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The Happiness of Cities

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FLORIDA R., MELLANDER C. and RENTFROW P. J. The happiness of cities, *Regional Studies*. This research examines the factors that shape the happiness of cities, whereas much of the existent literature has focused on the happiness of nations. It is argued that in addition to income, which has been found to shape national-level happiness, human capital levels will play an important role in the happiness of cities. Metropolitan-level data from the 2009 Gallup–Healthways Survey are used to examine the effects of human capital on city happiness, controlling for other factors. The findings suggest that human capital plays the central role in the happiness of cities, outperforming income and every other variable.

Happiness Well-being Human capital Income Cities

FLORIDA R., MELLANDER C. and RENTFROW P. J. 城市幸福感，区域研究。多数研究集中于讨论与国家幸福感相关的问题，本研究则关注构成城市幸福感的因素。研究认为，就城市层面而言，除了收入这一同样包含在国家层面的幸福感中的要素外，人力资本水平也将成为城市幸福感的重要影响因素。研究采用 2009 年 Gallup–Healthways 调研中大都市层面的数据，在控制其他影响变量的基础上考察了人力资本对城市幸福感的影响。研究表明，人力资本对于城市幸福感的形成发挥着中心作用，超过了收入以及其他变量的影响力。

幸福感 福利 人力资本 收入 城市

FLORIDA R., MELLANDER C. et RENTFROW P. J. Le bonheur des grandes villes, *Regional Studies*. Cette recherche examine les facteurs qui influencent le bonheur des grandes villes, tandis que beaucoup de la documentation actuelle porte sur le bonheur de la nation. On affirme que le capital humain joue un rôle important dans le bonheur des grandes villes en plus du revenu, qui s'avère influencer le bonheur au niveau national. On emploie des données auprès des zones métropolitaines et qui proviennent de l'enquête Gallup–Healthways de 2009 pour examiner les effets du capital humain sur le bonheur des grandes villes, tout en tenant compte d'autres facteurs. Les résultats laissent supposer que le capital humain joue le rôle central quant au bonheur des grandes villes, dépassant celui du revenu et de tout autre variable.

Bonheur Bien-être Capital humain Revenu Grandes villes

FLORIDA R., MELLANDER C. und RENTFROW P. J. Das Glück von Städten, *Regional Studies*. In diesem Beitrag untersuchen wir die Faktoren, die sich auf das Glück von Städten auswirken, während sich ein Großteil der vorhandenen Literatur auf das Glück von Nationen konzentriert hat. Wir argumentieren, dass zusätzlich zum Einkommen, das den Ergebnissen zufolge das Glück auf nationaler Ebene prägt, für das Glück von Städten das Niveau von Humankapital eine wichtige Rolle spielt. Mit Hilfe von Daten der Gallup–Healthways–Erhebung von 2009 auf Metropolitan-Ebene untersuchen wir die Auswirkungen von Humankapital auf das Glück von Städten unter Berücksichtigung von anderen Faktoren. Die Ergebnisse lassen darauf schließen, dass das Humankapital für das Glück von Städten eine entscheidende Rolle spielt und eine wichtigere Bedeutung als das Einkommen und jede andere Variable besitzt.

Glück Wohlbefinden Humankapital Einkommen Städte

FLORIDA R., MELLANDER C. y RENTFROW P. J. La felicidad de las ciudades, *Regional Studies*. En este estudio examinamos qué factores repercuten en la felicidad de las ciudades, mientras que en la mayoría de la bibliografía existente se ha prestado más atención a la felicidad de las naciones. Sostenemos que además de los ingresos, que se ha observado que determinan la felicidad a nivel nacional, los niveles de capital humano desempeñan un importante papel en la felicidad de las ciudades. Utilizamos datos recabados en una encuesta realizada por Gallup–Healthways en 2009 en un marco metropolitano para examinar los efectos del capital humano

en la felicidad de las ciudades, considerando también otros factores. Los resultados indican que el capital humano desempeña una función central en la felicidad de las ciudades, superando a los ingresos y todas las otras variables.

Felicidad Bienestar Capital humano Ingresos Ciudades

JEL classifications: I0, J24, R0

INTRODUCTION

Much of the debate over happiness or subjective well-being – defined as people's subjective cognitive and affective evaluations of their quality of life – has centred on the role of income. While EASTERLIN's (1974, 1995) cross-national work found that the relationship between income and happiness holds only within and not across countries, more recent work by DEATON (2008) and STEVENSON and WOLFERS (2008) has challenged this view, finding a strong relationship between income and happiness across nations. GRAHAM (2009) offers the paradox of the 'happy peasant and the miserable millionaire' as an important factor to consider here, suggesting that people's expectations often adapt to their income level and financial stability.

The present analysis seeks to shed additional light on the ongoing debate over happiness and well-being by focusing on the metropolitan level. Considering happiness at the metropolitan level is important and interesting; individuals tend actively to select their place of residence in light of the job opportunities, public goods and services they provide (SJAASTAD, 1962; TIEBOUT, 1956), identify closely with and derive both satisfaction with their community (FLORIDA, 2009; FLORIDA and MELLANDER, 2010) and emotional attachment from the city in which they live (FLORIDA and MELLANDER, 2010; FLORIDA *et al.*, 2011). While national-level studies have stressed the connection between happiness and income, drawing from studies of metropolitan economic performance it is argued here that human capital is likely to play a considerable role in metropolitan happiness. This hypothesis is tested through statistical analyses of the effects of human capital on happiness, alongside income, wages and economic output as well as income inequality, unemployment, housing cost and affordability, density, age, commuting time, and climate. The measure employed to assess metropolitan happiness comes from newly available data from a Gallup–Healthways Survey. As far as the authors are aware, it is the first comprehensive dataset that tracks happiness and well-being at the metropolitan level, providing data from a large-scale survey of individuals across 184 metro regions. Data-matching reduces the size of the sample to 170 metros – roughly half of all US regions.

The findings support the hypothesis. Using correlation and regression analysis, this investigation finds that capital is a key determinant of city or metropolitan well-being; and that housing values and unemployment also play a role in metropolitan well-being.

THEORY AND CONCEPTS

The happiness–income connection

Most of the research on place and well-being has focused on national differences (DIENER and DIENER, 1995; DIENER *et al.*, 1995, 2003; DIENER and LUCAS, 1999; INGLEHART and KLINGEMANN, 2003; LYNN and STEEL, 2006; STEEL and ONES, 2002; VEENHOVEN, 1993), and the results have revealed robust national differences in life satisfaction (DIENER, 2000; DIENER *et al.*, 1995; VEENHOVEN, 1993). Explanations for these differences have frequently focused on the relationship between well-being and income. Early research found that the relationship between income and happiness holds within countries, but not between them (EASTERLIN, 1974, 1995). However, more recent research (DEATON, 2008; STEVENSON and WOLFERS, 2008) found a closer connection between happiness and income, suggesting that people with high incomes are happier than those with lower incomes, both in absolute and in relative terms. Certainly one reason why income might be important to life satisfaction is that individuals must meet their basic needs for food, water, and shelter in order to survive. Another reason may be that wealth affords people opportunities and experiences to enrich their lives.

While income levels matter for happiness, work by GRAHAM (2008) shows the relationship between the two is relative. Graham contends that although people can be happy at lower levels of income, they are far less happy when there is greater uncertainty over their future wealth. This suggests that the income–happiness link is based not only on individual perceptions, but also on social and economic context.

The role of human capital

Both individual-level and cross-national studies have found that human capital plays, at best, a small role in happiness and well-being. A meta-analysis by WITTER *et al.* (1984) found that education is a small but positive contributor to subjective well-being in adults, accounting for 1–3% of the variance. LAYARD (2005) found that education has a small (but significant) direct effect on happiness and that it also affects happiness indirectly by raising personal income. Curiously, there is some evidence that better-educated individuals report greater dissatisfaction than their less-educated counterparts, so the relationship cannot simply be seen as higher education equals more happiness. DIENER *et al.* (1999)

suggest the diminishing returns of education to well-being may be the result of education raising people's goals and aspirations to a point that is very challenging to achieve, and therefore distressing.

While the links between human capital and well-being do not operate strongly at the individual level, there is evidence for a stronger relationship at aggregate levels of analysis. Using a measure of well-being derived from the Gallup–Heathways survey, RENTFROW *et al.* (2009) found a close correlation between human capital and happiness at the state level. More recently, LAWLESS and LUCAS (2010) examined the effects of human capital as well as other variables on subjective well-being across US counties. Their measure of subjective well-being was based on state surveys of life satisfaction collected by the Centers for Disease Control and the Prevention Behavioral Risk Factor Surveillance System. They found a strong association between human capital and life satisfaction at the county level. While the findings of these two studies are encouraging, they are based on bivariate analysis only, and did not control for the effects of income and other factors in a multivariate context. The present investigation goes beyond these previous studies by explicitly testing for the effects of human capital on happiness through a series of regression models that control for the effects of income and other key economic factors.

Other factors that contribute to happiness and well-being

This research considers a number of factors that the literature identifies as influencing happiness and well-being at the individual and/or national levels. Building on theoretical and empirical work in the urban and regional literature, this investigation includes variables that have been identified as potential predictors of metropolitan-level economic performance and/or community satisfaction.

Income inequality. GLAESER *et al.* (2009) found that people in unequal communities are more likely to report lower levels of happiness compared with residents in communities with lower levels of inequality. CLARK and OSWALD (1996) also found that workers are sensitive to their relative (or comparison) wage level. STUTZER (2004) posited that current income compared with aspired income accounts for some of the variance in happiness. These findings suggest that relative income might be a better predictor of happiness than absolute income.

Unemployment. Several studies in economics have probed the relationship between unemployment and happiness (CLARK and OSWALD, 1994; CLARK *et al.*, 2001; WINKELMANN and WINKELMANN, 1998). BLANCHFLOWER and OSWALD (2004), for instance, found a negative relationship between unemployment

and happiness at the individual level. LAWLESS and LUCAS (2010) found a sizeable negative correlation between unemployment and happiness at the county level.

Commuting. Commuting time has been found to have a significant negative effect on happiness and well-being. KRUEGER *et al.* (2008) found the second most unpleasant activity of the day to be a long commute to work. STUTZER and FREY (2008) also found that people with longer daily commutes reported systematically lower subjective well-being. LAWLESS and LUCAS (2010) found commuting time to be negatively associated with happiness at the county level, although the correlation was relatively weak compared with other factors in their analysis.

Housing. Housing is the single biggest cost factor for most individuals and households. It might be expected that happiness is higher in places where housing is more available, less expensive and more affordable. However, RENTFROW *et al.* (2009) found happiness to be associated with higher median housing values at the state level. LAWLESS and LUCAS (2010) found mixed results for housing variables. Like RENTFROW *et al.* (2009), they found housing costs to be significantly related to happiness, although at a weaker level than for human capital or income. However, they found negative correlations for indicators that measure housing prices as a percentage of income, such as the percentage of people whose mortgage or rent exceeds 35% of income. They also found negative correlations for housing cost variables – including housing value, median mortgage and media rent – when they used partial correlations for median household income.

The urban economics and regional science literatures (ALBOUY, 2008, 2009; FLORIDA and MELLANDER, 2010; GLAESER *et al.*, 2001; GYOURKO *et al.*, 2006) found that housing costs are somewhat of a proxy for higher levels of amenities and a generally higher quality of life. Thus, housing costs may accompany other attributes that positively affect happiness and well-being. Campbell and colleagues (CAMPBELL and CONVERSE, 1972; CAMPBELL *et al.*, 1976) suggest that the objective character of housing is less important than the degree to which housing conditions meet aspirations. Furthermore, the comparison between where one currently lives and the best place one lived previously appears to be more important than the difference between one's current housing compared with that of others.

Several studies suggest other factors affecting the relationship between housing and life satisfaction (CARP, 1975; CATTANEO *et al.*, 2007; KOZMA and STONES, 1983; MICHALOS, 1982). The link between housing satisfaction and well-being appears to vary in urban and rural contexts. For example, KOZMA and STONES (1983) found that housing satisfaction was a

significant predictor of happiness for urbanites, but not for rural dwellers. MITCHELL's (1971) research on high-density housing in Hong Kong, China, found that the link between housing and happiness is not driven by housing per se, but by the factors that tend to accompany high-density housing in the neighbourhood, such as dirty and crowded street environments that are socially unhealthy for communities.

Density. According to various studies, the effects of density on happiness are mixed. BELL (1992) points out that around the world there is a fairly consistent belief that less dense communities provide a higher quality of life than urban living. LAWLESS and LUCAS's (2010) county-level study finds that life satisfaction is higher in counties with smaller and less dense populations. PUTNAM (2000) found higher levels of social capital in rural and suburban areas compared with larger, more diverse urban areas. DAVIS and FINE-DAVIS (1991) found that rural dwellers in Ireland were more satisfied with life than were those in urban areas. Life satisfaction was related to a more relaxed, less pressured way of life – although this finding could also be a function of lower expectations. RICHMOND *et al.* (2000) found that respondents with 1 acre or more of land around their home reported greater satisfaction with their area and community compared with residents with less land. On the other hand, CRIDER *et al.*'s (1991) research in rural Pennsylvania, USA, found that rural location was only marginally associated with community satisfaction and there was no strong relationship between place of residence and happiness.

Age. Recent research on subjective well-being has identified a 'U'-shaped relationship between well-being and age, with well-being being high among young and older adults, and lower among middle-aged adults (BLANCHFLOWER and OSWALD, 2008; DEATON, 2008). Most studies of national differences in well-being have not reported relationships between the average age of citizens and well-being, so it is not clear whether the age of citizens relates in any way to happiness. On the one hand, metropolitan areas with younger residents may be higher in well-being because younger people experience fewer health problems compared with older adults. On the other hand, it is conceivable that areas with more older adults are wealthier and therefore healthier and happier (WILKINSON, 1992) compared with areas with fewer young people.

Climate. Conventional wisdom suggests that happiness is related to climate and weather – specifically, that people are happier in warmer and sunnier places. The findings of the research literature are more mixed. In an investigation of temperature and happiness in sixty-seven countries, REHDANZ and MADDISON (2005) found that high average temperatures in the coldest

month were positively associated with happiness, while high mean temperatures during the hottest month were negatively associated with happiness. These findings are consistent with work of KELLER *et al.* (2005), which found that pleasant weather in spring was associated with a positive effect, but warm weather in summertime was negatively associated with positive effect. One hypothesis for these findings is that during the cold months and early spring, people have been deprived of nice weather and spent much of their time indoors, so seeing the sun and being able to spend time outside comfortably in spring is more appreciated.

SCHKADE and KAHNEMAN (1998) found that people believed the weather to be better, on average, in California than in the Midwest, and thus expected California residents to be happier than people living in the Midwest. However, while Californians were indeed more satisfied with their climate than were Midwesterners, self-reported overall life satisfaction was the same in both California and the Midwest, suggesting that weather may not have a consistent effect on well-being. MUESER and GRAVES (1995) posited that as societies become richer, people are willing to sacrifice their personal income to live in more pleasant, sunnier climates.

Even though the academic literature provides only limited evidence of the view that climate is associated with happiness, the popular belief persists that people who live in warmer, sunnier climates tend to lead happier lives.

Summary

National and individual-level research has found a close association between income and happiness, but only a small role for human capital. Studies of metropolitan economic performance have found that human capital is a strong predictor of regional economic outcomes including incomes. Moreover, recent state- and county-level studies have found that human capital is associated with happiness at those geographic scales. The present investigation aims to inform one's understanding of geographical differences in happiness by determining the role of human capital when controlling for income and other key economic factors that have been found to be important to life satisfaction across US metropolitan areas, which comprise economically integrated and meaningful geographic units.

Variables, data and methods

Next, a series of statistical techniques are used to examine the relationships between human capital and happiness across metropolitan areas, while controlling for the effects of income and other key economic factors. This section outlines the major variables, data sources and methods used in these analyses.

Dependent variable

Well-being index. The dependent variable is a multifaceted variable for well-being. It is based on the Gallup–Healthways Well-being Index. It ranges from a low of zero to a high of 100 and consists of six sub-indices for life evaluation, emotional health, work environment, physical health, healthy behaviours, and access to basic needs. The telephone survey was conducted by the Gallup Organization and tracked US residents between 2 January and 29 December 2009. It includes 353 000 individuals; and covers 184 US metropolitan regions. The maximum expected error varies based on metro size, ranging from less than 1% in larger cities with more than 1 million population to 3.1% for the smallest metros. Data are only available for the overall well-being index and not for the sub-indices on which it is based.¹

Independent variables

The analysis employs a range of independent variables:

Human capital. The central hypothesis is that there is a strong association between human capital and happiness at the metropolitan scale. Human capital has been found to be strongly associated with metropolitan level economic performance. The variable used for human capital is the standard one: the share of the labour force with a bachelor's degree or above. The data are from the 2006 US Census.

Income measures. Three variables were used to capture the effects of income on material well-being:

- *Income* is the sum of the amounts reported separately for wage or salary income including net self-employment income; interest, dividends, or net rental or royalty income or income from estates and trusts; social security or railroad retirement income; Supplemental Security Income (SSI); public assistance or welfare payments; retirement, survivor, or disability pensions; and all other income. It is measured on a per capita basis and is from the 2005 US Census.
- *Wage income* is a narrower measure and covers total money earnings received for work performed as an employee in the region. This measure includes wages, salary, armed forces pay, commissions, tips, piece-rate payments, and cash bonuses earned before deductions were made for taxes, bonds, pensions, union dues, etc. It is measured on a per worker basis and is gathered from the from the Bureau of Labor Statistics for 2006.
- *Gross regional product* is a measure of the value of regional production and is a reflection of regional productivity levels, but also a regional standard of living. The variable used here is calculated on a per capita basis using data from the 2005 US Census.

Income inequality. The measure of income inequality used was the standard Gini coefficient of inequality in household incomes. The data were from the Census' American Community Survey for 2006–2008.

Unemployment. Two measures of unemployment were employed:

- *Unemployment rate*, that is, the share of the labour force without employment. The data are for December 2009.
- *Change in unemployment* measures the share of the labour force that was unemployed between December 2008 and December 2009. Both are from the Bureau of Labor Statistics.

Housing. Three measures were used for housing:

- *Housing cost* measures the median values of owner-occupied housing units for 2009. The data are from the American Community Survey.
- *Housing affordability* is a ratio of housing costs (median housing value) to wages. The wage data were from the Bureau of Labor Statistics for 2006; the housing cost data were from the American Community Survey.
- *Homeownership share* is the share of the owner-occupied housing units. The data source is the American Community Survey for 2006–2008.

Density. The measure of density is population per square kilometre. The data are from the 2006 US Census.

Age structure. This is the population median age taken from the American Community Survey, US Census Bureau, for 2006–2008.

Average commute time. This was the average commuting time to work; the source was the American Community Survey from the US Census Bureau for 2006–2008.

Climate. Three climate variables were employed: average temperature in January, in July, and the difference between the two (to capture temperature stability around the year). The data were from the US Geological Survey.

Table 1 presents the descriptive statistics for all variables.

Appendix A provides descriptive statistics for the US metropolitan regions that are not included in this analysis due to missing values, mainly associated with the coverage of the Gallup–Healthways Well-being Index. The Gallup–Healthways metros have higher mean values for income, wage income and gross regional product per capita, higher human capital levels, greater inequality, lower rates of unemployment, higher housing values, and higher densities than the metros with missing

Table 1. Descriptive statistics

	<i>n</i>	Minimum	Maximum	Mean	Standard deviation
Well-being	184	59.50	72.50	65.897	2.123
Human capital	170	0.09	0.32	0.170	0.040
Gross regional product per capita	170	19 828	86 069	48 502	12 369
Income	170	20 837	69 118	41 531	7 422
Wages ^a	170	32 639	72 277	44 841	5 639
Income inequality	184	0.395	0.543	0.447	0.023
Median housing value ^b	184	76 000	638 300	203 470	102 866
Housing-to-wage ratio	170	1.93	14.19	4.526	2.487
Homeownership share	171	0.519	0.817	0.678	0.052
Unemployment	184	4.10	17.50	9.663	2.655
Unemployment change	184	0.40	5.00	2.50	0.979
Population density	170	5.16	1020.34	143.29	146.68
Age	171	24.4	46.8	36.58	3.31
Commute time	171	19.61	37.88	25.20	3.46
January temperature	181	9.40	66.50	36.89	12.18
July temperature	181	61.80	91.15	75.29	5.58
Temperature stability	181	11.40	59.64	38.40	10.14
Valid <i>n</i> (list-wise)	170				

Notes: ^aExpressed in thousands of US dollars in the regression analysis.

^bExpressed as 100 000 of US dollars in the regression analysis.

values. The two sets of metros differ little in temperature or climate.

Methods

A variety of statistical methods were used. First, bivariate correlation analyses were conducted to identify relationships between well-being and key economic and social factors. Second, partial correlations were run, controlling for the effects of the income measures. Finally, multivariate ordinary least-squares (OLS) regression analysis was used to examine the effects of human capital on happiness, controlling for income measures and other factors.

Findings

To orient the analysis, Fig. 1 provides a map of the variation in happiness across US metro areas.

Overall, the difference between the highest and lowest well-being scores revealed no dramatic disparities between American cities. The lowest score is 59.5 for Fort Smith, Arkansas–Oklahoma, while the highest is 72.5 for Boulder, Colorado. Nonetheless, the map illustrates that there is significant variation between regions. In general, the happiest (black) regions tend to be part of the large mega-regions near the coasts, including Seattle and Portland (Cascadia), parts of the Bay Area (Nor-Cal) and Greater Los Angeles (So-Cal), and Boston and Washington (Bos-Wash). Cities in the Midwest and Texas typically scored near the middle of the well-being scale, while Florida and some parts of the South displayed considerably lighter shades, suggesting relatively low scores. In general, dramatic variation

between adjacent regions is rare, suggesting that proximity matters somewhat to the happiness of regions.

Correlation analysis

Table 2 summarizes the results of the bivariate correlations among the key measures. Since previous research (STEVENSON and WOLFERS, 2008) found a significant relationship between income and well-being at the national level, partial correlations were run, controlling for the effects of income on happiness using the best-performing measure of income or material well-being: wage income.

Human capital. The correlation analysis provides partial confirmation of the core hypothesis. It finds a strong, positive and significant correlation with metropolitan well-being. In fact, the correlation between the two is the highest of any variable in the analysis (0.681). The correlation between human capital and happiness remains the strongest among all variables when partial correlations controlled for the effects of wage levels (0.582) were run. Fig. 2 is a scatter-graph of the relationship between human capital and well-being. The line is steep and the fit is good.

Income. The correlations for the main income measures – average income, wages and output per capita – are significant, but weaker than for human capital. The strongest correlation is for wage income (0.450) followed by income (0.403), and then gross regional product or economic output per capita (0.372). Wage income is also the control variable in the partial correlations above. Fig. 3 illustrates the

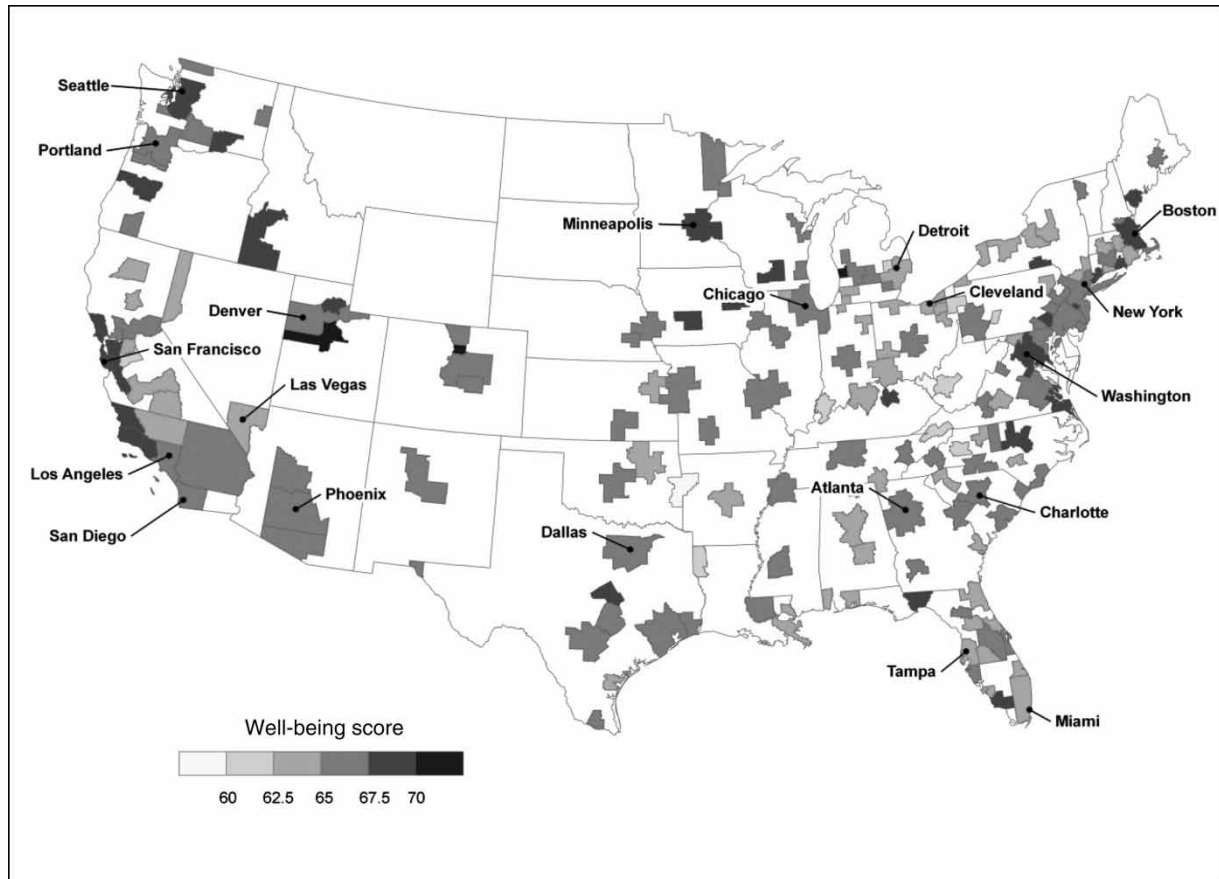


Fig. 1. Well-being for 184 US metropolitan regions

bivariate relationship between wages and well-being. The fitted line is not as steep as the one for human capital above.

Table 2. Correlation analysis findings for metropolitan well-being

	Bivariate correlation	Partial correlation controlling for average wage
Gross regional product per capita	0.372***	n.a.
Income	0.403***	n.a.
Wages	0.450***	n.a.
Human capital	0.681***	0.562***
Income inequality	-0.040	-0.012
Median housing value	0.494***	0.301***
Housing-to-wage ratio	0.483***	0.388***
Homeownership	-0.187**	-0.053
Unemployment	-0.344***	-0.305***
Change unemployment	-0.300***	-0.248***
Density	0.088	-0.195**
Age	-0.290***	-0.298***
Commute time	0.083	-0.161**
January temperature	-0.018	0.081
July temperature	-0.217***	-0.024
Temperature stability	-0.098	-0.108

Note: *Statistically significant at the 0.01 level; **statistically significant at the 0.05 level; and ***statistically significant at the 0.01 level.

Income inequality. Metropolitan-level happiness is not associated with income inequality. Correlations of -0.040 in the bivariate correlation and -0.012 in the partial correlation were found.

Unemployment. Unemployment is significantly related to metropolitan-level happiness. The correlations to the two unemployment variables are negative and significant: -0.344 for the unemployment rate and -0.300 for the annual change in unemployment. These correlations remain significant when partial correlations controlling for wage levels, at -0.305 and -0.248 , were run. Fig. 4 shows the relationships between well-being and unemployment and changes in unemployment.

Housing. Housing values are also significantly correlated with metropolitan well-being (0.494), and stay significant also when wages are partialled out (0.301). The measure for housing affordability – the housing value-to-wage ratio – is also significantly associated with metropolitan happiness (0.483), and remains significant in the partial correlation (0.388). Homeownership is negatively and significantly associated with metropolitan happiness, but becomes insignificant when controlling for regional wages. Fig. 5 plots the relationship between well-being and median housing values, as well as between well-being and housing-to-wage ratio.

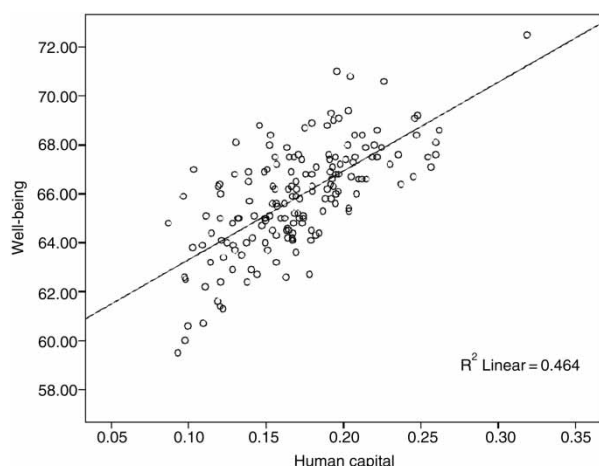


Fig. 2. Human capital and well-being

Density. Density is not correlated with metropolitan-level happiness, but the correlation is significant and negative (-0.195) when controlled for wages. In other words, more dense places are related to lower levels of happiness when wages are controlled for.

Age. The median age of the population is significant and negatively related to happiness (-0.290). In other words, younger places are happier places. This relation even becomes slightly stronger when one controls for wage (-0.298).²

Commute time. Commute time is not associated with metropolitan happiness, but when controlled for wages the correlation is negative and significant (-0.161).

Climate. The results for the climate variables suggest that climate does not play a role in metropolitan happiness. The correlations are insignificant for two climate variables: January temperature and temperature stability. The third variable, July temperature, is negatively and

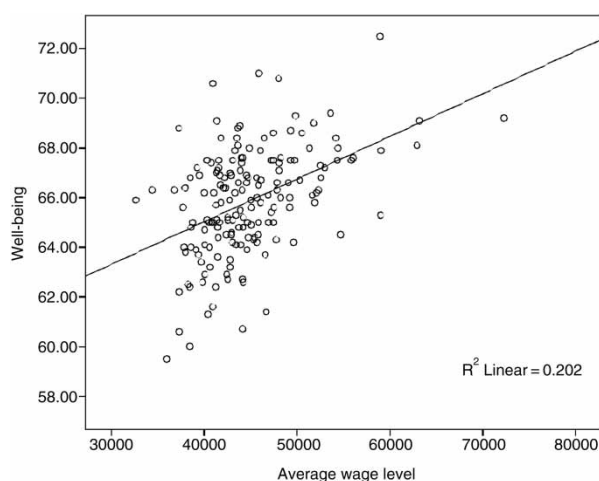


Fig. 3. Wage income and well-being

significantly related to metropolitan happiness (-0.217), though this relationship becomes insignificant when wages are controlled for.

Regression findings

Next are the findings of the regression analysis. Only those variables that were statistically significant in the correlation analysis are included, while those that were insignificant are removed. Given the nature of the variables, one would expect to find some collinearity. Thus, several regressions were run, substituting variables that correlate strongly with one another. Variance inflation factor (VIF) value tests were also run to control for possible multicollinearity effects.

The first model examines the relationship between metro-level happiness and income, since earlier research suggests a close connection between the two in cross-national and individual levels studies. It includes the best performing measure of regional 'income' – wage income – from the previous correlation analysis. Other key economic measures that were significant in the correlation analysis are also included. These include two measures for unemployment – unemployment rate and change in the unemployment rate – and two measures for housing: median housing value and the housing value-to-wage ratio. Table 3 summarizes the results for these regressions.

The first version of the model (equation 1.1) examines how much of the variation is explained by wage income alone. R^2 is 0.20, suggesting that wage income on its own explains roughly 20% of the variation in well-being. The second version of the model (equation 1.2) adds the unemployment variables. R^2 for this model increases slightly to 0.292. The relatively high VIF values show that there is strong collinearity between the two unemployment variables shown by the relatively high VIF values. Still, the unemployment rate variable – that is, the variable for the absolute level of unemployment – shows a relatively stronger relationship to metropolitan happiness than change in the unemployment rate. The third version of the model (equation 1.3) includes the two housing variables alongside wage income. R^2 here is 0.328, just slightly better than equation (1.2) for just wage income in combination with unemployment, and approximately 0.13 more than if wage income alone is used. Again, note the strong collinearity between these housing variables which generate VIF values between 54 and 78. That said, the housing affordability measure (housing cost to wages) is the stronger measure of the two. The fourth version of the model includes wage income alongside the best-performing unemployment and housing variables. This model (equation 1.4) generates an R^2 of 0.398, which is the best performing of all the models, explaining roughly 40% of the variation.

The first model above sets up a second model which also includes human capital alongside wage income.

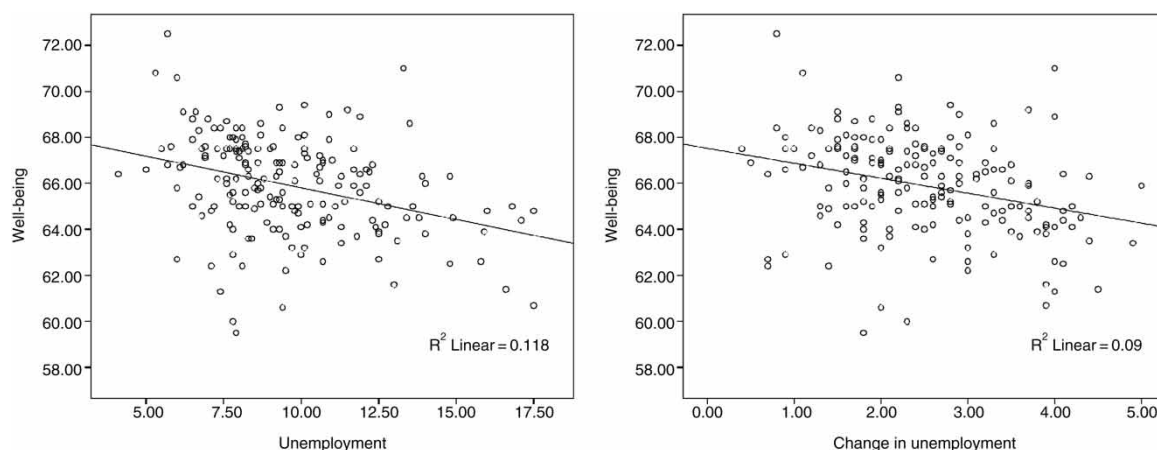


Fig. 4. Unemployment, change in unemployment and well-being

Also included are the best-performing housing and unemployment variables, as well as commuting time and density (which were positive and significant in the partial correlation analysis) as control variables. Table 4 summarizes the results of these models.

The first version of the model (equation 2.1) examines how much of the variation is explained by human capital alone. The regression generates an R^2 of 0.464, implying that human capital alone explains almost half of metropolitan happiness. This is more than double that of the wage-income model above (equation 1.1). The second model (equation 2.2) adds the variables for wage income, unemployment level, housing cost to wages and also age. The model generates an even higher R^2 of 0.578, and human capital remains the strongest variable. Human capital is excluded from the next model (equation 2.3) and the regression is rerun. This regression generates an R^2 of 0.482, smaller than for equation (2.2) and just slightly more than equation (2.1). The fourth model (equation 2.4) puts human capital back in, in place of the wage income variable. This version of the model generates an R^2 of 0.578. Human capital thus adds significantly more explanatory

power to well-being than the best-performing measure of income – wage levels income. Note, however, that this model (equation 2.4) adds approximately only 0.11 in additional explanatory power to the R^2 value beyond the initial model (equation 2.1), which was for human capital alone. Clearly, human capital is the strongest-performing variable in this series of models explaining metropolitan well-being and happiness.

Taken together, the multivariate regression results show the significant impact of human capital on metropolitan happiness. The best-performing measure of income – wages – is also significant, but it does not perform as well as human capital. Furthermore, a wide body of research in urban economics (GLAESER *et al.*, 1992; GLAESER and MARÉ, 2001; RAUCH, 1993) finds that human capital levels are the key predictor of income to begin with.

Unemployment is also a significant factor: regions with lower levels of unemployment have significantly higher levels of happiness. Housing costs are also significantly associated with happiness,³ but interestingly happiness is higher in metropolitan areas where housing is less affordable. While this may seem counterintuitive

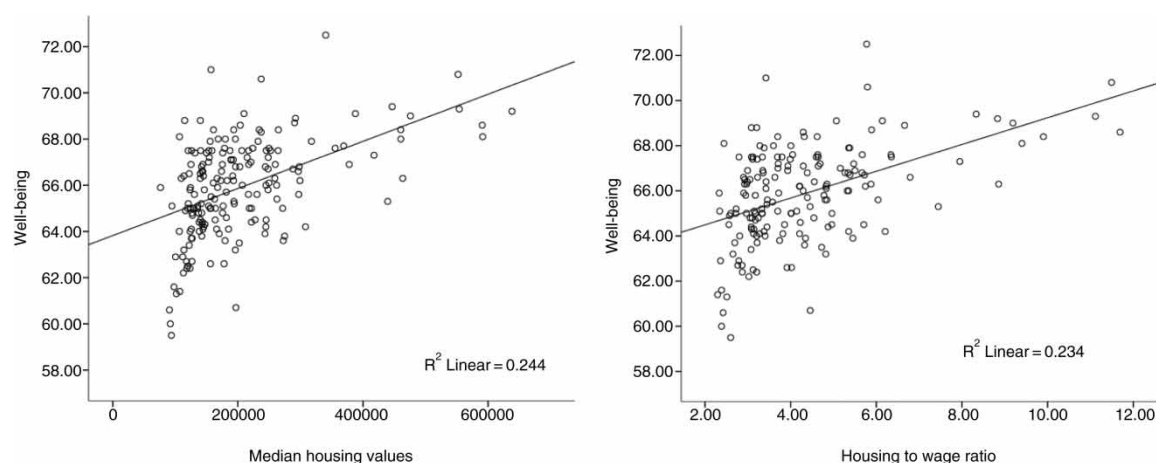


Fig. 5. Housing values, housing-to-wage ratio and well-being

Table 3. Regression findings for wage income, unemployment, and housing variables

	Equation (1.1)	Equation (1.2)	VIF	Equation (1.3)	VIF	Equation (1.4)	VIF
Constant	58.148*** (1.191)	60.839** (1.277)		50.991*** (3.044)		62.294 (1.294)	
Wage income	0.172*** (0.000)	0.163*** (0.000)	1.006	0.284*** (0.067)	7.531	0.092*** (0.027)	1.332
Unemployment rate		-0.201* (0.081)	2.392			-0.261** (-0.049)	1.013
Change in unemployment		-0.136 (0.222)	2.386				
Housing value				-0.035*** (0.012)	78.213		
Housing-to-wage ratio				2.084*** (0.577)	54.490	0.463*** (0.085)	1.326
R ²	0.202	0.292		0.328		0.398	
R ² adjusted	0.197	0.279		0.315		0.387	
n	169	169		169		169	

Note: VIF, variance inflation factor.

at first, research in urban economics (ALBOUY, 2008, 2009; FLORIDA and MELLANDER, 2010; GLAESER *et al.*, 2001; GYOURKO *et al.*, 2006) finds that metropolitan housing prices reflect a combination of productivity and quality-of-life amenities. Accordingly, one would expect higher housing prices and higher housing price-to-wage ratios in places that are more economically productive and offer higher levels of amenities and quality of life, two factors that are likely to affect happiness and subjective well-being. In these regions, individuals are willing and able to pay more for these housing-related attributes, which in turn affect happiness. A significant and negative relationship is also found between age structure and happiness. Younger cities are happier cities. This investigation also finds that a number of factors thought to affect metropolitan, city or community-level happiness – density and commute time – do not appear to play a statistically significant role in metropolitan-level happiness. It is worth noting, however, that some of the variables (change in unemployment and housing values) excluded from the regression analyses due to collinearity problems are associated with housing affordability and levels of unemployment, both of which were significant in the multivariate regression analysis.

CONCLUSION

The present research examined the factors that influence happiness at the metropolitan level. The metropolitan

level is important since individuals actively seek out locations, identify with their place of residence, and derive considerable satisfaction as well as emotional attachment from them. While previous cross-national research (DEATON, 2008; DIENER, 1984; DIENER and DIENER, 1995; EASTERLIN, 1974, 1995; STEVENSON and WOLFERS, 2008) focused on the effects of income and observed that human capital accumulation plays only a limited role in national-level happiness, the present authors hypothesized that human capital would play a significant role in happiness at the metropolitan level, given its strong role in shaping metropolitan economic and social outcomes. The hypothesis was tested using new data from a large-scale Gallup–Healthways survey of happiness and well-being across 170 metropolitan areas. Correlation analyses were conducted, including partial correlations to control for wage levels, and regression analysis to probe for the effects of human capital on metropolitan-level happiness, alongside income and related measures of economic performance, unemployment, income inequality, housing cost and affordability, density, age structure, commuting time, and climate, which are thought to effect happiness.

Overall, the findings confirmed the human capital and happiness hypothesis. Specifically, the analysis shows that human capital plays a key role in metropolitan-level happiness and well-being, more so than income wages or other variables. This is in line with previous studies at the state (RENTFROW *et al.*, 2009) and

Table 4. Human capital regression results

	Equation (2.1)	Equation (2.2)	VIF	Equation (2.3)	VIF	Equation (2.4)	VIF
Constant	59.677*** (0.527)	66.017*** (1.887)		67.681*** (2.065)		66.012*** (1.794)	
Average wage level		0.000 (0.033)	2.906	0.128*** (0.029)	1.740		
Unemployment		-0.073 (0.049)	1.422	-0.227*** (0.048)	1.043	-0.074** (0.047)	1.351
Housing-to-wage ratio		0.394*** (0.075)	1.423	0.491*** (0.084)	1.359	0.394*** (0.074)	1.396
Human capital	36.292*** (3.009)	27.727*** (4.546)	2.799			27.705*** (3.507)	1.676
Population density		0.001 (0.001)	1.823	-0.002 (-0.002)	1.814	-0.001 (0.001)	1.692
Age		-0.119*** (0.035)	1.048	-0.146*** (0.038)	1.032	-0.119*** (0.035)	1.048
Commute time		-0.053 (0.042)	1.782	-0.076 (-0.047)	1.767	-0.053 (0.041)	1.695
R ²	0.464	0.578		0.482		0.578	
R ² adjusted	0.461	0.560		0.463		0.563	
n	169	169		169		169	

Note: VIF, variance inflation factor.

the county levels (LAWLESS and LUCAS, 2010). Furthermore, a wide body of research in urban economics (GLAESER *et al.*, 1992; GLAESER and MARÉ, 2001; RAUCH, 1993) finds that human capital levels are the key predictor of income. Unemployment is also a significant factor: regions with lower levels of unemployment have significantly higher levels of happiness. Housing costs are significantly associated with happiness, but interestingly happiness is higher in metropolitan areas where housing is less affordable. While this may seem counterintuitive at first, research in urban economics (ALBOUY, 2008, 2009; FLORIDA and MELLANDER, 2010; GLAESER *et al.*, 2001; GYOURKO *et al.*, 2006) finds that metropolitan housing prices reflect a combination of productivity and quality-of-life amenities. Accordingly, one would expect higher housing prices and higher housing price-to-wage ratios in places that are more economically productive and also offer higher levels of amenities and quality of life, two factors that are likely to affect happiness and subjective well-being. In these regions, individuals are willing and able to pay more for housing-related attributes, which in turn affect happiness. The inverse relationship between metropolitan-level well-being and age is likely because areas with more young people are generally healthier compared with places with more older adults.

This statistical analysis also finds that a number of factors that have been thought to affect metropolitan, city or community-level happiness, such as density and commute time, do not appear to play a statistically significant role in metropolitan-level happiness. Density is not correlated with metropolitan-level happiness, and the correlation is negative and significant (-0.195) when controlling for wages. That is, more dense places appear to generate lower levels of happiness when wages are held constant. While numerous studies have found commute time to be among the factors that contribute to low levels of happiness, commute time is not significant in the regressions here, and it is not significantly associated with happiness in the correlation analysis. It is, however, negatively (though weakly) associated with happiness when partial correlations are run that control for wage levels. While some continue to believe people are happier in warmer and sunnier places, the present results do not support that claim. The correlation results for the three climate variables suggest that climate does not play a role in metropolitan happiness. The correlations are statistically non-significant for two climate variables: January temperature and temperature stability. The third variable, July temperature, is negatively and significantly related to metropolitan happiness, though this relationship is eliminated when wages are partialled out.

More broadly, the results from this investigation suggest that the effect of income on happiness at the metropolitan level is driven more by human capital than by income. Not only does human capital significantly affect income, but also it affects a number of

variables associated with well-being, such as a sense of control over life, stable and supportive relationships, and occupational resilience. Human capital thus influences several important life domains and its effects can be observed at the metropolitan level.

Higher levels of human capital are associated with better employment opportunities and greater employment options. JUDGE *et al.* (2001) found that individuals with a college degree not only have more occupational opportunities, but also engage in more challenging, stimulating and satisfying work. Education gives people access to non-alienating paid work and economic resources that, along with schooling itself, increase the sense of control over life and explains much of education's positive effects on psychological well-being. Human capital is also closely associated with unemployment. College-educated adults in the United States face levels of unemployment that are markedly lower than those for high-school graduates and even more so for individuals without high-school degrees. Compared with people without a college degree, college-educated adults also tend to have higher-level and more flexible skills that enable them to switch jobs more readily if laid off, or to find more fulfilling employment if their job becomes less interesting.

Human capital also contributes to people's ability to respond to challenges effectively and to maintain a sense of mastery over the environment. MIROWSKY and ROSS (1989) and ROSS and MIROWSKY (1992) observed a positive relationship between education and sense of control, such that well-educated individuals had a greater sense of personal control than the less-educated, even after adjusting for employment, job autonomy, earning, minority status, age and marital status (BIRD and ROSS, 1993; ROSS and MIROWSKY, 1992). High personal control facilitates the development of effective and flexible coping strategies (MIROWSKY and ROSS, 1989; TURNER and NOH, 1983; WHEATON, 1983).

Furthermore, human capital is positively related to other factors that affect happiness, such as stable social relationships and social support (ROSS and WILLIGEN, 1997). Human capital is associated with more stable marriages and family ties – factors that are closely correlated with subjective well-being. Research has found college-educated adults in the United States (GLENN and SUPANCIC, 1984) and Norway (LYNGSTAD, 2004) have lower levels of divorce and more stable marriages compared with adults with less education. More educated individuals postpone marriage and have more opportunities over time to select more suitable partners (DIXON, 1978; GOLDSTEIN and KENNEY, 2001). In these ways, human capital affords people opportunities and resources to enrich their lives and thus has both direct as well as indirect effects on happiness.

However, it is important to acknowledge that research at the national level has not found a strong

relationship between human capital and well-being. Why might human capital or education level have a stronger relationship with happiness at the metropolitan level than at the national level? It is clear that income itself turns on human capital. Previous research has documented the strong effects of human capital on metropolitan-level income, so it could be said that human capital in effect captures or accounts for much of the effect of income on happiness as well. It is simply a better underlying measure of the key factor that affects happiness.

Previous research (BERRY and GLAESER, 2005) has also shown growing variation or 'divergence' in human capital across metropolitan regions. Metropolitan regions are natural economic units – by definition comprising a labour market and commuting shed – so they are more coherent economic units than nations or even states. The metropolitan level is the scale where key economic drivers such as human capital truly matter, and where their effects are less muddled by political or jurisdictional boundaries. Higher levels of human capital are not only associated with higher income, but also higher human capital metros have many other attributes that have been found to affect

well-being. Higher levels of human capital at the metro level are associated with better health outcomes, lower levels of smoking and obesity, lower levels of crime, better schools, better quality housing, more natural amenities, higher levels of consumer amenities such as restaurants and cultural amenities, higher levels of openness and diversity, and a higher quality of life more generally – all factors that can and do affect happiness. While this research has documented the connection between human capital and happiness, further investigation is needed to gauge more precisely the interaction between human capital and these and other metropolitan-level factors that may directly or indirectly shape happiness and well-being.

Whether by providing greater occupational opportunities or an enhanced sense of control over one's environment, education offers important advantages to individuals. The present work shows that those advantages are far reaching and can actually influence the subjective well-being of one's friends and neighbours. If the psychological and physical health of individuals is to improve, it is crucial that a clearer understanding of precisely how human capital impacts the well-being of cities and metropolitan regions must be gained.

APPENDIX A

Table A1. Descriptive statistics for excluded regions due to a lack of well-being data

	<i>n</i>	Minimum	Maximum	Mean	Standard deviation
Gross domestic product per capita	152	19 727	77 581	41 175.71	9854
Average income	153	22 213	64 687	36 070	5553
Average wage	152	31 566	52 169	40 287	3596
Income inequality	183	0.381	0.515	0.440	0.027
Median housing value	175	76 400	456 100	147 590	56 650
Housing-to-wage ratio	152	2.07	8.82	3.583	1.176
Homeownership	175	0.493	0.807	0.68	0.057
Unemployment	183	4.00	27.70	9.43	3.46
Change in unemployment	183	-1.20	5.90	2.42	1.17
Human capital	153	0.07	0.27	0.142	0.042
Population density	152	2.59	222.86	58.19	36.50
Age	175	25.30	50.90	35.08	4.11
Commute time	175	15.79	31.36	22.23	2.09
January temperature	182	3.95	64.00	33.91	12.00
July temperature	182	61.90	93.70	75.95	5.43
Temperature stability	182	11.90	65.35	42.04	8.78
Valid <i>n</i> (list-wise)	149				

NOTES

1. While there are no publicly available data for the sub-indices at the metro level, RENTFROW *et al.* (2009) examined the relations between the well-being index and the sub-indices at the state level: life evaluation (current and future prospects) correlates with 0.61; emotional health (daily positive and negative experience) correlates with 0.58; physical health (for example, body mass index (BMI) and days absent from work) correlates with 0.58; healthy behaviour (for example, smoking, eating habits

and exercise) correlates with 0.58; work environment (for example, job satisfaction and relations with supervisors) correlates with 0.46; and basic access (clean water, medicine, healthy food and healthcare access) correlates with 0.24, but is insignificant.

2. Age squared was also employed to capture non-linearities. The results remained negative and significant.
3. While this study employ 2009 Census data for housing values, the regressions were also run with 2006 housing value data (before the financial crisis) with similar results.

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