Gini index	0.47	(0.02)
Female	0.50	(0.50)
Black	0.10	(0.29)
White	0.84	(0.36)
Age	52.79	(17.74)
Married	0.54	(0.50)
Did not complete high school	0.05	(0.21)
High school graduate	0.17	(0.38)
College degree	0.25	(0.43)
Post graduate work or degree	0.22	(0.41)
Children in household	0.30	(0.46)
Employed in last 7 days	0.51	(0.50)
Observations	456,719	

inequality, respectively. A positive (negative) estimate of β indicates that SWB is increasing (decreasing) in income inequality.

3.2 Data

The GHWBI has conducted a telephone survey (landline or mobile) with approximately 1,000 U.S. inhabitants per day in repeated cross-sections since January 2008 using a stratified sampling technique.[7] Our analysis uses data from 2011 through 2012, during which time 685,368 individuals were surveyed. Our final sample consists of 456,719 individuals; as explained below, observations missing necessary information were dropped. Summary statistics are presented in Table 1.

Various measures of SWB are used as the dependent variable y_i. Our evaluative SWB measure is the Cantril ladder "best possible life" (BPL) index. The item reads: "Please imagine a ladder with steps numbered from 0 at the bottom to 10 at the top. The top of the ladder represents the best possible life for you, and the bottom of the ladder represents the worst possible life for you. On which step of the ladder would you say you personally feel you stand at this time?"[8] Our hedonic SWB measures are enjoyment, happiness, stress, and worry. For each, respondents are asked: "Did you experience the following feelings during a lot of the day yesterday? How about _____?" An indicator variable is created for each.

To measure own income, we use responses to the item: "What is your total MONTHLY household income, before taxes? Please include income from wages and salaries, remittances from family members living elsewhere, farming, and all other sources." Eleven possible response-categories are included: under $60; $60–$499; $500–$999; $1,000–$1,999; $2,000–$2,999; $3,000–$3,999; $4,000–$4,999; $5,000–$7,499; $7,500–$9,999; $10,000 and over; and unknown. Respondents' annual household income variable is calculated as twelve times the midpoint of the corresponding monthly-income category. All regressions include an indicator variable for top-coded income.[9]

ZIP-code, MSA, and state characteristics come from the U.S. Census Bureau's 2011 and 2012 ACS. The ACS is administered by mail to roughly 2,000,000 households per year and includes questions regarding demographic, economic, financial, housing, and social characteristics. The ACS reports ZIP-code, MSA, and state Gini indexes and median incomes that we match to the GHWBI data. The ACS's ZIP-code Gini index and median income data are only available as five-year estimates (e.g., 2011 ZIP-code median income is the 2007-2011 median).[10] This is not the case for MSA and state Gini indexes and median incomes.[11]

Some features of the Gini indexes' distributions warrant mention. First, at all three levels, Gini indexes are tightly distributed around their means, with the unsurprising pattern that ZIP codes exhibit less average inequality than MSAs and states, while the reverse is true for their standard deviations (mean ZIP-code Gini = 0.43, sd = 0.05; mean MSA Gini = 0.46,

[7] Graham is an academic advisor to the GHWBI and in that capacity has access to the data.

[8] Mean BPL = 7.0, sd = 1.89. Of the total sample, 0.5% had missing values for BPL or refused to respond to that item. Those observations were dropped.

[9] Median annual household income = $54,000. Income data was missing for 109,642 (16%) observations; these observations were dropped.

[10] Median ZIP-code income was missing from the ACS for a small number of observations; these observations were dropped. Also, 141,175 (20.6%) respondents did not live in an MSA; these observations were dropped.

[11] As a robustness check, in analyses not shown, we use five-year estimates of MSA and state Gini indexes and median income and obtain the same results.

Table 2 Gini-index correlation table

	ZIP-code Gini index (1)	MSA Gini index (2)	State Gini index (3)
ZIP-code Gini index	1.0000		
MSA Gini index	0.2143	1.0000	
State Gini index	0.1737	0.4714	1.0000

Notes: Spearman correlations. The p-value for each is 0.00

sd = 0.02; and mean state Gini = 0.47, sd = 0.02). Such tight distributions generally reduce the efficiency of estimated coefficients, but this potential obstacle to precise estimation is offset by the GHWBI's large sample. Second, the three regions' Gini indexes are correlated (see Table 2). Inclusion of all three Gini indexes on the right hand side of Eq. 2 avoids the omitted variable bias that could result from estimating separate regressions for each of the three regional scales.

4 Results

4.1 Main results

We find that income inequality in large regions is associated with diminished evaluative SWB. Estimating Eq. 2 with BPL as the dependent variable, the MSA Gini-index coefficient is negative and significant, and the state Gini-index coefficient is negative and marginally significant (see Table 3). This result is consistent with the literature pertaining to Western countries and shows that the results from the literature are robust to the mixed-effects model

Table 3 Multi-scale model

	ZIP-code Gini (1)	MSA Gini (2)	State Gini (3)	Net relation. (4)
BPL	0.999****	−0.571***	−0.779*	−0.350
n=437,848	(0.059)	(0.218)	(0.444)	(0.443)
Enjoyment	0.034***	−0.074**	−0.245****	−0.285****
n=437,050	(0.011)	(0.037)	(0.059)	(0.059)
Happiness	0.026***	−0.099***	−0.207****	−0.279****
n=436,877	(0.010)	(0.032)	(0.051)	(0.050)
Stress	0.089****	0.147****	0.107	0.343****
n=437,373	(0.015)	(0.045)	(0.082)	(0.080)
Worry	0.114****	0.301****	0.135	0.549****
n=437,415	(0.015)	(0.050)	(0.102)	(0.101)

Notes: Standard errors in parentheses. All models are estimated using a four-way (individual, ZIP code, MSA, state) cross-effects model with a multilevel mixed-effects linear regression, conditioning on ZIP-code, MSA, and state median income; own income; gender (male or female); race (white, black, Asian, Hispanic); age (and age-squared); marital status (never-married, married, divorced, separated, domestic partner), parental status (child under 18 living in household) & employment status (employed in last seven days); education (less than high school, high school, technical school, some college, college, post-college); and day, month, & year of interview fixed effects. *, **, ***, **** signify the coefficient is statistically significant at $p < 0.10, 0.05, 0.01, 0.001$, respectively

and inclusion of controls for smaller-region income inequality (i.e., the inclusion of the ZIP-code Gini index as a covariate in Eq. 2).

A contribution of this study is examining the inequality-SWB relationship in small regions (here defined as ZIP codes). As noted above, the next smallest region considered in the literature is roughly 100 (10) times more populous using U.S. (international) data. In contrast to the MSA and state results, we find that the ZIP-code Gini-index coefficient is positive and significant, indicating that income inequality in small regions is associated with improved evaluative SWB. That the relationship between income inequality and evaluative SWB is scale-dependent (i.e., SWB-diminishing in large regions and SWB-improving in small regions) is also a novel contribution.

The magnitude of these coefficients is economically meaningful. BPL increases by 0.065 (= 0.065 * 0.999) steps and decreases by 0.018 (= 0.031 * -0.571) steps over the ZIP-code and MSA Gini-index interquartile ranges.[12] For comparison, a well-known correlate of BPL is employment, the coefficient of which is 0.135 (s.e. = 0.006). Thus, the magnitude of the change in BPL associated with spanning the ZIP-code (MSA) Gini-index interquartile range is approximately a half (seventh) of the change associated with employment.

Estimating Eq. 2 with enjoyment and happiness as dependent variables reveals scale-dependent results similar to using BPL: MSA and state Gini-index coefficients are negative and significant, and ZIP-code Gini-index coefficients are positive and significant (see Table 3). In contrast, estimating Eq. 2 with stress and worry as dependent variables reveals that ZIP-code and MSA Gini-index coefficients are positive and significant, while the state coefficients are positive and insignificant.

We are also able to estimate the net relationship between income inequality and SWB. Specifically, we calculate the predicted change in SWB associated with experiencing perfect income inequality, as compared to perfect equality, at all scales ($\beta_1 + \beta_2 + \beta_3$). Such a calculation has the benefit of not arbitrarily privileging one regional scale over another. This calculation yields net relationships that are SWB-diminishing, with t-scores ranging from 4.2 to 5.5, for all hedonic measures (see Table 3). This indicates that, although hedonic SWB may improve with income inequality in small regions, in net, income inequality is hedonic-SWB-diminishing. For BPL, the net relationship is negative and insignificant.

4.2 Subgroup analyses

To determine whether our main results are consistent across various subgroups, we estimate Eq. 2 and net relationships for the regional, demographic, and socioeconomic subgroups in Table 4. We conduct Wald tests of the equality of corresponding coefficients across subgroups. For tractability, in Table 5 we suppress standard errors and report the Gini-index coefficients for subgroups in which systematic differences are identified. Complete subgroup analyses are reported in Appendix Table 8. In Table 5 and Appendix Table 8, asterisks (*) indicate the statistical significance of individual coefficients, and karats (^) indicate the statistical significance of subgroup differences.

Consider the relationship between SWB and the MSA Gini index separately for bottom and top MSA median income quartiles (see Panel B, Column (2) versus Column (6)). For BPL, enjoyment, happiness, and worry, MSA inequality is significantly more SWB-diminishing for the top than the bottom quartile. Moreover, the baseline result that MSA

[12] The interquartile range for the ZIP-code and MSA Gini indexes are 0.065 (from 0.390 to 0.455) and 0.031 (from 0.445 to 0.476), respectively.

Table 4 Subgroups

Bottom and top ZIP-code Gini-index quartiles (Gini < 0.390 and Gini > 0.455)
Bottom and top MSA Gini-index quartiles (Gini < 0.445 and Gini > 0.476)
Bottom and top ZIP-code median-income quartiles (inc. < $44,730 and inc. > $73,193)
Bottom and top MSA median-income quartiles (inc. < $46,648 and inc. > $59,261)
Bottom and top own-income quartiles (inc. < $24,000 and inc. > $90,000)
Race (whites and blacks)
Education (ed. ≤ high school completion and ed. ≥ college completion)
Marital status (married and unmarried)
Gender (female and male)
Parental status (no children < age 18 living in household and at least 1 child < age 18 living in household)
Bottom and top age quartiles (age < 40 and age > 67)

inequality is SWB-diminishing for all measures holds only for the top quartile, with insignificant coefficients for the bottom quartile (except worry, which is marginally significant). Similarly, the ZIP-code median-income subgroup analyses reveal that the costs of MSA inequality are driven by the ZIP codes with the highest median incomes (see Panels A). Further, all the income-based subgroup analyses reveal that ZIP-code inequality is significantly SWB-diminishing for worry (and in most cases stress) for top but not bottom quartiles. Taken together, it appears that, when SWB-diminishing, income inequality is more SWB-diminishing for top than bottom income subgroups. This accords with subgroup analyses in Alesina et al. (2004) which find no inequality-SWB relationship for low-income individuals in the U.S.; the authors attribute this to perceived economic mobility. Another possible explanation is that individuals with low-income and from low-income regions may perceive such little economic mobility for themselves and/or experience such economic hardship that they are disaffected and resigned to the income distribution. These possible explanations may also apply to the results of our race-based subgroup analyses. We find that the baseline results are driven by white respondents, with the SWB-inequality relationship largely absent for black respondents (see Panel D).

4.3 Other specifications

Given the Gini index's sensitivity to the middle of the income distribution (see Atkinson 1970), we examine the relationship between income inequality and SWB replacing the Gini indexes in Eq. 2 with measures of income inequality that focus on the tails of the income distribution: the income-share of the bottom quintile, top quintile, and top

Table 5 Subgroup analyses

	n	ZIP-code Gini (1)	MSA Gini (2)	State Gini (3)	Net relation. (4)	n	ZIP-code Gini (5)	MSA Gini (6)	State Gini (7)	Net relation. (8)
Panel A:										
Bottom ZIP-code median-income quartile						Top ZIP-code median-income quartile				
BPL	108,949	1.067****	−0.562*,^^	0.097	0.601	BPL	109,921	0.895****	−1.684****,^^	−0.571	−1.359**
Enjoyment	108,707	0.042*	−0.043^	−0.255***	−0.257***	Enjoyment	109,763	0.029	−0.190***,^	−0.208**	−0.369****
Happiness	108,643	0.041*	−0.104**	−0.155*	−0.217***	Happiness	109,740	0.017	−0.158***	−0.151*	−0.292****
Stress	108,804	0.085***	−0.081^^^^	−0.173^^^^	−0.169	Stress	109,836	0.101****	0.366****,^^^^	0.356****,^^^^	0.823****
Worry	108,809	0.048^^	0.168**,^^^^	−0.011	0.205	Worry	109,836	0.152****,^^^^	0.564****,^^^^	0.162	0.878****
Panel B:										
Bottom MSA median-income quartile						Top MSA median-income quartile				
BPL	109,686	0.914****,^^	−0.211^^^^	0.406	1.109	BPL	112,509	1.281****,^^	−2.319****,^^^^	−0.702	−1.740***
Enjoyment	109,478	0.080****	0.024^^^^	−0.342***	−0.237**	Enjoyment	112,290	0.043**	−0.317****,^^^^	−0.189**	−0.463****
Happiness	109,424	0.045**	0.005^^^^	−0.261**	−0.211**	Happiness	112,254	0.019	−0.281****,^^^^	−0.136*	−0.398****
Stress	109,555	0.033	0.078	−0.212^^	−0.101	Stress	112,363	0.104****	0.260***	0.206**,^^	0.570****
Worry	109,554	0.012^^^^	0.137*,^^	−0.258^^	−0.110	Worry	112,406	0.160****,^^^^	0.480****,^^	0.146^^	0.786****
Panel C:										
Bottom own-income quartile						Top own-income quartile				
BPL	86,621	1.413****	−0.085^	−0.098	1.229**	BPL	106,874	1.126****	−0.840**,^	−0.940	−0.653
Enjoyment	86,305	0.032	−0.078	−0.284***	−0.330***	Enjoyment	106,762	0.049**	−0.070	−0.243***	−0.264***
Happiness	86,237	0.030	−0.182***	−0.271***	−0.423****	Happiness	106,757	0.050***	−0.107*	−0.147*	−0.204***
Stress	86,449	0.028^^^	0.054	0.064	0.145	Stress	106,808	0.151****,^^^	0.222***	0.038	0.411****
Worry	86,466	0.015^^^^	0.381****	−0.002	0.394***	Worry	106,799	0.176****,^^^^	0.358****	0.047	0.581****

Table 5 (continued)

	n	ZIP-code Gini (1)	MSA Gini (2)	State Gini (3)	Net relation. (4)		n	ZIP-code Gini (5)	MSA Gini (6)	State Gini (7)	Net relation. (8)
Panel D:											
White						Black					
BPL	369,587	1.002****,^^^	−0.719****	−1.002**,^^	−0.718*	BPL	41,392	0.376*,^^^	−0.364	0.489^^	0.500
Enjoyment	369,950	0.031**	−0.106***,^^^^	−0.260****	−0.335****	Enjoyment	41,325	0.020	0.189**,^^^^	−0.227*	−0.019
Happiness	369,827	0.028***	−0.127****,^^	−0.188****	−0.287****	Happiness	41,280	−0.001	0.057^^	−0.136	−0.080
Stress	369,210	0.087****	0.228****,^^^^	0.127	0.442****	Stress	41,348	0.106**	−0.176^^^^	−0.053	−0.123
Worry	369,243	0.129****	0.372****,^^^^	0.152	0.653****	Worry	41,346	0.063	−0.114^^^^	0.037	−0.015

Notes: All models are estimated using a four-way (individual, ZIP code, MSA, state) cross-effects model with a multilevel mixed-effects linear regression, conditioning on ZIP-code, MSA, and state median income; own income; gender (male or female); race (white, black, Asian, Hispanic); age (and age-squared); marital status (never-married, married, divorced, separated, domestic partner), parental status (child under 18 living in household) & employment status (employed in last seven days); education (less than high school, high school, technical school, some college, college, post-college); and day, month, & year of interview fixed effects. *, **, ***, **** signify the coefficient is statistically significant at $p < 0.10, 0.05, 0.01, 0.001$, respectively. ^, ^^, ^^^, ^^^^signify the coefficients in columns (1) & (5), (2) & (6), or (3) & (7) are significantly different (using a Wald test of the equality of coefficients) at $p < 0.10, 0.05, 0.01, 0.001$, respectively

Table 6 Specifications with alternate measures of income inequality

	n	Zip-code Gini (1)	MSA Gini (2)	State Gini (3)	Net relation. (4)
Income of share of bottom quintile					
BPL	434,445	−0.0495****	0.0159	0.0404	0.0068
Enjoyment	433,660	−0.0014**	0.0043**	0.0116****	0.0145****
Happiness	433,481	−0.0015***	0.0072****	0.0101****	0.0157****
Stress	433,976	−0.0055****	−0.0061**	−0.0045	−0.0162****
Worry	434,018	−0.0062****	−0.0114****	−0.0050	−0.0226****
Income of share of top quintile					
BPL	434,445	0.0116****	−0.0069***	−0.0096*	−0.0049
Enjoyment	433,660	0.0004***	−0.0007*	−0.0029****	−0.0032****
Happiness	433,481	0.0003**	−0.0009***	−0.0024****	−0.0031****
Stress	433,976	0.0009****	0.0015***	0.0014	0.0038****
Worry	434,018	0.0012****	0.0034****	0.0019*	0.0065****
Income of share of top five percent					
BPL	434,445	0.0121****	−0.0064***	−0.0104*	−0.0046
Enjoyment	433,660	0.0005****	−0.0002	−0.0033****	−0.0030****
Happiness	433,481	0.0003***	−0.0003	−0.0030****	−0.0030****
Stress	433,976	0.0007****	0.0010*	0.0024**	0.0042****
Worry	434,018	0.0012****	0.0026****	0.0034**	0.0071****

Notes: All models are estimated using a four-way (individual, ZIP code, MSA, state) cross-effects model with a multilevel mixed-effects linear regression, conditioning on ZIP-code, MSA, and state median income; own income; gender (male or female); race (white, black, Asian, Hispanic); age (and age-squared); marital status (never-married, married, divorced, separated, domestic partner), parental status (child under 18 living in household) & employment status (employed in last seven days); education (less than high school, high school, technical school, some college, college, post-college); and day, month, & year of interview fixed effects. *, **, ***, **** signify the coefficient is statistically significant at $p < 0.10, 0.05, 0.01, 0.001$, respectively

five percent.[13] In each of the three specifications, the main results hold: income inequality is SWB-improving for small regions and SWB-diminishing in large regions using BPL, enjoyment, and happiness as the dependent variable; and income inequality is SWB-diminishing in both small and large regions using stress and worry as the dependent variable (see Table 6).

In an additional specification, we estimate Eq. 2 including as covariates the ZIP-code, MSA, and state poverty and unemployment rates. The main results hold, indicating that the relationship between income inequality and SWB is not driven by regional poverty and unemployment rates (see Table 7). Finally, we restrict the sample to ZIP-codes with at least 30 and 60 respondents and the main results hold, indicating that our results are not driven by small ZIP codes where inequality might be more salient (see Table 7).

[13] Other measures of income inequality like the Theil Index and Mean Log Deviation are not available at the ZIP-code level. Further, the GHWBI does not contain sufficient observations from each ZIP code to precisely calculate such measures from within the dataset.

Table 7 Additional specifications

	n	Zip-code Gini (1)	MSA Gini (2)	State Gini (3)	Net relation. (4)
Include unemployment and poverty rates					
BPL	437,723	0.941****	−0.735****	−1.023**	−0.817*
Enjoyment	436,925	0.033***	−0.069*	−0.293****	−0.329****
Happiness	436,752	0.029***	−0.096***	−0.278****	−0.345****
Stress	437,248	0.095****	0.152****	0.090	0.337***
Worry	437,290	0.112****	0.314****	0.005	0.431****
$\geq$ 30 respondent in ZIP code					
BPL	358,978	1.114****	−0.897****	−1.021**	−0.805*
Enjoyment	358,338	0.037***	−0.069*	−0.330****	−0.363****
Happiness	358,182	0.030***	−0.121****	−0.246****	−0.337****
Stress	358,605	0.095****	0.127***	0.118	0.340****
Worry	358,631	0.114****	0.335****	−0.004	0.445***
$\geq$ 60 respondent in ZIP code					
BPL	232,097	0.972****	−0.973****	−0.567	−0.568
Enjoyment	231,700	0.028	−0.112**	−0.277***	−0.361****
Happiness	231,631	0.021	−0.102**	−0.193**	−0.274****
Stress	231,856	0.124****	0.140**	0.056	0.320***
Worry	231,878	0.166****	0.301****	−0.070	0.398***

Notes: All models are estimated using a four-way (individual, ZIP code, MSA, state) cross-effects model with a multilevel mixed-effects linear regression, conditioning on ZIP-code, MSA, and state median income; own income; gender (male or female); race (white, black, Asian, Hispanic); age (and age-squared); marital status (never-married, married, divorced, separated, domestic partner), parental status (child under 18 living in household) & employment status (employed in last seven days); education (less than high school, high school, technical school, some college, college, post-college); and day, month, & year of interview fixed effects. *, **, ***, **** signify the coefficient is statistically significant at $p < 0.10, 0.05, 0.01, 0.001$, respectively

5 Discussion

The current paper makes two novel contributions to the inequality-SWB literature. First, we estimate the inequality-SWB relationship at three different geographic scales: ZIP codes, MSAs, and states. Second, we use a rich set of both evaluative and hedonic SWB measures. Replicating the results from the extant literature, we find a negative inequality-SWB relationship in large regions using an evaluative measure. In small regions, which have not been studied in the literature, we find a positive relationship, indicating that the inequality-SWB relationship is scale-dependent. Further, we find that our evaluative results extend to positive hedonic measures (enjoyment and happiness) in both small and large regions. Lastly, for negative hedonic measures (stress and worry), the bifurcation of the inequality-SWB relationship does not hold: income inequality is consistently SWB-diminishing in both small and large regions for these measures.

The literature review discusses mediators for the inequality-SWB relationship. Recall that negative mediators include inequity aversion; that inequality increases crime, violence, and political conflict; and that inequality reduces social capital, trust, and the effectiveness of public institutions. Positive mediators include the tunnel effect, that inequality expands the choice-set, and that inequality indicates minimal government intrusion. Importantly,

all of these mediators may be operant concurrently. Thus, a positive (negative) Gini-index coefficient simply indicates that the positive (negative) mediators dominate. To identify specific mediators is beyond the scope of this paper, but we discuss possible explanations below.

Our small-region result, that income inequality is SWB-improving (as measured by BPL, happiness, and enjoyment), is novel in a Western-country context. Positive inequality-SWB relationships have generally been identified in non-Western countries. The primary explanation for such results in those contexts is the tunnel effect, whereby increasing inequality may be taken as a signal that own-income will rise in periods of rapid development. While the tunnel effect might explain some of our differential income-subgroup results, there are other possible explanations. It may be that the inequality-SWB relationship is less negative for low-income respondents because they are less aware of or sensitive to income inequality than high-income respondents. Indeed, a remarkably high tolerance for inequality among low-income individuals in the U.S. has been reported for decades. In part, it may be due to a belief in the potential for upward economic mobility. It may also be due to beliefs about the causes of inequality, that it simply reflects "fair" market rewards. Butler (2016) finds that individuals randomly assigned to a low-pay treatment in an economic experiment are more likely to believe that they performed poorly than those assigned to a high-pay treatment, despite no difference in actual performance. This might suggest that low-income respondents believe that their low income is deserved, and therefore are not as disturbed by income inequality. In the U.S., Ashok et al. (2015) report a general ignorance of the government's role in health care provision and other public programs that tend to mediate the distribution of income in other countries. There is also surprising opposition to these programs from many of the low-income groups who benefit from them, particularly poor whites.

A useful framework for thinking about the scale-dependence we identify in the inequality-SWB relationship comes from Clark and D'Ambrosio (2015). They separate the impact of income inequality into the normative and comparative components: the former represents one's disinterested evaluation of the income distribution (i.e., were they not in it), while the latter represents the evaluation of the income distribution as experienced by the individual. The normative frame may then come to dominate the comparative frame as scale increases. For example, consider two individuals with similar income and ZIP-code median income, but the first lives in a more unequal MSA than the second. The two may experience the same exposure to inequality in their day-to-day lives and therefore have similar comparative views of inequality, but the first may report lower SWB than the second because of a normative consideration like inequity aversion.

Lastly, the results illustrate the importance of having a rich set of SWB measures, as the positive inequality-SWB relationship identified in small regions using evaluative and positive hedonic SWB measures does not hold for negative hedonic measures. Thus, income inequality is both SWB-diminishing and SWB-improving in small regions: increasing stress and worry and increasing BPL, enjoyment, and happiness. This suggests that for different SWB measures different mediators are dominant. For example, suppose that the only mediators in the inequality-SWB relationship at the ZIP-code level are increased consumption choices and increased crime, with the former primarily increasing enjoyment and happiness, and the latter primarily increasing stress and worry. If BPL reflects a subjectively weighted average of these, and the positive-hedonic effects outweigh the negative, we would observe BPL, enjoyment, happiness, stress, and worry all increasing with income inequality. We leave it to future research to better understand the determinants of different SWB measures.

Appendix

Table 8 Full subgroup analyses

	n	ZIP-code Gini (1)	MSA Gini (2)	State Gini (3)	Net relation. (4)	n	ZIP-code Gini (5)	MSA Gini (6)	State Gini (7)	Net relation. (8)
Bottom ZIP-code Gini-index quartile						**Top ZIP-code Gini-index quartile**				
BPL	109,822	-0.016 ^^^	-0.880 **	-0.574	-1.471 ***	BPL	109,096	1.404 ****· ^^^	-0.542	-0.612	0.249
		(0.234)	(0.356)	(0.544)	(0.554)			(0.160)	(0.344)	(0.533)	(0.551)
Enjoyment	109,642	-0.039 ^^	-0.125 **	-0.293 ****	-0.457 ****	Enjoyment	108,868	0.083 ***· ^^	-0.146 **	-0.174 **	-0.237 ***
		(0.045)	(0.062)	(0.085)	(0.089)			(0.030)	(0.060)	(0.085)	(0.088)
Happiness	109,612	0.004	-0.125 **	-0.238 ****	-0.359 ****	Happiness	108,841	0.044	-0.180 ****	-0.218 ***	-0.354 ****
		(0.040)	(0.053)	(0.071)	(0.075)			(0.027)	(0.052)	(0.073)	(0.075)
Stress	109,710	0.121 **	0.325 ****	0.011	0.457 ****	Stress	108,972	0.054	0.169 **	0.044	0.267 **
		(0.061)	(0.077)	(0.120)	(0.124)			(0.042)	(0.076)	(0.121)	(0.123)
Worry	109,733	0.158 ***	0.444 ****· ^^	-0.015	0.587 ****	Worry	108,974	0.054	0.240 ***· ^^	0.122	0.416 ***
		(0.059)	(0.084)	(0.134)	(0.137)			(0.040)	(0.082)	(0.133)	(0.136)
Bottom MSA Gini-index quartile						**Top MSA Gini-index quartile**				
BPL	109,437	1.017 ****	-0.970	-0.452	-0.406	BPL	109,707	1.129 ****	-1.597 **	0.042	-0.426
		(0.133)	(0.622)	(0.467)	(0.700)			(0.107)	(0.736)	(0.870)	(1.021)
Enjoyment	109,244	0.049 **	-0.072	-0.254 ****	-0.276 **	Enjoyment	109,448	0.047 **	-0.148	-0.326 **	-0.427 ***
		(0.025)	(0.110)	(0.071)	(0.117)			(0.020)	(0.127)	(0.139)	(0.165)
Happiness	109,223	0.053 **	-0.172 *	-0.192 ***	-0.311 ***	Happiness	109,398	0.022	-0.009	-0.292 **	-0.278 *
		(0.022)	(0.094)	(0.065)	(0.102)			(0.018)	(0.107)	(0.129)	(0.144)
Stress	109,320	0.090 ***	0.224 *	0.074	0.388 ***	Stress	109,547	0.104 ****	0.025	0.181	0.310
		(0.034)	(0.136)	(0.100)	(0.151)			(0.027)	(0.152)	(0.193)	(0.207)
Worry	109,339	0.142 ****	0.529 ****	-0.007	0.665 ****	Worry	109,589	0.113 ****	0.188	0.059	0.360
		(0.033)	(0.150)	(0.123)	(0.176)			(0.027)	(0.176)	(0.224)	(0.254)
Bottom ZIP-code median-income quartile						**Top ZIP-code median-income quartile**				
BPL	108,949	1.067 ****	-0.562 *· ^^	0.097	0.601	BPL	109,921	0.895 ****	-1.684 ****· ^^	-0.571	-1.359 **
		(0.131)	(0.333)	(0.633)	(0.625)			(0.107)	(0.419)	(0.600)	(0.594)
Enjoyment	108,707	0.042 *	-0.043 ^	-0.255 ***	-0.257 ***	Enjoyment	109,763	0.029	-0.190 ***· ^	-0.208 **	-0.369 ****
		(0.025)	(0.059)	(0.090)	(0.089)			(0.020)	(0.071)	(0.083)	(0.083)
Happiness	108,643	0.041 *	-0.104 **	-0.155 *	-0.217 ***	Happiness	109,740	0.017	-0.158 ***	-0.151 *	-0.292 ****
		(0.022)	(0.052)	(0.086)	(0.084)			(0.018)	(0.060)	(0.079)	(0.077)
Stress	108,804	0.085 ***	-0.081 ^^^	-0.173 ^^^	-0.169	Stress	109,836	0.101 ****	0.366 ****· ^^^	0.356 ****· ^^^	0.823 ****
		(0.033)	(0.076)	(0.120)	(0.117)			(0.027)	(0.086)	(0.109)	(0.105)
Worry	108,809	0.048 ^^	0.168 **· ^^^	-0.011	0.205	Worry	109,836	0.152 ****· ^^	0.564 ****· ^^^	0.162	0.878 ****
		(0.032)	(0.075)	(0.131)	(0.128)			(0.026)	(0.088)	(0.121)	(0.117)

Table 8 (continued)

Bottom MSA median-income quartile					
BPL	109,686	0.914 ****· ^^	-0.211 ^^^^	0.406	1.109
		(0.127)	(0.322)	(0.700)	(0.692)
Enjoyment	109,478	0.080 ****	0.024 ^^^^	-0.342 ***	-0.237 **
		(0.024)	(0.059)	(0.116)	(0.114)
Happiness	109,424	0.045 **	0.005 ^^^^	-0.261 **	-0.211 **
		(0.022)	(0.050)	(0.104)	(0.102)
Stress	109,555	0.033	0.078	-0.212 ^^	-0.101
		(0.032)	(0.073)	(0.142)	(0.138)
Worry	109,554	0.012 ^^^^	0.137 *· ^^	-0.258 ^^	-0.110
		(0.031)	(0.079)	(0.166)	(0.164)
High education					
BPL	202,823	0.968 ****· ^	-0.987 ****	-0.595	-0.614
		(0.078)	(0.269)	(0.470)	(0.466)
Enjoyment	202,572	0.050 ****	-0.076	-0.262 ****	-0.288 ****
		(0.015)	(0.047)	(0.067)	(0.066)
Happiness	202,511	0.036 ***	-0.119 ***	-0.170 ***	-0.254 ****
		(0.013)	(0.040)	(0.058)	(0.056)
Stress	202,660	0.102 ****	0.251 ****· ^^	0.073	0.427 ****
		(0.020)	(0.062)	(0.091)	(0.088)
Worry	202,675	0.150 ****· ^^^^	0.321 ****	0.147 ^^	0.619 ****
		(0.020)	(0.063)	(0.108)	(0.106)
Married					
BPL	238,334	0.903 ****	-1.110 ****· ^^^^	-0.589	-0.796 *
		(0.079)	(0.247)	(0.474)	(0.466)
Enjoyment	237,992	0.020	-0.129 ***· ^^^	-0.192 ***· ^	-0.301 ****
		(0.015)	(0.043)	(0.067)	(0.065)
Happiness	237,976	0.027 **	-0.109 ***	-0.181 ***	-0.263 ****
		(0.014)	(0.038)	(0.059)	(0.057)
Stress	238,103	0.070 ****	0.193 ****	0.126	0.389 ****
		(0.020)	(0.054)	(0.093)	(0.089)
Worry	238,148	0.115	0.353 ****· ^	0.129	0.597 ****
		(0.020)	(0.058)	(0.111)	(0.108)
Top MSA median-income quartile					
BPL	112,509	1.281 ****· ^^	-2.319 ****· ^^^^	-0.702	-1.740 ***
		(0.111)	(0.472)	(0.520)	(0.564)
Enjoyment	112,290	0.043 **	-0.317 ****· ^^^^	-0.189 **	-0.463 ****
		(0.021)	(0.081)	(0.084)	(0.091)
Happiness	112,254	0.019	-0.281 ****· ^^^^	-0.136 *	-0.398 ****
		(0.019)	(0.064)	(0.075)	(0.077)
Stress	112,363	0.104 ****	0.260 ***	0.206 **· ^^	0.570 ****
		(0.028)	(0.088)	(0.100)	(0.100)
Worry	112,406	0.160 ****· ^^^^	0.480 ****· ^^	0.146 ^^	0.786 ****
		(0.027)	(0.114)	(0.122)	(0.133)
Low education					
BPL	96,035	0.675 ****· ^	-0.451	-0.347	-0.124
		(0.134)	(0.322)	(0.558)	(0.542)
Enjoyment	95,722	0.042	-0.149 **	-0.280 ****	-0.387 ****
		(0.026)	(0.059)	(0.088)	(0.085)
Happiness	95,672	0.001	-0.182 ****	-0.198 ***	-0.379 ****
		(0.023)	(0.051)	(0.077)	(0.074)
Stress	95,860	0.037	0.072 ^^	-0.001	0.109
		(0.035)	(0.078)	(0.119)	(0.114)
Worry	95,885	0.018 ^^^^	0.337 ****	-0.098 ^^	0.257 **
		(0.034)	(0.078)	(0.132)	(0.127)
Not married					
BPL	199,514	1.042 ****	0.101 ^^^^	-0.881 *	0.262
		(0.084)	(0.264)	(0.482)	(0.477)
Enjoyment	199,058	0.045 ***	-0.002 ^^^	-0.308 ****· ^	-0.264 ****
		(0.016)	(0.047)	(0.070)	(0.069)
Happiness	198,901	0.021	-0.090 **	-0.233 ****	-0.301 ****
		(0.014)	(0.041)	(0.061)	(0.060)
Stress	199,270	0.109 ****	0.080	0.092	0.281 ***
		(0.022)	(0.059)	(0.096)	(0.094)
Worry	199,267	0.112 ****	0.228 ****· ^	0.152	0.491 ****
		(0.021)	(0.062)	(0.113)	(0.111)

Table 8 (continued)

Female						**Male**				
BPL	217,318	0.941 ****	-0.578 **	-0.651	-0.288	BPL	220,530	1.043 ****	-0.559 **	-0.896 *	-0.411
		(0.082)	(0.255)	(0.478)	(0.472)			(0.080)	(0.254)	(0.478)	(0.471)
Enjoyment	216,937	0.021	-0.111 **	-0.250 ****	-0.340 ****	Enjoyment	220,113	0.043 ***	-0.036	-0.238 ****	-0.231 ****
		(0.016)	(0.045)	(0.069)	(0.067)			(0.015)	(0.045)	(0.068)	(0.067)
Happiness	216,869	-0.005 ^^^	-0.129 ****	-0.191 ****	-0.325 ****	Happiness	220,008	0.052 ****·^^^	-0.068 *	-0.221 ****	-0.237 ****
		(0.014)	(0.039)	(0.060)	(0.058)			(0.014)	(0.039)	(0.060)	(0.058)
Stress	217,084	0.030 ^^^^	0.217 ****·^^	0.119	0.366 ****	Stress	220,289	0.146 ****·^^^^	0.075 ^^	0.098	0.319 ****
		(0.021)	(0.056)	(0.095)	(0.092)			(0.021)	(0.056)	(0.094)	(0.091)
Worry	217,098	0.097 ****	0.337 ****	0.145	0.579 ****	Worry	220,317	0.130 ****	0.263 ****	0.126	0.519 ****
		(0.020)	(0.060)	(0.111)	(0.109)			(0.020)	(0.060)	(0.111)	(0.109)
Child(ren) reside in household						**No children reside in household**					
BPL	130,459	0.954 ****	-0.226 ^	-0.440	0.289	BPL	307,389	1.029 ****	-0.706 ***·^	-0.920 **	-0.597
		(0.108)	(0.300)	(0.532)	(0.514)			(0.069)	(0.233)	(0.458)	(0.455)
Enjoyment	130,291	0.049 **	-0.074	-0.265 ****	-0.290 ****	Enjoyment	306,759	0.033 ***	-0.072 *	-0.238 ****	-0.276 ****
		(0.021)	(0.054)	(0.081)	(0.077)			(0.013)	(0.040)	(0.063)	(0.062)
Happiness	130,253	0.044 **	-0.105 **	-0.192 ***	-0.253 ****	Happiness	306,624	0.021 *	-0.097 ***	-0.205 ****	-0.281 ****
		(0.019)	(0.048)	(0.072)	(0.068)			(0.012)	(0.035)	(0.055)	(0.054)
Stress	130,339	0.054 *	0.132 *	-0.047 ^^	0.139	Stress	307,034	0.086 ****	0.150 ***	0.170 **·^^	0.406 ****
		(0.028)	(0.070)	(0.110)	(0.103)			(0.018)	(0.049)	(0.085)	(0.083)
Worry	130,361	0.107 ****	0.355 ****	-0.034 ^^	0.428 ****	Worry	307,054	0.101 ****	0.276 ****	0.192 *·^^	0.569 ****
		(0.027)	(0.072)	(0.125)	(0.120)			(0.017)	(0.054)	(0.105)	(0.104)
Age < 40						**Age > 67**					
BPL	110,598	0.953 ****	0.029 ^^^^	-0.818	0.164	BPL	110,650	0.981 ****	-1.298 ****·^^^^	-1.008 *	-1.325 **
		(0.110)	(0.324)	(0.567)	(0.555)			(0.114)	(0.312)	(0.578)	(0.564)
Enjoyment	110,494	0.037 *	-0.033 ^	-0.247 ***	-0.242 ***	Enjoyment	110,330	0.005	-0.144 ***·^	-0.179 **	-0.318 ****
		(0.020)	(0.055)	(0.085)	(0.082)			(0.021)	(0.053)	(0.087)	(0.084)
Happiness	110,489	0.043 **·^^	-0.096 **·^	-0.190 ***	-0.243 ****	Happiness	110,229	-0.010 ^^	-0.198 ****·^	-0.124 *	-0.332 ****
		(0.018)	(0.049)	(0.073)	(0.070)			(0.019)	(0.047)	(0.075)	(0.072)
Stress	110,526	0.155 ****·^^^	0.055	-0.160 ^^^	0.050	Stress	110,465	0.043 ^^^	0.176 **	0.182 ^^^	0.401 ****
		(0.028)	(0.071)	(0.118)	(0.113)			(0.029)	(0.069)	(0.121)	(0.116)
Worry	110,526	0.162 ****·^^^	0.305 ****	0.055	0.521 ****	Worry	110,479	0.060 **·^^^	0.332 ****	0.251 *	0.644 ****
		(0.027)	(0.077)	(0.128)	(0.125)			(0.028)	(0.074)	(0.131)	(0.127)

Notes: Standard errors in parentheses. All models are estimated using a four-way (individual, ZIP code, MSA, state) cross-effects model with a multilevel mixed-effects linear regression, conditioning on ZIP-code, MSA, and state median income; own income; gender (male or female); race (white, black, Asian, Hispanic); age (and age-squared); marital status (never-married, married, divorced, separated, domestic partner), parental status (child under 18 living in household) & employment status (employed in last seven days); education (less than high school, high school, technical school, some college, college, post-college); and day, month, & year of interview fixed effects. *, **, ***, **** signify the coefficient is statistically significant at p <0.10, 0.05, 0.01, 0.001, respectively. ^, ^^, ^^^, ^^^^signify the coefficients in columns (1) & (5), (2) & (6), or (3) & (7) are significantly different (using a Wald test of the equality of coefficients) at p <0.10, 0.05, 0.01, 0.001, respectively

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