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Is bigger better? Metropolitan area population, access, activity participation, and subjective well-being

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Abstract: Researchers have posited that larger, denser metropolitan areas have important consumption advantages. We examine this using Cragg two-part hurdle and ordinary least square (OLS) regression models employing data from the American Time Use Survey. We test whether: 1) large metropolitan area residents participate in more out-of-home activities because these activities are more plentiful, richer, and/or easier to access, 2) large metropolitan areas have lower travel times because of higher densities, and 3) activities in larger metropolitan areas have more positive associations with subjective well-being than those in smaller places. We reject all three hypotheses. Metropolitan area population size is largely unrelated to time spent outside the home, excluding travel. Large-metropolitan-area residents participate in more arts and entertainment activities and eat and drink out more often, but they socialize, volunteer, and care for others outside the home less. Larger metropolitan areas are associated with dramatically more travel time. We find no evidence that large metropolitan area activities contribute any more or less to life satisfaction or affect than activities in smaller places. We also find that life satisfaction does not covary with metropolitan area size. In sum, living in a large metropolitan area may primarily involve a tradeoff of (travel) time for money (higher wages), with little net change in welfare.

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1 Introduction

What do we get from life in big cities? Conversely, are there benefits to living in small towns? Since the Industrial Revolution, people have been moving to cities in ever-increasing numbers. The United States is now 81 percent urban as opposed to 40 percent at the turn of the 20th century (U.S. Census Bureau, 1993, 2016). Urban growth has taken hold worldwide, and rural areas have been losing population

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share relative to larger agglomerations; in 1800 only three percent of the world's population lived in urban areas, while 50 percent did in 2008 (Population Reference Bureau, 2016). Glaeser and his coauthors (Glaeser & Gottlieb, 2006; Glaeser, Kolko, & Saiz, 2001) attempt to explain this, emphasizing that not only can people make a better living in larger cities, but also that the quality of life is simply better in bigger places.

In this paper, we use data from the American Time Use Survey and a set of statistical models to examine whether daily life outside the home is different for residents of more populous U.S. metropolitan areas compared with residents of smaller areas or those outside of metropolitan areas entirely.[1] We study participation in a range of discretionary and non-discretionary out-of-home activities; the travel burdens associated with engaging in these activities; and how these activities relate to subjective well-being (SWB), including both life satisfaction and mood (or "affect"), and how these associations vary depending on the size of the metropolitan area. In other words, controlling for sociodemographic factors, we analyze whether larger metropolitan areas provide superior access to consumption opportunities, including consumer goods and services but also public and private cultural and recreational amenities, opportunities for social interactions, and qualities of the local environment. In this broad definition of "consumption," we emphasize that not all consumption activity in cities is economic.

Three hypotheses would naturally flow from the assumption that "bigger is better":

a. If larger metropolitan areas feature more numerous, varied, and higher-quality opportunities, large-metropolitan-area inhabitants should spend more time outside of their homes participating in these activities.
b. The quantity and density of opportunities in more populous urban areas should result in easier access to activities. Therefore "travel time prices" (the amount of travel time required for each minute of out-of-home activity time) should be lower in larger metropolitan areas.
c. In addition to being quantitatively more plentiful, large-metropolitan-area activities should be qualitatively superior due to their number and variety. If this is the case, residents of large metropolitan areas should reap higher SWB from their participation in out-of-home activities.

2 Existing scholarship

2.1 The urban economics of activity generation and amenity consumption

The origin and purpose of cities have long been subjects of inquiry (Jacobs, 1969; Lynch, 1959; Mumford, 1961; Ross, 1957; among many others). While theories abound, scholars widely agree that the growth in the number and size of cities is due in large part to the advantages associated with agglomeration and the increased accessibility it facilitates (e.g., Fugita & Thisse, 2002; Glaeser et al., 2001; Marshall, 1890; Smith, 1776; Thünen, 1921). For example, in his book *Good City Form*, Lynch (1959, p. 187) writes, "Cities may have first been built for symbolic reasons and later for defense, but it soon appeared that one of their special advantages was the improved access they afforded."

There is an extensive body of scholarship on agglomeration, largely focused on its benefits to production such as increasing returns to scale, lower transport costs, the presence of better-developed infrastructure, more developed labor markets, larger local markets, and knowledge spillovers (Alonso, 1971; Fugita & Thisse, 2002; Glaeser et al., 2001; Marshall, 1890; Quigley, 2013; among others). However, historically, economists have assumed that large cities were at a disadvantage with respect to consumption amenities (Glaeser et al., 2001; Jacobs, 1969; Lynch, 1959; Ross, 1957). Large urban areas can be expensive places to live, and can experience high rates of inequality (Baum-Snow & Pavan, 2012), traffic congestion (Texas Transportation Institute, 2015), crime (Glaeser & Sacerdote, 1999), crowding, and

[1] Throughout the remainder of this paper we use the term "metropolitan areas" to connote population agglomerations not restricted to "cities" as defined by political boundaries. These are defined by the U.S. Census Bureau, which states "Metropolitan statistical areas consist of the county or counties (or equivalent entities) associated with at least one urbanized area of at least 50,000 population, plus adjacent counties having a high degree of social and economic integration with the core as measured through commuting ties" (U.S. Census Bureau, 2016). A portion of our sample lives in non-metropolitan areas.

some kinds of pollution and disease (Dye, 2008).[2] However, some scholars assert that, over time, the presence, variety, and quality of consumer amenities in large metropolitan areas have grown relative to those in smaller places (Brueckner, Thisse, & Zenou, 1999; Chen & Rosenthal, 2008; Clark, Lloyd, Wong, & Jain, 2002; Glaeser & Gottlieb, 2006; Glaeser et al., 2001).[3]

Large urban markets can offer a greater diversity of consumer services and goods when those goods require scale economies (e.g., live arts performances, museums, professional sports teams, etc.) (Abdel-Rahman, 1988; Glaeser & Gottlieb, 2006; Glaeser et al., 2001; Rappaport, 2008; Schiff, 2015). Further, larger cities are often held to facilitate greater access to goods, services, and social networks due in part to the lower transportation costs that are theorized to be associated with high-density living (Glaeser & Gottlieb, 2006; Glaeser et al., 2001). Metropolitan area size is closely related to density; our analysis (results available on request) shows a correlation between U.S. Metropolitan Statistical Area (MSA) population and urbanized area population density of .76. Finally, some of the consumption value of large metropolitan areas may lie in their physical environments, such as the presence of aesthetically pleasing historic buildings or high-quality public spaces (Brueckner et al., 1999; Carlino & Saiz, 2008; Florida, 2012).

Glaeser et al. (2001) offer evidence of the importance of the "consumer city," citing the increase in reverse commuting (a preference for center-city living even if it requires travel to outlying areas for employment), and higher growth in both population and rents in larger, densely-developed, amenity-rich metropolitan areas. In other work, Glaeser and Gottlieb (2006) conclude real wages have been falling in the largest cities relative to other places, and take this as evidence that workers are demanding less compensation to live in the largest cities because such cities are increasingly attractive places in which to live. It is important to note, however, that these measures of urban quality are indirect and might have other explanations. For example, higher real estate prices in large cities may be a result of regulatory constraints on housing construction there. (Glaeser notes such regulation can vary dramatically across metropolitan areas (Glaeser, Gyourko, & Saks, 2005)). In this paper, we measure the scale, scope and quality of urban activities in a more direct manner.

In the sections below, we discuss the scholarship related to the three potential hypotheses, focusing on U.S. studies, the geography of our analysis.

2.2 Metropolitan area size and the number, diversity and quality of opportunities

Existing research on the relationships between metropolitan area size and out-of-home activity participation, travel time prices, and SWB is limited to only a handful of U.S. studies, many of which examine a single metropolitan area and/or focus on a relatively small subset of time-use activities. Overall, the findings from this body of literature are mixed.

First, there is little extant study of the relationship between metropolitan area size and activities. We have identified only one such paper: using data from the 1990/91 Nationwide Transportation Survey, Levinson (1999) finds relatively little time use differentiation across U.S. Consolidated Metropolitan Statistical Areas (CMSAs). However, he notes that individuals in larger CMSAs spend slightly more time at work and less time at home. Further, controlling for other determinants of activity duration, he finds a positive relationship between metropolitan area size and time spent at many activities other than at home and work, but a negative relationship with time spent shopping.

While not specifically addressing the issue of population size, some studies show relationships between urban form, particularly density, and time use (Lee, Washington, & Frank, 2009; Levinson, 1999; Pinjari & Bhat, 2010; Timmermans et al., 2002). These associations are small relative to the impact of socioeconomic factors (Levinson, 1999). In their analysis of travelers in the Atlanta region,

[2] These factors and others have resulted in urban population loss in some areas and fueled a growing body of literature on shrinking cities. See, for example, Beauregard (2009).

[3] Kemeny and Storper (2012) assert that the role of amenity-seeking behavior is less relevant to long-distance migration decisions but may have a much more important role to play in intraregional residential location behavior.

Lee et al. (2009) find relationships between urban form and time use that vary across activity type and day of the week. In general, they find that during the week individuals participate in more discretionary activities in dense, mixed-use environments; those living in neighborhoods with a lower mix of uses tend to bundle their discretionary activities on the weekends, perhaps due to time constraints. Using data for the San Francisco Bay Area, Pinjari and Bhat (2010) test the relationship between seven in-home and out-of-home activities and a number of characteristics associated with the "activity-travel environment." They find only one significant effect: a positive association between retail employment density and out-of-the-home meals among non-workers.

2.3 City size and accessibility

Do larger (and presumably denser) metropolitan areas foster accessibility by reducing travel times, and as a result, possibly increasing activity participation? Research on the Netherlands has found that urban density and car ownership may contribute to some relaxation of time use constraints (Ettema, Schwanen, & Timmermans, 2007). Spatial accessibility to specific activities, such as restaurants, may increase the time spent engaging in those activities (Spissu, Pinjari, Bhat, Pendyala, & Axhausen, 2009).

The findings on the relationship between travel time expenditures and area type (e.g., central city/suburb, metropolitan area by size, and density) are mixed (Mokhtarian & Chen, 2004). In general, studies show a positive relationship between metropolitan area size and commute times (Ruggles, Genadek, Goeken, Grover, & Sobek, 2015; Texas Transportation Institute, 2015), though not all studies reach this conclusion (Zolnik, 2011) and some find the positive relationship between metropolitan area size and travel time does not appear to extend to non-work travel (Gordon, Kumar, & Richardson, 1989a, 1989b; Lee et al., 2009).

Scholars have analyzed the relationship between travel duration and activity duration, finding a positive and significant association (Hamed & Mannering, 1993; Kitamura, Fujii, & Pas, 1997; Levinson, 1999); all things equal, individuals are willing to spend more time traveling to destinations where they plan to spend a longer period of time. The strength of this relationship may vary across activity types. For example, Ma and Goulias (1998) find an association between activity and travel duration for subsistence but not discretionary activities. Studies on travel time prices in the U.S. have not addressed their relationship to population size. However, in a study of the Netherlands, Schwanen and Dijst (2002) find that urban area size does not appear to be a significant determinant of travel time prices.

2.4 City size and subjective well-being

Finally, the third hypothesis we test avers that activities in large metropolitan areas should be qualitatively superior to those in smaller ones, with stronger and more positive connections between out-of-home activities and SWB. Studies suggest that at low levels of economic development, life satisfaction is higher in urban compared to rural areas (Easterlin, Angelescu, & Zweig, 2011). However, these differences narrow, and in some cases reverse, with increased economic development and as the characteristics of urban and rural areas become more similar with respect to income, occupational structure, and education (Easterlin et al., 2011). Glaeser et al. (2016) find a weak but positive correlation between life satisfaction and urban area size; however, this relationship is not statistically significant holding constant individual characteristics. Moreover, a number of other studies show that residents of small towns or rural areas experience greater life satisfaction, although in most of these studies the effects are modest (Berry & Okulicz, 2011; Gerdtham & Johannesson, 2001; Graham & Felton, 2005; Hayo, 2004; Hudson, 2006; Morris, 2011; Okulicz-Kozaryn, 2015; Sander, 2011). However, these studies typically control for income, which is correlated with SWB and tends to be lower in rural areas, so evidence of links between rural or small metropolitan area living and higher SWB might be deceptive (Dolan, Peasgood, & White, 2008).

The evidence reviewed by Pfeiffer and Cloutier (2016) tends to show that lower population densities (whether measured at the national, city, or neighborhood scale) are associated with more happiness, not less.

In sum, research on how metropolitan area size relates to activity participation, travel, and well-being is limited. Existing scholarship tends to rest on older data, center on single metropolitan areas, use indirect measures, and incorporate a limited selection of activities. Moreover, while there is a large and growing body of research on SWB, some of which addresses metropolitan area size, it has not incorporated the mediating role of activity participation.

3 Data and variables

Our data are drawn from the American Time Use Survey, an undertaking of the U.S. Bureau of Labor Statistics and the Bureau of the Census (Bureau of Labor Statistics, 2016; Hofferth, Flood, & Sobek, 2013). The survey has been conducted every year since 2003. The sample is highly representative of the United States population as a whole, in part due to a high response rate. The sample size is large: roughly 13,500 responses are collected per year. The sample is comprised of adults over the age of 14 excluding residents of institutions such as nursing homes and prisons.

Professional interviewers assist respondents in reconstructing their activities on the day prior to the survey. The interviewers then categorize the time uses. There are over 460 categories; this provides an in-depth look at activity patterns. All activities are assigned to one and only one category. Travel trumps all other activity definitions, so that, for example, talking on the phone while in the car is categorized as travel, not phone, time. The ATUS assigns trip purposes; the rule is that a trip's purpose is defined by the subsequent activity, except for trips to home, the purpose of which is assigned according to the preceding activity. An activity may not have associated travel if it is sandwiched between two or more other activities at the same location; a small number of cases in our sample fall into this category.

We examine 16 categories of time use, further aggregating these into mandatory and discretionary activities, and then into "any-out-of-home" time. In doing so we follow the lead of other authors (Chen & Mokhtarian, 2006). Most activities are clear-cut: for example, we count work and education as mandatory, and socializing and eating out as discretionary. The only major out-of-home activity we exclude from these categories is travel time, which we model separately. Our 16 disaggregated time uses cover 98.8 percent of all out-of-home time.

The ATUS also collects demographic data, including variables that are commonly used in social science model specifications such as age, sex, race and ethnicity, income, employment status, citizenship, marital status, and the presence of own children in the household. These data are employed as covariates in our models. In addition, from 2006-2008 and from 2010-2013 the ATUS asked respondents to gauge their physical health in five categories ranging from poor to excellent. Since activity patterns are likely influenced by individuals' health, we include the health variable, which results in a reduction in the sample size. However, we still observe over 84,000 individuals in our activity models, 21,000 individuals in our life satisfaction models, and 100,000 activities in our affect models.

The survey also collects geographic data. This includes the respondents' Census region (Northeast, Midwest, South and West). Moreover, data provided by the ATUS-X site (Hofferth et al., 2013) include respondents' metropolitan area population. All respondents are assigned by ATUS-X to one of seven bins: nonmetropolitan or not identified, and metropolitan area populations of 100,000-249,999, 250,000-499,999, 500,000-999,999, 1,000,000-2,499,999, 2,500,000-4,999,999, and 5,000,000 and over. We assigned populations at the midpoints of the categories, except for the highest group, for which we constructed a weighted average of the populations of all U.S. Consolidated Metropolitan Statistical Areas over 5,000,000 persons as enumerated in the 2010 census. This yielded a population figure of 10,952,000 in the top-coded bin.

Our other primary variables of interest relate to happiness and SWB. In 2010, 2011, and 2013 the ATUS collected data on respondent affect during individual activities. Participants were asked to rate the degree to which they were feeling six different emotions on a 0-6 scale during three randomly sampled activities: the emotions were happiness, sadness, pain, fatigue, stress, and the degree to which the activity was meaningful. Additionally, in 2012 and 2013 the ATUS collected participants' scores on the Cantril Ladder life satisfaction question (Cantril, 1965). This question asks respondents to gauge the overall quality of their lives, with a score of 0 indicating that they are living the worst possible life, and 10 the best possible life. The Cantril Ladder is one of the oldest single-item life satisfaction measures, and is used widely. For more on the Ladder and its strengths and limitations, as well as those of single-item life satisfaction measures more generally, see Morris (2015).

4 Methodology

Our examination of the relationships between population size, activities, travel, and well-being proceeds as four analyses.

4.1 Modeling activity and travel participation and duration

Our first set of models compares participation in, and duration of participation in, our activity categories, focusing on their relationship with metropolitan area size. As was previously noted, we proceed from the assumption that the more attractive and available an opportunity is, the more time an individual will tend to spend doing it. Obviously, this is a simplification: certainly one would prefer a 10-minute visit to the Department of Motor Vehicles over a two-hour one. However, we presume that in general individuals seek to maximize behavior that provides them utility and vice versa. Hence, we presume more frequent and longer out-of-home activity times are markers of richer activities.

Although a number of researchers have shown that travel is not as unpleasant an activity as might be assumed (e.g., Mokhtarian & Salomon, 2001; Morris & Guerra, 2015; Ory et al., 2004; Ory & Mokhtarian, 2005), we assume that in most cases individuals seek to minimize travel time, or nearly so.

Analyzing time use data involves some methodological challenges. Most of our sample did not participate in most of the activities on the study day. This large number of zero times renders the use of ordinary least squares (OLS) regression problematic. The methods most commonly used for working with this sort of data include Tobit regression, Heckman's generalized Tobit model (Tobit Type II), generalized linear models with a Poisson-gamma random component, and Cragg two-stage hurdle models (Cragg, 1971). We conduct Cragg modeling.

An advantage of the Cragg method is that it allows separate modeling of the decision to engage in the activity (using a probit model) and the amount of time spent on the activity once the decision is made to engage in it (using a truncated linear or exponential OLS model). We presume that different psychological processes contribute to these two decisions.

In most cases we elected to use exponential models (taking the natural log of the activity time) for conditional activity time, because time uses tend to be positively skewed, with most people participating in them for a relatively short amount of time but with a long tail to the right. However, certain time uses are more normally distributed, making a truncated linear model more appropriate. We conducted tests for each time use; in four cases (work, education, mandatory time, and any-out-of-home time) a linear model was superior.

We use the estimates to generate predicted unconditional activity times for several different metropolitan area sizes, holding the control variables at their means. For brevity's sake we do not report the predicted probabilities of engaging in the activities, and the predicted conditional activity times, but will furnish these results on request.

4.2 Modeling travel time prices

In order to test the hypothesis that large metropolitan areas reduce the burden of travel, we present a set of models of travel time prices below. In doing so we follow Chen and Mokhtarian (2006) in making the straightforward assumption that the ratio of travel time to activity time is a reasonable reflection of the time cost of travel, or the number of travel minutes needed to "buy" an activity minute. We presume that less travel time and more activity time reflect better access, so a lower travel time price is more desirable.

The distribution of travel time prices is positively skewed. In order to create a more normal distribution, we perform log transformations on them. In these models we exclude individuals who reported activity participation on the study day with no associated travel. These cases are rare: for most time uses in the range of 2-3 percent of the population participated in the activity but reported no travel for that purpose.

4.3 Modeling life satisfaction

To more directly judge whether big city opportunities are superior in quality, as well as more numerous and possibly diverse, we model the SWB reported by respondents and its association with city size and activities. Following Andrews and Withey (1976), scholars have disaggregated SWB into three components. The first two are positive affect and negative affect, reflecting emotions felt "in the moment" as life is experienced. Positive and negative affect are viewed as related and negatively correlated, but also semi-independent, constructs (Tellegen et al., 1988). It is unlikely that an individual will feel happy and sad simultaneously, but it is also true that over time one person may feel both more highs and lows than another. The third construct is "life satisfaction"; as the name implies, it reflects individuals' judgments about their overall quality of life. Space precludes a thorough discussion of the large body of literature on happiness and SWB; for discussions see Argyle (2001), Diener et al. (2017), Diener et al. (1999), and Dolan, Peasgood and White (2008). For a review focused on SWB's links with urbanization, geography, neighborhoods, and city planning, see Pfeiffer and Cloutier (2016).

SWB researchers sometimes treat life satisfaction scores as cardinal and model them using OLS; others treat them as ordinal and use ordered logit modeling or a similar technique. This question has been studied specifically in the context of single-item life satisfaction scores, and the conclusion is that it makes very little difference which method is used (Ferrer-i-Carbonell & Frijters, 2004). Hence, we present results from OLS regressions primarily because they are more straightforward to interpret, but we also performed ordered logit modeling as a robustness test.

Our models examine the relationships between life satisfaction (the dependent variables), time engaged in activities, and city size; our independent variables of interest are the interactions between the latter two. These indicate whether activities are associated with more, less, or approximately the same life satisfaction as metropolitan area size increases.

4.4 Modeling affect

We also examine affect during out-of-home activities. As we note above, we observe the intensity with which subjects felt six different emotions during an activity. We amalgamate these emotions into a composite affect score using the Affect Balance Scale method (Bradburn, 1969; Kahneman & Krueger, 2006), which involves taking the mean of positive emotions (in our case, meaningful and happy) and subtracting the mean of negative emotions (sadness, fatigue, stress and pain). This generates a score on a +6 to -6 scale. Because this variable exhibits negative skew, we reflect it (subtracting from 7), which produces a score between 1 and 13, with 13 being the least happy; we then take the natural log. Finally, so that positive scores reflect positive emotions, we multiply by -1. Thus:

$$Affect = -1 * ln\left(7-\left(\frac{happy+meaningful}{2} - \frac{sad + tired + fatigue + pain}{4}\right)\right)$$

We then use OLS to model the relationships between activity type and metropolitan area size, and their interaction, and overall affect. Again, the interaction reflects whether activities in larger cities are associated with different levels of affect compared with activities in smaller places. We also examine relationships between activity type, metropolitan area size, and each individual emotion.

5 Results

5.1 Metropolitan area population, activity participation, and activity duration

Table 1 presents the results of 20 Cragg hurdle models showing the relationship between activity times and city size. Each row reports the results of one model, with the dependent variable (the activity) in the far-left column. The second column presents the coefficient and t-statistic for metropolitan area size from the probit model predicting whether individuals participate in the activity or not, and the third column presents the coefficient and t-statistic from the model predicting activity time given that the respondents engaged in the activity. The models include all of the demographic covariates listed below the table; the estimates for these are omitted to conserve space but are available on request.

Because the coefficients are very difficult to interpret, the next five columns show predicted activity and travel times for metropolitan areas of different sizes. These figures provide a general idea of the magnitudes of the activity times. Note that these are unconditional times; that is to say, they approximate the average amount of time people spend on the activities, not the average amount of time people spend engaged in the activities provided they participate in them. The predictions are generated holding all control variables at their means.

Table 1: Cragg hurdle models: Metropolitan area population, activity participation, and activity duration

1	2	3	4	5	6	7	8	9	10
Activities	**Coefficient: Metro Size (in 000s) and Activity Participation**	**Coefficient: Metro Size (in 000s) and Activity Duration**	**Predicted Unconditional Activity Duration by Metro Size (in minutes per day)**					**Mins/Week Diff. between 20m and 25k**	**% Diff. 20m to 25k**
			25k	**1m**	**5m**	**10m**	**20m**		
All Out-Of-Home[1]	4.93e-06 * (2.24)	-.0010521** (-2.82)	345.1	344.7	343.2	341.3	337.3	-54.6	-2.3
All Mandatory Activities[1]	3.36e-06 (1.86)	-.0014026** (-2.78)	220.3	220.0	218.7	217.1	213.9	-44.8	-2.9
Caring for Others	-1.31e-06 (-0.71)	-7.51e-06 (-1.93)	13.8	13.7	13.2	12.6	11.5	-16.1	-16.7
Education[1]	-5.33e-07 (-0.14)	-.0014961 (-1.36)	.947	.941	.917	.888	.832	-0.8	-12.1
Household Maintenance	-6.67e-06*** (-3.31)	3.35e-06 (0.85)	9.23	9.17	8.91	8.60	7.98	-8.8	-13.5
Services, Excluding Medical	3.72e-06 (1.45)	.000015* (2.47)	2.00	2.04	2.23	2.49	3.11	7.8	55.5
Medical	1.93e-06 (0.59)	.0000124* (2.37)	2.28	2.32	2.48	2.70	3.19	6.4	39.9
Shopping Ex. Groceries	3.70e-06* (2.23)	-5.02e-07 (-0.18)	17.4	17.5	17.8	18.1	18.7	9.1	7.5
Grocery Shopping	-1.68e-06 (-0.87)	-4.18e-07 (0.17)	6.65	6.62	6.55	6.45	6.25	-2.8	-6.0
Work[1]	-3.20e-06 (-1.63)	-2.35e-06 (-0.01)	116.2	115.8	114.1	112.1	108.0	-57.4	-7.1
All Discretionary Activities	-9.31e-07 (-0.57)	4.36e-07 (0.29)	103.8	103.8	103.8	103.7	103.7	-0.7	-0.1
Eating/Drinking	6.31e-07 (0.38)	5.78e-06*** (4.86)	24.2	24.3	24.9	25.7	27.4	22.4	13.2
Arts/Entertainment	.0000102*** (3.58)	7.78e-06* (2.04)	3.88	4.00	4.53	5.29	7.17	23.0	84.8
Socializing	-.0000118*** (-6.51)	1.80e-06 (0.58)	25.9	25.5	24.1	22.4	19.1	-47.6	-26.3
Leisure/Relaxing	-4.75e-06** (-2.40)	5.94e-06 (1.73)	13.4	13.4	13.3	13.2	13.0	-2.5	-2.6
Playing Sports	6.42e-06** (3.14)	-5.77e-06* (-2.31)	11.6	11.7	11.9	12.2	12.8	8.4	10.3
Watching Sports	-9.77e-06* (-2.28)	5.36e-09 (0.00)	1.44	1.40	1.26	1.10	0.83	-4.3	-42.4
Volunteering	-.0000117 (-4.20)	2.25e-06 (0.35)	7.18	7.01	6.40	5.69	4.46	-19.0	-37.9
Religion	-1.00e-06 (-0.43)	1.41e-06 (0.45)	5.49	5.48	5.47	5.45	5.41	-0.6	-1.5
All Travel	2.00e-06 (0.96)	.0000165*** (14.57)	72.9	74.1	79.3	86.3	102.2	205.1	40.2

t statistics in parentheses.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

N=84,131

[1]=truncated linear model; all other models=exponential (ln of the dependent).

Covariates include physical health, age and age squared, sex, log of household income normalized by Modified OECD persons in household, education (years), race, Hispanic status, citizenship, marital status, children in household, employment status, year, and Census region (Northeast, South, West, Midwest).

Models estimated taking survey characteristics (sampling weights, clusters and strata) into account.

Predictions are generated holding the control variables at their means.

Full model results are available on request.

Again, for brevity's sake we do not present estimates for the control variables, but, for example, those who spend more time out of home, conditional on going out, tend to be healthy, in the middle of life (not young or old), employed, higher-income, Hispanic, citizens, not married, and they have few or no children in the household. These results are quite intuitive.

To aid in visualizing the data, Figures 1, 2, and 3 show predicted unconditional activity times in minutes per day for the bookend cases, residents of a very small place (25k) and a very large one (20m).

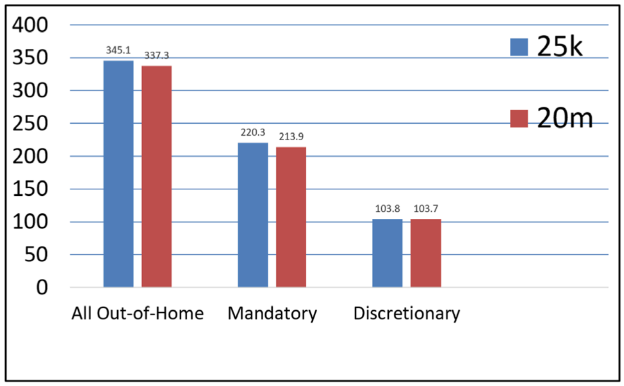

Figure 1: Predicted activity times for two metropolitan area sizes: All-out-of-home, mandatory, and discretionary activity times

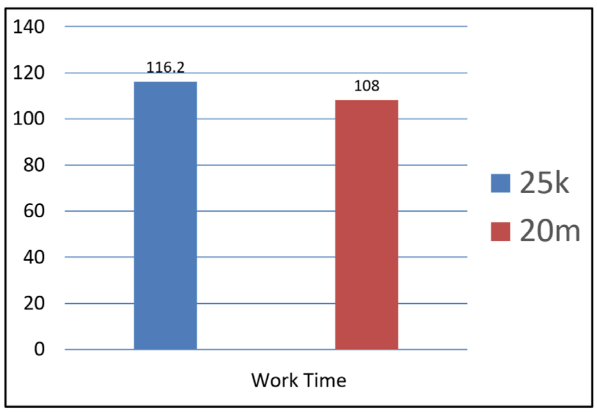

Figure 2: Predicted activity times for two metropolitan area sizes: Work times

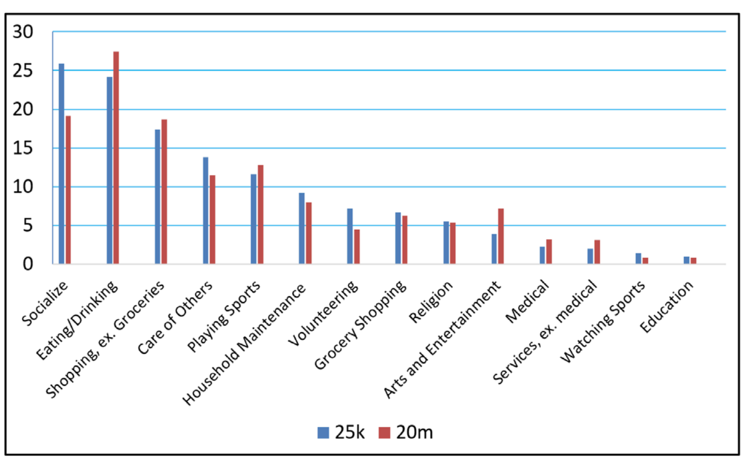

Figure 3: Predicted activity times for two metropolitan area sizes: Other disaggregated activity times

The models suggest that there is relatively little difference in activity participation associated with different metropolitan area sizes. Individuals living in larger metropolitan areas are slightly more likely to leave home on any given day, but larger metropolitan area size is actually associated with slightly less time outside the home conditional on leaving it. As a result, the predictions for total out-of-home time are almost identical across metropolitan area sizes, with, if anything, residents of smaller metropolitan areas spending more time out of home. Disaggregating, there is no relationship between city size and discretionary activities, and only a weak relationship between size and mandatory activities, with residents of larger metropolitan areas predicted to engage in them less. For 10 of the 16 specific activities there is no association between propensity to engage in activities and metropolitan area size; this also holds true for 11 of the conditional time associations. Some findings of little or no difference are particularly noteworthy. For example, there is very little difference in work or shopping time across metropolitan area sizes, which goes contrary to what might be expected if larger cities provide better productive opportunities or richer shopping opportunities.

We interpret our results as showing seven noteworthy differences. Larger metropolitan area residents are somewhat more likely to spend more time eating and drinking out. This equates to a predicted 22.4 additional minutes a week eating out when comparing a resident of a New York-sized city with a non-metropolitan person. However, the proportional difference is not large, at 13 percent. The resident of a metropolitan area of 20m is predicted to spend nearly twice the amount of time participating in arts and entertainment activities as the resident of a town of 25k, as prior research would suggest. However, in general people spend little time engaged in these activities, so in total the 20m individual is only predicted to spend 23 more minutes a week enjoying arts/entertainment, or one two-hour arts/entertainment activity every six weeks, compared with the small-town resident. Still, these two findings suggest that larger places do have richer consumption opportunities, albeit to a limited extent. In proportional terms, larger city residents spend considerably more time accessing services, including medical care, but these activities are associated with very little unconditional time, so that in absolute terms the differences by city size are quite small.

At the same time, the small-town resident is expected to spend more time on informal socialization (48 minutes a week), caring for others (16 minutes a week), and volunteering (19 minutes a week). These results support the narrative that small metropolitan areas might foster stronger social ties (see below).

These differences notwithstanding, the results suggest that activity patterns are quite similar across places of varying sizes when controlling for demographic characteristics. The one major exception is travel time.

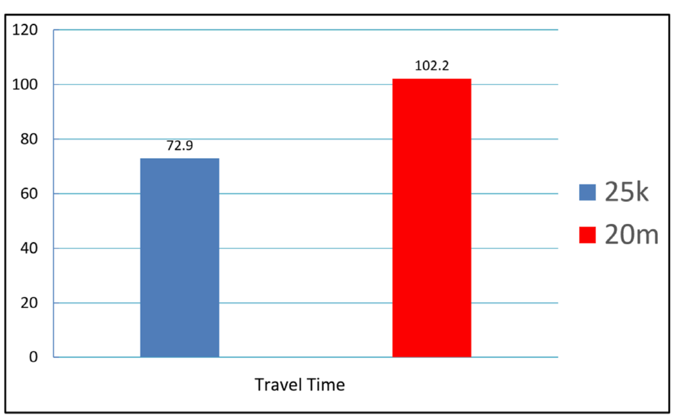

Figure 4: Predicted activity times for two metropolitan area sizes: Travel time

We do not reproduce our results for each trip purpose (these are available on request) but for ten of our time uses large city residence is significantly associated with higher conditional travel time. Overall, residents of a metropolitan area of 20m are predicted to spend 30 additional minutes per day, or 3½ hours per week, traveling compared with a resident of a town of 25k, a very large amount of time given that the quantity of truly discretionary time available to many people is quite constrained.

Thus, it appears that residents living in large and small metropolitan areas are doing fairly similar things for a very similar amount of overall out-of-home time, but large-metropolitan-area residents are spending considerably more time getting to and from those activities, presumably at the expense of less in-home time. We explore this further in the next set of models.

5.2 Metropolitan area population and travel time prices

The following table presents the results of 19 separate OLS regressions on the relationship between travel time prices and metropolitan area population. The dependent variables of each model are the logs of the travel time prices, in the far-left column. The independent variable of interest is metropolitan area population; the coefficient and t-statistic for this variable in each regression appears in the second column. The next columns show predicted travel time prices for places of different population sizes.

Table 2: OLS models of travel time prices and metropolitan area population

1	2	3	4	5	6	7	8	9
	Independent Variable= Metro Size (000s)	**Predicted Ratio: Travel Time to Activity Participation Time by Metro Size**						
Activity	**OLS Coeff.**	**25k**	**1m**	**5m**	**10m**	**20m**	**% Diff 20m vs. 25k**	**N R2**
Ln All Out-of-Home	.0000192*** (13.66)	.195	.199	.215	.236	.286	46.7	71,521 .102
Ln Mandatory Activities	.0000203*** (10.88)	.226	.230	.249	.276	.338	49.6	60,890 .143
Ln Caring for Others	.0000227 *** (5.51)	1.380	1.411	1.545	1.730	2.171	57.3	18,857 .027
Ln Education	.0000259** (2.86)	.0972	.0996	.1105	.1258	.1630	67.7	2,322 .172
Ln Household Maintenance	.0000116 (1.64)	.762	.771	.807	.856	.962	26.4	7,497 .029
Ln Services Ex. Medical	-8.70e-06 (-1.26)	.894	.886	.856	.819	.751	-16.0	4,530 .033
Ln Medical	-1.26e-06 (-0.14)	.390	.389	.387	.385	.380	-2.6	2,097 .024
Ln Shopping Ex. Groceries	3.33e-06 (1.20)	.865	.868	.879	.894	.924	6.8	26,810 .030
Ln Grocery Shopping	7.89e-06* (2.53)	.513	.517	.534	.555	.601	17.2	12,612 .030
Ln Work	. 0000329*** (14.94)	.0687	.0710	.0810	.0954	.1326	93.0	26,106 .080
Ln Discretionary Activities	.0000121*** (6.44)	.204	.206	.216	.230	.259	26.9	44,230 .013
Ln Eating/Drinking	.0000141*** (5.11)	.285	.289	.306	.329	.378	32.6	20,817 .022
Ln Arts/Entertainment	8.55e-06 (1.23)	.182	.183	.190	.198	.216	18.7	2,731 .033
Ln Socializing	9.71e-06** (2.63)	.269	.272	.283	.297	.327	21.6	16,147 .011
Ln Leisure/Relaxing	4.31e-06 (0.63)	.228	.229	.233	.238	.248	8.8	6,351 .055
Ln Playing Sports	8.58e-06 (1.89)	.174	.176	.182	.190	.207	18.9	6,620 .037
Ln Watching Sports	.0000135 (0.94)	.184	.186	.196	.210	.240	30.4	918 .047
Ln Volunteering	9.33e-07 (0.13)	.177	.177	.178	.178	.180	1.7	3,860 .024
Ln Religion	.0000201*** (3.59)	.184	.188	.201	.219	.261	31.8	6,449 .041

t statistics in parentheses.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Covariates include physical health, age and age squared, sex, log of household income normalized by Modified OECD persons in household, education (years), race, Hispanic status, citizenship, marital status, children in household, employment status, year, and Census region (Northeast, South, West, Midwest).

Models estimated taking survey characteristics (sampling weights, clusters, and strata) into account.

Predictions are generated holding the control variables at their means.

Full model results are available on request.

We observe a striking difference in travel time prices depending on the nature of the activity. Prices are very low for work and education, as these are activities at which people typically spend a great deal of time. In contrast, activities such as shopping (excluding grocery shopping), household activities, professional services, and caring for others have high travel time prices, since many people report doing these activities for only short periods.

In general, residents of larger metropolitan areas pay far higher travel time prices. Overall, a resident of a metropolitan area of 20m is predicted to spend roughly 50 percent more minutes of travel for each minute of activity time compared with a resident of a small town. Prices are predicted to be significantly higher in larger metropolitan areas for 11 of the 19 activities, and in no case is larger metropolitan area size associated with a significantly lower travel time price. It is noteworthy that arts and entertainment shows the smallest increase in travel time price as metropolitan area size rises, as might be expected if large metropolitan area residents have relatively good access to these activities. The largest difference by population is in work travel, with commutes in a metropolitan area of 20m predicted to be almost twice as long per minute of work time compared with commutes in a small town.

It should be noted that R-squareds in these models are quite low; we do not observe most of what is contributing to travel time prices, although predictive power is higher in models with all travel and activities aggregated than in models that disaggregate by activity type.

5.3 Metropolitan area population, out-of-home activities, and life satisfaction

Table 3 presents the results of five OLS regressions that examine the relationship between metropolitan area population, activity time, and life satisfaction. Life satisfaction is measured on a 0-10 scale. Times are in minutes per day.

Table 3: OLS models: Metropolitan area population, out-of-home activities and life satisfaction

Model Number	**1**	**2**	**3**	**4**	**5**
Independent Variables of Interest	**Life Satisfaction**	**Life Satisfaction**	**Life Satisfaction**	**Life Satisfaction**	**Life Satisfaction**
Metro Population (000s)	-0.00000485 (-1.00)	-0.00000476 (-0.98)	-0.00000440 (-0.56)	-0.00000582 (-0.73)	0.00000206 (0.24)
All Out-Of-Home Time		0.000231** (3.11)	0.000234* (2.56)		
Metro Population*All-Out-Home			-1.03e-09 (-0.06)		
Mandatory Time				0.000105 (1.04)	
Discretionary Time				0.000587*** (4.04)	
Metro Population*Mandatory				-9.69e-09 (-0.52)	
Metro Population*Discretionary				3.16e-08 (1.07)	
Caring for Others Time					-0.000336 (-0.74)
Education Time					0.000760* (2.49)
Household Maintenance Time					0.000358 (0.73)
Services Ex. Medical Time					-0.000592 (-0.38)
Medical Time					0.000610 (0.60)
Shopping Ex. Grocery Time					0.000911 (1.92)
Grocery Shopping Time					0.000978 (0.84)
Work Time					0.0000280 (0.26)
Eating/Drinking Time					0.00114* (2.28)
Arts/Entertainment Time					0.000456 (0.80)
Socializing Time					0.0000650 (0.19)
Leisure/Relaxing Time					-0.00000951 (-0.03)
Playing Sports Time					0.00157*** (3.56)
Watching Sports Time					0.000829 (0.77)
Volunteering Time					0.000859* (2.22)
Religion Time					0.00181*** (3.65)
Metro Population*Care Others					6.64e-08 (0.68)
Metro Population*Education					-1.31e-08 (-0.20)
Metro Population*Household Maintenance					-5.58e-08 (-0.46)
Metro Population*Services Ex. Medical					0.000000177 (0.59)
Metro Population*Medical					-0.000000167 (-0.64)

Table 3: OLS models: Metropolitan area population, out-of-home activities and life satisfaction (*continued*)

Metro Population*Shop Ex. Groceries					-0.000000118 (-1.15)
Metro Population*Grocery Shop					-0.000000340 (-1.47)
Metro Population*Work					-2.23e-08 (-1.12)
Metro Population*Eat/Drink					5.04e-08 (0.46)
Metro Population*Arts/Entertainment					5.45e-08 (0.51)
Metro Population*Socialize					-4.18e-08 (-0.65)
Metro Population*Leisure/Relax					6.97e-08 (1.05)
Metro Population*Play Sports					-0.000000112 (-1.11)
Metro Population*Watch Sports					-0.000000166 (-0.78)
Metro Population*Volunteer					2.85e-08 (0.32)
Metro Population*Religion					7.33e-08 (0.73)
Constant	3.988*** (13.95)	3.943*** (13.82)	3.942*** (13.78)	3.941*** (13.79)	3.837*** (13.37)
N	21736	21736	21736	21736	21736
R^2	0.158	0.159	0.159	0.160	0.163

t statistics in parentheses.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Covariates include physical health, age and age squared, sex, log of household income normalized by Modified OECD persons in household, education (years), race, Hispanic status, citizenship, marital status, children in household, employment status, year, and Census region (Northeast, South, West, Midwest).
Models estimated taking survey characteristics (sampling weights, clusters and strata) into account.
Full model results are available on request.

In results omitted to conserve space, we find life satisfaction is positively associated with good physical health (by far the strongest relationship) as well as income, being young or old but not in the middle of life, being employed if one is in the work force, being female, being black or Hispanic, being married, having children, and living in the South as opposed to the Northeast. All of these are quite intuitive, and are very much in concert with the broader life satisfaction literature (Dolan et al., 2008). R-squared statistics are roughly .160, which is high for life satisfaction models. However, the r-squared increases very little with the inclusion of the variables whose estimates are shown above (the model with none of these variables has an r-squared of roughly .158), so that city size and even city size and activities combined add little to efforts to explain life satisfaction.

As Model 1 shows, there is no relationship between metropolitan area population and life satisfaction when controlling for relevant demographic covariates. Next, as Model 2 shows, there is a positive and significant relationship between time spent out-of-home on the study day and life satisfaction. Model 3 disaggregates the time uses, and shows that discretionary out-of-home time is positively associated with life satisfaction, but mandatory time is not, a reasonable finding given our supposition that activities we choose to do are more rewarding than activities that we are obligated to do. Model 4 disaggregates the data further to show that time spent out of the home on education, eating/drinking, playing sports, volunteering, and participating in religious activities is all associated with higher life satisfaction. Nearly all out-of-home time uses have positive signs.

However, as Models 2, 3, and 4 show, in no case do interaction terms between population size and time use approach significance. Thus, we find no evidence that out-of-home activities in large metropolitan areas contribute to greater, or less, life satisfaction than do activities in smaller places.

5.4 Metropolitan area population, out-of-home activities, and affect

The following table presents results of five OLS models with our affect measure as the dependent variable. The unit of analysis is the individual activity. Activity variables are not durations but dummy variables indicating activity type. The omitted activity category is in-home activities. For brevity's sake, we again omit results for the sociodemographic control variables listed at the bottom of the table.

Table 4: Model results: Metropolitan area size, out-of-home activities and affect

Model Number	**1**	**2**	**3**	**4**	**5**
Independent Variables of Interest	**Affect Score**	**Affect Score**	**Affect Score**	**Affect Score**	**Affect Score**
Metro Population (000s)	-0.00000198 (-1.95)	-0.00000195 (-1.92)	-0.00000212 (-1.89)	-0.00000191 (-1.71)	-0.00000172 (-1.40)
Any Out-Of-Home		0.0669*** (10.93)	0.0649*** (8.33)		
Metro Population*Any Out-Of-Home			0.000000630 (0.40)		
Mandatory				-0.0306*** (-3.42)	
Discretionary				0.192*** (17.69)	
Metro Population*Mandatory				1.38e-08 (0.01)	
Metro Population*Discretionary				-0.000000426 (-0.19)	
Caring for Others					0.163*** (6.80)
Education					-0.0991** (-2.98)
Household Maintenance					0.0839** (3.02)
Services Ex. Med					-0.0289 (-0.48)
Medical					-0.275*** (-5.33)
Shopping Ex. Grocery					-0.0185 (-0.91)
Grocery Shopping					-0.128*** (-4.92)
Work					-0.0909*** (-6.86)
Eating/Drinking					0.165*** (10.32)
Arts/Entertainment					0.217** (3.23)
Socializing					0.267*** (12.28)
Leisure/Relaxing					0.0509 (1.88)
Playing Sports					0.181*** (6.62)

Table 4: Model results: Metropolitan area size, out-of-home activities and affect (*continued*)

Watching Sports					0.207* (2.28)
Volunteering					0.278*** (7.25)
Religion					0.434*** (12.60)
Travel					-0.00907 (-1.12)
Metro Population*Care Others					0.000000325 (0.06)
Metro Population*Education					0.00000777 (0.90)
Metro Population*Household Maintenance					0.00000379 (0.65)
Metro Population*Services Ex. Med.					-0.00000390 (-0.41)
Metro Population*Medical					0.0000149 (1.49)
Metro Population*Shop Ex. Groceries					0.00000114 (0.29)
Metro Population*Grocery Shop					0.00000572 (0.96)
Metro Population*Work					-0.00000323 (-1.20)
Metro Population*Eat/Drink					-0.00000247 (-0.77)
Metro Population*Arts/Entertain-ment					0.0000188 (1.59)
Metro Population*Socialize					0.00000286 (0.55)
Metro Population*Leisure/ Relax					-0.00000263 (-0.53)
Metro Population*Play Sports					-0.000000911 (-0.19)
Metro Population*Watch Sports					0.00000312 (0.19)
Metro Population*Volunteer					-0.00000131 (-0.12)
Metro Population*Religion					-0.00000254 (-0.35)
Metro Population*Travel					-0.000000628 (-0.38)
Constant	-1.717*** (-30.70)	-1.731*** (-30.98)	-1.731*** (-30.96)	-1.737*** (-31.12)	-1.731*** (-31.18)
N	102091	102091	102091	102091	102091
R^2	0.104	0.106	0.106	0.115	0.121

t statistics in parentheses.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Covariates include physical health, age and age squared, sex, log of household income normalized by Modified OECD persons in household, education (years), race, Hispanic status, citizenship, marital status, children in household, employment status, homeownership, and Census region (Northeast, South, West, Midwest).

Models estimated taking survey characteristics (sampling weights, clusters, and strata) into account.

Full model results are available on request.

Positive affect is strongly associated with good physical health, and also with being older, lower-income, less educated, female, nonwhite, married, not employed full-time, having more children, and living in the South. R-squareds for the models are not as high as for the models of life satisfaction; we do not observe the large majority of the factors that contribute to affect. With respect to our variable of interest, in the basic model larger metropolitan area size is negatively related to affect, although the effect is modest and only borderline significant. As Models 2 and 3 show, out-of-home activities are significantly related to better affect compared to in-home activities. Model 4, which disaggregates this relationship further, shows that mandatory and discretionary activities have different associations with affect: mandatory out-of-home activities are associated with poorer affect than in-home activities, but discretionary out-of-home activities are strongly related to elevated affect. Again, this is to be expected, since by their nature discretionary activities are undertaken by choice and presumably people would not engage in them if they were deleterious to SWB. Disaggregating activities further in Model 5, we see that time spent on education, medical care, grocery shopping and work are associated with poor affect, while every discretionary activity is associated with good affect. Finally, none of the interaction terms between metropolitan population and activity are significant. We thus find no evidence that population size has any bearing on affect during activities.

Models in which we disaggregate affect into the constituent emotions are available on request. They broadly confirm these results. Despite the fact that many of the activities had strong effect sizes, in only one case is an interaction term between metropolitan area size and activity type significant. We find sports watching to be less stressful in smaller metropolitan areas for reasons that are unclear. In the 113 other cases, the interactions between activity and metropolitan area population are insignificant. Metropolitan area population appears to be unrelated to emotions during activities, at least to the extent that our instrument can pick up such differences.

6 Discussion and conclusion

6.1 Hypotheses and findings

We find little evidence to support any of the three hypotheses that would flow from larger metropolitan areas providing superior access to consumption opportunities. First, large metropolitan area residents do not engage in more out-of-home activities, as might be expected if those activities were more plentiful or of better quality. If anything, the residents of small metropolitan areas spend more time outside the home. Further, we find but small differences in the composition of out-of-home activities. Large metropolitan area residents do more eating/drinking out and spend more time at arts and entertainment events, as may be expected if they have richer restaurant/bar scenes and cultural opportunities as is in keeping with the "Consumer City" hypothesis. Conversely, we find that small metropolitan area residents offset this time with more informal socializing, volunteering, and caring for others, as might be expected if social ties in small places are stronger (for example, see Onyx & Bullen (2000); Sørensen (2016); and Putnam (2001, p. 205), which states that the accepted wisdom is that "smaller [city size] is better from a social capital point of view"). This finding runs directly counter to the narrative that large metropolitan area residents may have a richer social life because of a larger pool of people with whom they can socialize.

However, none of these differences are very substantial; the data show that either proportional differences are not large (for example, in the cases of socializing or eating out), or that the time uses are quite minor (as with arts and entertainment or services). One might suppose that the difference in arts and entertainment participation between living in Seneca, South Carolina and New York City would be greater than 3.5 minutes per day.

The one activity that does show a very large difference is travel. Compared to the resident of a metropolitan area of 25k, the resident of a metropolitan area of 20m is predicted to spend an additional half hour a day traveling, or 50 percent more travel minutes per activity minute. Hence, the second hypothesis, that large (and, in most cases, dense) metropolitan areas make places easier to access, by, for example, bringing activities closer together in space, is clearly rejected. In addition, we note that the monetary cost of travel in large cities may also be higher because of the cost of parking and fuel, in addition to increased auto expenses flowing from the additional travel time. There are three relatively straightforward explanations for elevated travel times in large metropolitan areas. First, traffic congestion is disproportionately found in larger metropolitan areas (Texas Transportation Institute, 2015). This may result from the higher densities that are associated with large city size; higher densities might shorten trip distances, reducing traffic congestion, but they might also result in more vehicles being concentrated in limited road space, increasing congestion (Taylor, 2002). Second, there may be longer distances between many types of activity sites (particularly home and work) in larger metropolitan areas, due to the fact that the metro area covers a larger land area. People living in New Jersey and Long Island may commute 30 miles to work in Manhattan, which would be extremely rare in Seneca. Third, higher rates of transit use and walking may be found in larger cities, due to these cities' age, density, and transportation infrastructure, and, in general, transit and walking are low-speed modes. Thus, both density and overall metro area size may contribute to longer travel times in larger cities.

To explore this further, we conducted an analysis of trip frequency, mode choice, and travel times by metropolitan area size. Full results are available on request. Briefly, our findings suggest that large-metropolitan-area residents take significantly more trips, but not many more. Large-metropolitan-area residents take significantly fewer car trips, significantly more transit trips (by a dramatic amount on a proportional basis) and significantly more walking trips. Because transit trips tend to be long in duration and walking trips tend to be short in duration, and because the number of additional transit trips and additional walking trips in larger metropolitan areas are about equal, the difference in overall travel time due to differences in mode split does not seem large. The major cause of greater overall travel time in more populous metropolitan areas appears to be much lengthier travel times per walking and auto trip. This would suggest explanations one or two above have the most merit.

The third hypothesis—that large metropolitan area activities are somehow of higher quality—is also not supported by our data. Here our findings are more tentative, due to the nature of our measure of "quality." Certainly, a Broadway show is superior in some sense to the offerings of the Seneca community theater. It is possible that our measures—life satisfaction and affect—are insufficiently sensitive to pick up this difference, and that future research might reach different findings by examining activity quality in greater depth. However, one might also argue that our measures are strengths and not weaknesses, as they reflect the "bottom line" of whether activities actually improve our mental lives in a substantial way. Moreover, our measures are sensitive enough to pick up the difference in the contribution to well-being between say, working and eating out.

In addition to the finding that large-metropolitan-area activities are associated with no more or less SWB than their small-town counterparts, it is also worth noting that the differences in the composition of activity patterns that we find are not, according to our evidence, consequential for well-being. Taken as a group, arts and entertainment and dining out, which are done somewhat more in large metropolitan areas, are roughly associated with the same degree of (positive) affect as socializing, volunteering, or caring for others, the activities that appear to substitute for them in smaller places.

Finally, we find that, in the aggregate, large-metropolitan-area residents are no more or less happy than those in smaller places. Given the additional travel time apparently required as a cost of living in a populous area, this is an interesting finding with three possible explanations. First, perhaps higher big city incomes compensate for lost travel time; although our models do control for income, we might not observe this perfectly (for example, we do not control for wealth, and our income variable is topcoded at $150,000). Second, travel might not be a particularly unpleasant activity, which is suggested by our affect models where travel is roughly “affect neutral” (see also Morris & Guerra (2015)). Thus, perhaps more travel does not adversely affect life satisfaction. Finally, travel may detract from quality of life, but not at a level of magnitude that it can “move the needle” for life satisfaction, which is a very broad construct encompassing genes, personality, job satisfaction, satisfaction with family life, and much else in life. Thus, the costs of additional travel may be real but too small to measure using this indicator.

6.2 Caveats and considerations

There are a number of caveats to our analysis. First, the population size for our smallest bin—metropolitan area population under 100,000—is coarser than is desirable. It conflates places with considerably different sizes; there certainly must be a difference in access between living in a city of 90,000 and a remote village on the North Slope of Alaska. Further research that disaggregates small places would be of great interest.

Second, assigning trip purpose can be difficult, particularly with complex trip chains.

Third, our population resides in the United States, a country with advanced consumption opportunities, very high wealth levels, and a high degree of economic and social integration; far different results might be found when comparing life in a small village in Kenya to life in Nairobi (see below).

Fourth, our data do not permit us to address the knotty question of reverse causality and well-being; does out-of-home activity cause higher SWB, or the reverse? However, this is not a central question in this paper; the main question here is whether SWB covaries with city size. It is possible that those with more propensity to participate in activities, or who have higher SWB associated with activities, disproportionately locate in larger cities, or vice versa. This raises the question of self-selection into cities. We are unable to observe this potential effect; for example, those more likely to participate in arts/entertainment may be more likely to move to places like New York, elevating differences in activity time beyond what might be expected due to a strict “treatment effect” of the urban environment on behavior (Pinjari, Bhat, & Hensher, 2009). Thus, we cannot state with full confidence that a resident of Seneca would nearly double her participation in arts/entertainment were she to move to New York. Similarly, it is possible that those who enjoy arts and entertainment more would be more likely to locate in New York rather than Seneca, so that elevated enjoyment during these activities on the part of the New Yorker may result not from the activity being superior but from the individual intrinsically liking these activities more.

We have three responses to this issue. The first is to note that intra-metropolitan sorting is probably quite prevalent, so that when comparing, say, the walkability of neighborhoods, it is quite likely that residents who like to walk have moved to more walkable places within any given metropolitan area. However, inter-metropolitan sorting, particularly based on consumption amenities, is far more limited (Kemeny & Storper, 2012). The Pew Research Center (2008) finds that 37 percent of American adults have never lived outside of the town in which they were born, and a further 20 percent have switched towns but never left the state in which they were born. For most Americans, inertia determines metropolitan area location.

Moreover, the reasons given by individuals who do move are mostly unrelated to access to consumption opportunities. Forty-five percent said they moved for work or business, 29 percent for education or schooling, 18 percent for climate, and 35 percent for family ties. (Respondents were permitted to give more than one answer.) Two types of moves are most likely to be based on amenities. One is retirement (Y. Chen and Rosenthal, 2008), though this was cited as a motivating factor in only 13 percent of moves. The second is cultural amenities, but only 10 percent of respondents cited these as a reason that they moved, a very small number given that respondents were allowed to give more than one answer. In short, we are far from a world where everyone has perfectly sorted into an urban area that has the bundle of consumption opportunities they would prefer.

Moreover, self-selection would be expected to elevate differences between groups, not erode them. Thus, our finding of quite limited differences in lifestyle across metropolitan area sizes is actually strengthened by possible self-selection—neither a treatment effect nor a self-selection affect appears to be causing substantial differences in activity patterns based on place size. Our one major difference, that of travel behavior, may in part be explained by self-selection; it may be that those who loathe spending long periods in their cars avoid moving to Los Angeles. We do not find it convincing, however, that this is typically a decisive factor that tips the question of relocation given the many other factors involved in moving.

Finally, in results not shown, we performed within-individual comparisons of affect during activities using fixed-effects panel regression to compare the three activities for which each respondent reported emotions. We did not find that large-metropolitan-area inhabitants performing out-of-home activities (such as arts and entertainment) are in any more (or less) elevated moods relative to their other activities than small metropolitan area respondents; were large cities filled with arts connoisseurs, one might expect large-metropolitan-area residents would experience more heightened positive mood during cultural events compared to their baselines during other activities. In sum, we find that self-selection is far from complete, and that in any event our main findings—that time use and well-being do not substantially differ across activities based on metropolitan area size—are actually buttressed by potential self-selection, not weakened by it.

Fifth, we also note that we do not consider people's productive lives, at least beyond examining time spent at work, affect during work, and the life satisfaction related to work time, for all of which we do not find metropolitan area size to be relevant. However, large metropolitan area salaries tend to be higher, even taking cost of living into account (Kemeny & Storper, 2012). In a sense, large metropolitan area residents may be trading off money for (travel) time. It is of interest, however, that models we ran that did not include income as a control variable, which should allow higher large-metropolitan-area wages to contribute to SWB, still show that metropolitan area population is unrelated to life satisfaction.

Given the findings here—that metropolitan area size has limited relevance for activities, consumption opportunities and patterns, and life quality, and that it is major detractor for access in terms of travel time—it remains to be explained why other authors have found that large and high-amenity places are superior in terms of consumption. One explanation is that others such as Glaeser et al. (2001) use population growth or real estate prices as a proxy for quality of life, while we measure quality of life more directly. The different findings gleaned from these approaches might be reconcilable in light of research by Schkade and Kahneman (1998), which examines the attitudes toward happiness of Californians and Midwesterners. In their survey, both Californians and Midwesterners believed that people in California were much happier, but when asked about their own happiness, Californians and Midwesterners gave very similar scores. Thus, it may be that people think the lives of residents of New York and Los Angeles are far more exciting, and although we have argued that migration based on consumption opportunities is fairly rare, it is possible that some may move to these cities based on this conception. But when they arrive, they may find that the reality is that their daily life patterns are not dramatically different. Or, it is possible that the in-migration into larger places is due to superior productive opportunities (work), not consumption ones, although Glaeser and Gottlieb (2006) find this is not the case.

A number of additional topics suggest themselves for future research. One is the relationship between metropolitan area size and in-home activities. Given our finding that large- and small-place dwellers have roughly the same amount of out-of-home activity time, but with a considerable difference in travel time, it would be worthwhile to see how individuals reduce their in-home activities in populous places. We plan to address this in future research.

Second, this paper does not consider differences in access within cities, though again we plan to address this in future research. Third, it would also be fruitful to extend this analysis internationally, particularly to places in the developing world where breakneck urbanization is currently taking place but also to other nations in the developed world. In other nations, differences in urban form, density, and transportation infrastructure may result in fundamental differences in travel patterns and the accessibility levels associated with city size, and differences in culture, demographics, and income may have resulted in varying values assigned to time, money, and the worth of various activities. For example, it is the norm in many European nations to have longer vacations and accept lower real wages than in the US; this may indicate that these cultures place more value on time and less value on money, which may affect activity levels or the SWB reaped from activities. We plan to examine this using time use surveys from other nations.

Finally, it would be of great interest to examine how activity patterns have changed across geographies over a broader period of time. Fifty years ago in the U.S., small city residents might have suffered from access deprivation due to a variety of reasons: the high cost of long-distance telephone calls and airline tickets; the fragmentation of media markets; the paucity of television channels and the lack of a tool for viewing video recordings; very limited local shopping; and much else. Today, however, the large increase in franchise and chain shopping and dining, the fantastic wealth of information available over the Internet, inexpensive airfares, cable television, long-distance telephony with a marginal cost of zero, and much else may have dramatically eroded the difference in amenities across places in the U.S., not the opposite. In terms of consumption, over time smaller places may have become much more competitive with larger ones, not less so.

In sum, except for a possible trade-off between travel time and money, which in any event our data suggest is not consequential for overall life satisfaction, bigger may not be better, or even all that different.

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