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A Reconsideration of the Relationship Between Town Size and Well-Being in Latin America

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Abstract

In this study, we explore the relationship between town size and subjective well-being (SWB) in Latin America. We utilize data from the *Latinobarómetro* survey from 2005 to 2015, employing multilevel modeling to analyze individual responses to life satisfaction as an indicator of SWB. We refine the town size categories provided in the *Latinobarómetro* by cross-referencing the geographic information with the United Nations Demographic Yearbook, one of our main contributions, leaving us with more refined town size categories than previous research. Given previous theories, we also explore how education moderates the town size-SWB relationship. Our findings reveal that individuals in towns with populations between 10,000 and 500,000 report lower life satisfaction compared to those in smaller or larger towns. Controlling for national macroeconomic conditions reverses the positive association between SWB and living in a very large city. Furthermore, we find some support for the notion that highly-educated individuals are more satisfied than the low-educated in large cities. This study comprehensively underscores the importance of refining town size data and suggests avenues for future research to deepen collective understanding of the 'geography of happiness' in Latin America.

Keywords Life satisfaction · Subjective well-being · Education · Town size · Latin America · *Latinobarómetro* · Multilevel modelling

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Introduction

> "Happiness? I have never come across a more foolish word, invented by all those unfortunate girls from north-eastern Brazil."
>
> Clarice Lispector, *the Hour of the Star*

Like the girls from north-eastern Brazil, a relatively poor area of that country, economists are also interested in happiness, an interest that includes the happiness of the girls from north-eastern Brazil and many other people in many other regions of the planet. The geography of happiness is a growing area of inquiry; however, it is one that has received much less attention than others, like income, unemployment, and age. Over the past couple of decades, researchers have drawn increasing attention to the relationship between well-being and the size of the place where people live (e.g. Ballas, 2013; Qin et al., 2014; Piper, 2015a), however, an inconclusive picture has emerged. Larger cities may offer more diverse opportunities and resources, which can positively impact certain dimensions of well-being, such as economic opportunities, access to services, and cultural amenities (Florida, 2002). Despite this, in developed economies, there has been a discernible trend that the average level of subjective well-being (SWB) of individuals residing in rural areas exhibit higher levels of subjective well-being compared to those living in big cities (Burger et al., 2020). Similarly, it is observed that subjective well-being decreases with increasing population size, as shown in a study by Okulicz-Kozaryn (2017). This pattern deviates from the conventional belief that SWB increases with production and consumption advantages, and has often been referred to as the *urban paradox* (Morrison, 2020).

A note of caution with respect to some of this work is how town size is captured. The largest categories, often containing everywhere with at least 100,000 citizens. Switek (2012), in her study of place and well-being in Latin America, makes use of four waves of the *Latinobarómetro* and has the following town size categories: less than or equal to 5,000; 5,000 to 40,000; 40,000 to 100,000; and above 100,000 (which includes capital cities). Studies that use the *Latinobarómetro* alone do not have much choice regarding this large group categorization.[1] The town size data in these datasets are limited capturing, for example, Rio de Janeiro (just over six million inhabitants in 2024) and Florianopolis (just over 400,000 inhabitants) in the same category. While they both have beautiful beaches, they are very different places. Many further examples could be given; Brazil alone has 200 cities with a population of more than 100,000 with 15 of them having more than one million inhabitants. This issue is tackled in our study by merging UN Population data with

[1] The World Values Survey does split the above 100,000 category, offering an additional distinction between above and below half a million inhabitants. Some Latin American Gallup polls are similarly afflicted with, for example, Guardiola and Rojas (2016) report that the 2007 Gallup survey was implemented in four different regions: (1) A rural area or on a farm, (2) a small town or village, (3) a large city and (4) the suburb of a large city.

information from the *Latinobarómetro* capturing more refined town size groups and, as shown below, this refining is important.[2]

Against this background, we analyse the relationship between SWB and town size by using micro-data from the *Latinobarómetro*, which is a near annual, broadly representative, household survey across 18 Central and South American countries. Our contribution to this is our aforementioned consideration of more refined city size data, which we undertake by cross-referencing the geographic information in the *Latinobarómetro* with the United Nations (UN) Demographic Yearbook over several years and several countries. Thus, as well as adding to the small amount of research regarding SWB in Latin America, our study is better able to address any differences in town sizes above 100,000 by not capturing them all in one category. Additionally, we investigate the relationship between town size and subjective well-being (SWB) in several Latin American countries, while considering individual characteristics and country-specific economic factors. Since individuals are nested within cities which are nested within countries, we employ multilevel modeling to account for the hierarchical structure of the data and use an individual's response to a single-item question about life satisfaction as an indicator of SWB.

Our study also investigates any heterogeneity in the overall results by three broad education categories. In doing so, we are examining Morrison's (2024) notion of a differential in big cities by education. The basic idea is that those with higher levels of education are better able to take part in the production and consumption benefits of big cities (Morrison, 2018). Evidence for this conjecture for many Western European country data was found by Migheli (2017), who concluded that: "(i) [life satisfaction] increases with education but decreases with the size of the town and (ii) for a given size of town, education helps people to offset the negative characteristics of large settlements" (p. 201). However, here too, there were limitations with respect to town size categorization: his two most populous town size categories were 50,000 to 500,000 and above 500,000. An investigation of the potentially important role of education for the enjoyment of life in big cities has not, until now, been tested for Latin America.

The remainder of the article is set out as follows: Section 2 provides a literature review which starts with a summary of the developed world research regarding the relationship between place and well-being, before moving on to Latin America; Section 3 explains the data and the method; Section 4 presents the results; and Section 5 contains the study's limitations and some avenues for future research; finally, Section 6 briefly concludes.

SWB and Town Size — Previous Empirical Evidence

With US General Social Survey data, Okulicz-Kozaryn (2017) investigated subjective well-being by town size and found that SWB decreases with the size of town, especially when population exceeds several hundred thousand. He claims that these

[2] This is also the case for research that investigates town size in other areas. For example Prati (2023), in a recent valuable contribution to this area of research, has an upper category of 500,000 and above. This means that, for example in Germany, Berlin and Hannover, two very different cities, are considered the same.

results suggest that some cities can simply be too big, supportive of the general idea of an urban paradox. In general, these results for large cities are similar to those found from one of the world's two most populous countries and with about two thirds of its inhabitants living in urban areas, China: people become less satisfied in places with a population larger than 500,000, and report the highest levels of well-being in places with a population between 200,000 and 500,000 (Chen et al., 2015). More recently, Dang et al. (2020), with an analysis of 44 Chinese cities, used structural equation modelling and found an inverted U-shape relationship with the highest average life satisfaction levels at about one million inhabitants. They stated that both environmental pollution and traffic congestion are implicated in the lower average life satisfaction scores reported by the inhabitants of the very large cities (i.e. with populations above the comparison group whose population is around one million). Zhao et al. (2019), using Chinese Census data as well as data from Weibo (the Chinese X/Twitter), broadly support this non-linear conclusion regarding city size and well-being.[3]

Inspired, in part, by Simmel (2006/1903) whose theories about big city life predict some dissatisfaction and unhappiness and thus would not view urban unhappiness as a paradox, Piper (2015a) used four rounds of the European Social Survey (ESS), and found that for some European countries, living in bigger cities, and especially capital cities, was associated with lower levels of SWB. In some instances, these differences in SWB were related to systematic differences regarding the fear of crime (Piper, 2015a). Using the Finnish sample from the ESS, Morrison and Weckwroth (2018) also found that metropolitan areas were associated with, on average, lower levels of well-being than other areas, and that extrinsically motivated Finns are less happy than their intrinsically motivated compatriots. Given these findings, he suggests that Finns who are extrinsically motivated are more attracted to metropolitan areas, therefore perhaps providing an additional reason for the lower average SWB found in big cities.

Furthermore, MacKerron and Mourato (2013) focused on the natural environment and provided evidence that people are more satisfied if they do not live in an urban environment but instead reside in close proximity to green areas. This is attributed to the fact that urban environments are typically characterized by adverse environmental conditions, such as higher air pollution, temperatures and noise levels (Gidlöf-Gunnarsson and Öhrström 2007). People living in bigger cities are exposed to much traffic which comes with increased air pollution and noise, and which, in turn, causes health problems and negatively affects well-being (Bluhm, Nordling, and Berglind 2004; Welsch, 2006; Luechinger, 2009). Other reasons for the oft-found preference for smaller areas, include the principle of "generalized reciprocity" (Putnam, 2001), in which community members look out for each other, and which may be less prevalent in more highly populated areas.[4] The quality of life within various communities, as well as a discussion of those communities, in Latin America

[3] Alternatives to town size have been investigated, for example urban sprawl(Mouratidis (2019).

[4] John Stuart Mill would perhaps not be surprised by such arguments having listed the following 'disagreeable symptoms of social life during the industrial revolution: "trampling, crushing, elbowing, and treading on each other's heels" Mill (2004/1848).

has been investigated in different chapters of Tonon (2017). In general, these results suggest that while there may be economic –such as production and consumption— benefits to living in large urban areas, other factors play an important role for our well-being.

More recent research, often with relatively small sample sizes, show results that do not support a general pattern for the relationship and emphasise the need for context-specific studies. Želinský et al. (2021) use two waves of EU-SILC data and find that population density is positively associated with well-being in Slovakia. They note that their results are different from other findings and highlight that Slovakia is a largely rural country which may be responsible for the results. Additionally, we note that its capital, Bratislava, and most populous city, had, in 2023, approximately 440,000 inhabitants. This is clearly not a 'megacity', and likely does not suffer from the overcrowding common to such places perhaps partly behind the oft-found negative association with town population size and well-being (as detailed above).

Focusing on a comparison between rural and urban areas in Germany from 1998 to 2012 with data from the German Socio-Economic Panel (SOEP), while simultaneously considering regional indicators, Jantsch, Wunder, and Hirschauer (2016) show that life satisfaction of the population in rural areas is lower than that of the urban population. This particularly holds for the former East Germany. However, the difference in life satisfaction levels between rural and urban populations compared to other demographic cohorts (e.g., married/unmarried, employed/unemployed) is notably small. Similar to Želinský et al. (2021), their classification of rural and urban areas emphasizes population density as the determinant rather than the size of the area.[5] Viganó et al. (2019) investigate rural-urban differences in Italy. Their analysis of cross-section data demonstrates a premium for rural areas, which they define as any area with less than 5,000 inhabitants.[6]

Recently, Prati (2023) has used both the European Values Survey and World Values Survey (WVS) to analyse the relationship between town size and life satisfaction, and town size and happiness with only slight differences in the findings for the two SWB measures. For Europe, he uncovers lower life satisfaction for those who live in places with more than 20,000 inhabitants and lower happiness for those who live in places with more than 100,000 inhabitants. For the WVS, the results were a bit more inconclusive, with individuals in places with more than half a million inhabitants less happy than those in very small places. There is a drawback with the analysis of Prati (2023), shared by most of the other studies which use these datasets: there is no distinction made between areas with more than 500,000 inhabitants, conflating megacities with areas that are multiple times less populous. Such a conflation means that results such as those of Dang et al. (2020) cannot be tested.

[5] To operationalize rurality, Jantsch, Wunder, and Hirschauer (2016) define districts (*Kreise*) with a population density below 150 inhabitants per square kilometer as rural districts. Districts with a population density above 150 inhabitants per square kilometer are defined as urban districts. In a similar study, Jantsch and Hirschauer (2021) show that life satisfaction in rural West Germany surpassed that of urban populations between 2012 and 2014. A similar trend was observed in the eastern part of Germany, where life satisfaction in rural areas marginally exceeded that of urban areas for the first time in 2014.

[6] In contrast, urban areas are classified as any area with an inhabitant count of more than 200,000. A large, diverse category containing Venice and, ten times as populous, Rome.

Well-being in Latin America is generally less researched than well-being in many other areas. As pointed out by Moyano Díaz (2016, p. 80): "The research field of happiness and positive psychology or the economics field of happiness or well-being, which are the usual fields of study, are relatively new fields in the occidental world and even newer in Latin America. The scientific production by Latin American authors on happiness in indexed journals (WoS and SciELO), yielded 44articles from the countries in this continental region and in the 12-year period taken into consideration." This general pattern is changing, and the well-being of Latin Americans is receiving more attention from academics, both the region as a whole (Ahmed Lahsen and Piper, 2019; Macchia and Plagnol 2019; Rojas, 2023) as well as individual studies (Piper, 2019; Briseño, Maisterrena, and Soto-Pérez (2024), though studies into the 'geography of happiness' are still sparse.[7] Lora (2010), using the seventh wave of Gallup World Poll data, found that most of the Latin Americans state being satisfied with their cities (80%); people living in Guatemala report the highest satisfaction rates (93%) and people living in Haiti (49%) and Peru (7%) the lowest.

Prior research regarding town size and well-being in Latin America is rather sparse and, like that for similar developed country research, the current picture is rather inconclusive. Latin America is an interesting and worthwhile region to study for other reasons in addition to the relative paucity of regional investigations. Over the last 60 years, a growing and, compared to other regions, rapid urbanisation has taken place in Latin American countries (Lora, 2010). This is confirmed by other sources like the United Nations who stated that, in 2005, 77% of the ppulation in Latin America and the Caribbean lived in urban areas (United Nations, 2006, 3). Case studies about the region's recent urban transformation are also available for some of the area's leading cities (Leite et al., 2020). Among the reasons given for this rapid urbanisation are the higher poverty rates in rural areas compared to urban areas; in turn, this is argued to be because of very low levels of productivity, wages and formal education due to, among other things, poor social protection systems and a high degree of informality (Weller, Reinecke, and Lupica 2016, 5). In urban areas, it was both easier and cheaper for the government to provide public goods such as health and education services because they reach more people at once (Rojas und García Vega 2017: 225), which has been argued to lead to a more equal distribution of human capital and reduced (income) inequality (Lustig, Lopez-Calva, and Ortiz-Juarez 2013). Furthermore, for both rural and urban areas, the unemployment rates increased substantially because the labour supply in the cities does not fit with the skills of the rural migrants who were predominantly trained in agriculture (Rojas and García Vega 2017, 225).[8]

[7] Of note for this increased academic attention regarding wellbeing in Latin America are the chapters of Rojas (2020).

[8] Such comments are also reflected by the OECD's interest in well-being in Latin America, where urbanization is specifically mentioned as a well-being issue linked via vulnerability for the region's emerging middle class (OECD 2021). Several years of the OECD's Latin America and The Caribbean reports highlights similar concerns. From the 2022 report: Latin America and the Caribbean's "rapid urban transition stimulated furthermore urbanization (p. 246), and that there is a greater prevalence of disadvantaged groups in rural areas is also mentioned in the OECD's 2017 Latin American Economic Outlook which focused on youth, skills and entrepreneurship (OECD/CAF/ECLAC (2016). The sustainability aspects of this rapid urban transformation were also considered by Romero-Lankao and Gnatz (2013).

With respect to further Latin American studies, Graham and Felton (2006) distinguished between small (< 5,000 inhabitants), medium, and large cities (> 100,000 inhabitants), a category that also includes capital cities, and found that, when controlling for nationality, individuals report higher levels of life satisfaction in smaller places than in big cities (Graham & Felton 2006, 114). With similar categories, but later years, Ateca Amestoy, García-Muñoz, and Moro Egido (2016) find that living in a capital city has a negative effect on life satisfaction, while people who live in small cities are more satisfied with their life than people in large urban areas. In general, Switek (2012) finds the same. In contrast, Valente and Berry (2016) report no statistically significant differences regarding happiness between urban and rural dwellers (which they capture via six different town population size categories). There are seemingly no other multi-country studies from the Latin America region at the time of writing. Thus, existing data seems to offer some support to the idea of an urban paradox where, as discussed in the introduction, there are production and consumption-based reasons to expect more well-being but less is found. This research also seems to confirm the urban-rural gradient discussed by, amongst others, Berry and Okulicz-Kozaryn (2011).

In Morrison's (2024) conceptual framework, the arguments regarding why education acts as a moderator between town size and well-being revolve around three key factors: social engagement, socioeconomic status, and spatial clustering. He emphasizes the critical role of social engagement in determining well-being: Social contact improves well-being, but the relationship is nonlinear—well-being increases with social contact up to a point, after which the benefit of additional contact diminishes. Moreover, education is a major driver of socioeconomic status, and those with higher education (especially those with tertiary qualifications) typically enjoy more social engagement. Morrison (2024) references Bradburn (1969) to highlight that individuals with higher socioeconomic status, particularly those with tertiary education, experience a greater variety and intensity of social activities, both formal and informal. Last but not least, education also interacts with spatial clustering in urban settings. In large metropolitan areas, educated individuals tend to benefit more from their environment due to higher incomes, better access to resources, and the ability to increase social contact with other educated individuals. This spatial clustering leads to enhanced material and non-material returns for the tertiary educated, which in turn raises their well-being more than for the non-tertiary educated, who may experience a relative decline in well-being in metropolitan areas due to fewer social contacts and lower access to resources. In essence, education may determine how town size affects well-being.

Data and Method

To analyse the relationship between SWB and town size we use micro-data from the *Latinobarómetro*, which is a near annual, broadly representative household survey across 18 Central and South American countries.[9] It provides detailed information

[9] Graham (2009) describes the dataset and considers it representative for all these countries apart from Chile, Colombia and Paraguay. See, particularly, footnote 7 in Chap. 3.

on both the socio-demographic and socio-economic characteristics of respondents. The samples for each year comprise between 1,000 and 1,200 individuals. Our comprehensive dataset spans 12 Latin American countries –Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Nicaragua, Panama, Paraguay, Peru, Uruguay– and includes data from 1,700 cities, covering the period from 2006 to 2015. We could not use all 18 countries because of the UN Demographic Yearbook data which we use to refine the population categories.[10] Overall, we end up with a sample of 104,282 observations, which consists of approximately 8,700 observations per country and 60 observations per city.

We use an individual's response to a single-item question about life satisfaction as an indicator of SWB. This question specifically asks individuals 'Generally speaking, would you say you are satisfied with your life? Would you say you are….?' with the respondent being offered four choices: very satisfied, quite satisfied, not very satisfied, or not at all satisfied. In the appendix, the top part of Table A1 gives the percentages for the different responses to the life satisfaction question in each country for the years of the Latinóbarometro we use.[11]

To analyse the relationship between town size and life satisfaction, we proceed stepwise. Firstly, we simply estimate the relationship between life satisfaction and town size, controlling for the year – step 1. This raw, almost fully unadjusted picture provides basic information and the basis for the latter, more nuanced understanding of this relationship. Step 2 adds the following standard socio-economic controls: age, gender, marital status, subjective income level, level of living, education, employment status, and the specific year of observation, giving a more refined picture of the relationship between town size and life satisfaction and a point of comparison with the raw unadjusted picture. Step 3 adds to this the following individual country economic characteristics: GDP; GDP per capita, the change in GDP, unemployment rate, and inflation rate[12].

Since the data structure involves repeated cross-sectional data where different individuals are nested within cities which are nested within countries, we employ multilevel modeling to account for the hierarchical structure of the data. Multilevel modeling outperforms classical regression in efficacy and particularly its predictive accuracy (Gelman, 2006). Moreover, it allows us to fit a regression model to the individual measurements of life satisfaction while accounting for systematic unexplained variation among the 1,691 cities and towns in our dataset. These models have been employed and explicitly endorsed in the 'geography of happiness' by, for

[10] For the missing countries, accurately matching up city data between the UN Demographic Yearbook data and the *Latinobarómetro* was not always possible. In such cases, there was ambiguity regarding whether the population data provided in the UN Demographic Yearbook pertained to metropolitan areas or –what we were looking for— individual cities and towns.

[11] With the exception of 2008, the life satisfaction question is asked at the start of the survey; in 2008 it is in the middle immediately after questions asking about politics. Given the likely influence of the preceding questions (Fox and Kahneman (1992); Diener, Inglehart, and Tay (2013)), we estimate and without the 2008 data. Since the results do not differ, we show them including the 2008 data.

[12] These data come from the World Bank, with GDP per capita being captured by constant prices (2011 US$).

example, Ballas and Tranmer (2012), Pittau, Zelli, and Gelman (2010), and Schyns (2002).

We use a 3-level random intercept ordered probit regression model due to the ordered responses in our dependent variable to explain *SWB* of individual i in city j within country k. Here is the equation for Step 3:

$$SWB_{ijk} = \beta_0 + ts_{jk}\beta_1 + \gamma' \mathbf{x}_{ijk} + \delta' \mathbf{z}_k + u_{0j} + v_{0jk} + \epsilon_{ijk}$$

The variable *ts*, which is explained in more detail in subsection 3.1, indicates the town size of the place an individual is living in. The vector **x** in our analysis encompasses individual-level control variables, comprising important demographic and socioeconomic characteristics listed above, though a note on income is necessary.[13] Rather than data on individual or household income, data in the *Latinóbarometro* is subjective with individuals responding to a question asking if they think their personal economic situation is very good, good, about average, bad, and very bad. We use also the rating of the interviewer about the individual's economic situation; a judgement based on how the respondent looks, as well as their furniture and home.

Vector **z** consists of variables at the country level also listed just above. The incorporation of both individual and country-level variables allows for a comprehensive examination of the multifaceted factors influencing the dynamics between SWB and town size in our study. Table A1 and Table A2 in the appendix present descriptive statistics of all variables included in the analysis for the Latin American region and individual countries from 2006 to 2015. Data is provided for each variable across all included countries, allowing for a comprehensive overview of the population and country characteristics during the specified time period.

The parameter β_0 represents the overall intercept capturing the overall mean SWB; u_{0j} is a random intercept for each city capturing the city-specific mean SWB; u_{0j} represents the random intercept for each city, j, capturing the city-specific mean SWB; v_{0jk} represents the random intercept for each country, k, capturing the country-specific mean SWB. β_1, δ and γ are the parameters to be estimated, and ϵ is the remaining independently and identically distributed (IID) error term.

Given the discussion in the literature section, we also briefly consider the potential moderating factor of education. Recall that the basic idea is that those with better education are better able to take advantage of the amenities and opportunities urban areas provide (Morrison, 2018). Thus, we distinguish three education categories in our dataset. Individuals classified under the *low education* category include those who are illiterate, have incomplete or completed primary education.

[13] Given the conjecture raised by immigrants by Berry and Okulicz-Kozaryn (2011) we also considered the inclusion of a dummy variable for migration status. This does not feature in our main results because it is not included in the *Latinobarómetro* for all of the years of our sample. Furthermore, the closest question to considering migrant status is a question asking if the respondent is a citizen of the country they are interviewed in. Less than 2% of our sample is comprised of, judged in this way, non-citizens and they do not appear to be much different from the citizens. Indeed, when we include them, accepting the loss of data involved, the few changes in the results stem from the fewer years of data rather than the inclusion of a citizen control. With so few citizens, and the loss of data, we cannot provide evidence for or against the speculation of Berry and Okulicz-Kozaryn (2011).

The *medium education* category encompasses individuals with incomplete or those who have successfully completed secondary education by obtaining a high school diploma or its equivalent. Highly educated individuals, according to our classification, fall under the *high education* category if they have incomplete or successfully completed higher education provided by universities, colleges, and other higher education institutions, the top two education categories in the *Latinobarómetro*. We split the sample into these three education categories and repeat the three steps of our estimation procedure as detailed above. Additionally, we then briefly investigate the potential moderating factor of education with interaction terms combining the various town size categories and these three education levels.

Definition and Refinement of Town Size Categories

The *Latinobarómetro* provides information on the size of the town in which an individual resides. This information indicates whether an individual lives in an area with less than 5,000 individuals, between 5,000 and 10,000, and other variously sized groups until the last one: above 100,000 (see Table 1). Previous studies have relied on the category definition of the main dataset used, which has led to very large and poorly refined city size categories. In the case of the *Latinobarómetro*, for example, all cities except the capitals that have more than 100,000 inhabitants fall into the same category. This implies that a town with a population of just over 100,000 people is not distinguished to one of Latin America's non-capital megacities. And the capital megacities themselves are grouped with the much smaller capitals of the smaller Latin American countries which can have overall national populations considerably smaller than the megacity capitals. This conflation of all capital cities into one category, and all non-capital cities with a population of at least 100,000 involves an implicit assumption that these places are similar, which is extremely unlikely. In contrast, it is hard to deny that there are major differences between, for example, Brazilian cities and towns with a population of just over 100,000 and the megacity of Sao Paolo, with its approximately 12 million inhabitants. Such places should not be considered in the same town size category as previous research does. Given that this

Table 1 Town size categories within the *Latinobarómetro* and more refined categorisation of town size

	Latinobarómetro categories		Our categories	
	No of inh.	No of obs.	No of inh.	No of obs.
1	Up to 5,000	8,519	Up to 10,000	14,182
2	5,001–10,000	5,663	10,001–50,000	29,932
3	10,001–20,000	10,129	50,001–100,000	11,258
4	20,001–40,000	14,390	100,001–250,000	12,999
5	40,001–50,000	5,413	250,001–500,000	8,974
6	50,001–100,000	11,258	500,001–1,000,000	6,122
7	100,001 and more	29,246	1,000,001–5,000,000	13,468
8	Capital	19,664	5,000,001 and more	7,347

Source: Latinobarómetro, United Nations Demographic Yearbook

equal treatment of cities of different sizes (above a minimum population of 100,000) in the analysis may lead to false conclusions regarding the relationship between subjective well-being and city size, we refine the size categories for the cities by taking additional city size information into account. To do this, we merged data from the UN Demographic Yearbook in order to refine the town size data for our 13 Latin American countries, a substantial though necessary undertaking. Following this, there are over 1,691 different location-year combinations for the analysis.[14]

Table 1 shows the original town size categories compared with those we have created. The new categories, ranging from "Up to 10,000" to "5,000,001 and more," offer a broader spectrum than those of prior research that uses the original categories without modification. Notably, the old town size category "Capital" posed a significant limitation as it failed to convey information about the actual population size of the respective capital cities where people live. By subdividing the categories based on more refined population thresholds, the new system enables us to conduct more precise analyses and better understand the dynamics of town size and SWB in Latin America.

Sample Descriptives

Table 2 provide insights into the distribution of various socio-demographic and socio-economic variables across the surveyed population from 2006 to 2015. In this sample, approximately 26.4% of respondents reported being very satisfied with their life, while 44.8% indicated they were fairly satisfied. A smaller portion, 25.3%, said they were not very satisfied, and only 3.5% reported being not at all satisfied with their life. Table 2 also provides information regarding income, socioeconomic status, gender which is almost evenly split, marital status, education, and employment status. Age is not in Table 2, however this sample shows a mean age of the respondents of 40.18 years with a standard deviation of 16.55 years.

In the Latin American context, the percentages displayed in Table 3 point to a correlation between education levels and the distribution of population across different town sizes. It indicates that those with low education are, overall, more likely to reside in areas with smaller populations, particularly with over half of the low educated living in areas with less than 50,000 inhabitants. In contrast, this is just under 35% of those with a medium level of education and just under 25% for those with a high level of education. As the table also shows, the respective percentages for places with populations of over a million demonstrate a pattern commensurate with these figures: 13% low; 25%medium; and 31% for those more highly educated.

Table 4 shows that there is no clearly discernible pattern of life satisfaction associated with the size of the town, suggesting that factors other than number of inhabitants may play a more prominent role in explaining individuals' SWB in relation to town size. Interestingly, Table 4 does highlight a potential association between higher educational attainment and increased life satisfaction among respondents,

[14] Due to small cell sizes for the lowest population categories for some countries we merged the bottom two town size categories.

Table 2 Descriptive statistics of individual characteristics included in the analysis for the Latin American region from 2006 to 2015

Variable	All countries
Life satisfaction	
very satisfied	26.4%
fairly satisfied	44.8%
not very satisfied	25.3%
not at all satisfied	3.5%
Income categories	
sufficient income	9.3%
just sufficient income	41.9%
insufficient income	36.8%
very insufficient income	12.0%
Socioeconomic level	
very good	7.3%
good	33.5%
not bad	43.4%
bad	13.4%
very bad	2.5%
Gender	
male	48.7%
female	51.3%
Marital status	
single	30.5%
partnered or married	57.9%
separated, divorced or widowed	11.6%
Educational level	
illiterate	8.0%
incomplete primary education	21.1%
primary education	15.7%
incomplete secondary education	16.1%
secondary education	21.8%
incomplete higher education	8.7%
complete higher education	8.7%
Employment status	
employed	25.3%
self-employed	32.9%
unemployed	5.6%
retired	7.2%
not in labour market	22.7%
student	6.2%
Number of Observations	104,282

Source: Latinobarómetro

Table 3 Town size categories by education levels in Latin America – share of population (in %)

Town size category (inhabitants)	population (%)			
	all	level of education		
		low	medium	high
(1) up to 10,000	13.6	17.3	12.3	6.8
(2) 10,000 to 50,000	28.7	36.5	24.3	18.4
(3) 50,001 to 100,000	9.8	11.0	9.4	7.6
(4) 100,001 to 250,000	12.8	11.0	13.4	16.0
(5) 250,001 to 500,000	8.9	7.0	9.9	11.7
(6) 500,001 to 1,000,000	5.9	4.7	5.9	8.9
(7) 1,000,001 to 5,000,000	13.3	9.4	15.9	17.6
(8) more than 5,000,001	7.1	3.1	9.0	13.0
No of observations	**104,282**	**46,722**	**39,437**	**18,123**

Note: low education category: illiterate, incomplete or completed primary education; *medium education* category: incomplete or completed secondary education; *high education* category: incomplete or completed higher education

Source: Latinobarómetro, United Nations Demographic Yearbook

hinting that education could potentially moderate the relationship between SWB and town size. Contrary to prior expectations established in the literature, Table 4 also shows that the returns in SWB within larger cities do not exhibit an elevation for individuals with higher education levels (compared to other town sizes). Supporting the literature review in Section 2, and common-sense conjecture, this table also

Table 4 Life satisfaction and town size by education levels in Latin America -- people who are very/quite satisfied (in %)

Town size category (inhabitants)	People who are very/quite satisfied (%)			
	all	level of education		
		low	medium	high
(1) up to 10,000	72.8	68.2	77.7	83.1
(2) 10,000 to 50,000	69.7	65.0	74.5	80.0
(3) 50,001 to 100,000	75.0	71.7	76.5	82.7
(4) 100,001 to 250,000	69.4	64.9	70.0	76.1
(5) 250,001 to 500,000	75.1	71.5	75.6	79.7
(6) 500,001 to 1,000,000	66.2	58.5	68.2	73.8
(7) 1,000,001 to 5,000,000	72.1	62.3	74.0	81.9
(8) more than 5,000,001	69.3	61.4	67.2	77.5
No of observations	**104,282**	**46,722**	**39,437**	**18,123**

Note: low education category: illiterate, incomplete or completed primary education; *medium education* category: incomplete or completed secondary education; *high education* category: incomplete or completed higher education

Source: Latinobarómetro, United Nations Demographic Yearbook

demonstrates the wisdom of not considering everyone who lives in a town or city of at least 100,000 people as the same.

***Results

In this section we present the results from all three steps of our analysis, offer reasons for the found changes in the relationship between town size and life satisfaction, and uncover potential next steps for subsequent research. Results in Table 5 provide insights into the relationship between town size and life satisfaction for the countries in Latin America under consideration and for different education levels. The reference category is "up to 10,000," and thus the coefficients represent the change in life satisfaction for respondents in various town size categories compared to this reference. The regression coefficients presented in Column 1, which displays the results without controlling for individual and regional characteristics, reveal a clear pattern: Individuals living in cities with more than 10,000 inhabitants are predicted, on

Table 5 Life satisfaction and town size in Latin America – Regression results from a 3-level random intercept model for the whole Latin American region

VARIABLES	(1)	(2)	(3)
Town size categories (ref.: (1) up to 10,000 inh.)			
(2) 10,001–50,000 inh.	−0.034 **	−0.053 ***	−0.047 ***
	[0.016]	[0.015]	[0.016]
(3) 50.001–100.000 inh.	−0.024	−0.068 ***	−0.076 ***
	[0.021]	[0.019]	[0.021]
(4) 100.001–250.000 inh.	−0.044 **	−0.077 ***	−0.090 ***
	[0.021]	[0.021]	[0.022]
(5) 250.001–500.000 inh.	−0.064 ***	−0.141 ***	−0.138 ***
	[0.022]	[0.024]	[0.025]
(6) 500.001-1.000.000 inh.	0.100 ***	0.004	−0.006
	[0.027]	[0.030]	[0.036]
(7) 1.000.001–5.000.000 inh.	0.201 ***	0.042 **	−0.038
	[0.021]	[0.020]	[0.039]
(8) 5.000.001 and more inh.	0.186 ***	0.063 ***	−0.103 *
	[0.021]	[0.020]	[0.057]
Individual controls	no	yes	yes
Regional controls	no	no	yes
Fixed effect for the year	yes	yes	yes
No of Observations	**104,282**	**104,282**	**104,282**

*** $p<1\%$, ** $p<5\%$, * $p<10\%$. *Individual controls*: age, gender, marital status, subjective income level, level of living, education, employment status. *Regional controls*: GDP; GDP per capita, the change in GDP, unemployment rate, and inflation rate. *Latinobarómetro*, United Nations Demographic Yearbook, World Bank

average, to report lower levels of life satisfaction; a pattern that holds for cities with populations of up to 500,000. Beyond this threshold, the pattern reverses and, as cities grow larger, individuals are predicted to report higher levels of life satisfaction. Thus, a U-shaped relationship between city size and life satisfaction is observed, with individuals in areas with 200,001–500,000 inhabitants reporting the lowest levels of life satisfaction.

Once we control for individual characteristics (see column 2, Table 5), the negative pattern for small towns is similarly pronounced. Again, in cities with populations of between 10,000 and 500,000, the self-reported life satisfaction levels are predicted to be lower than in other places, everything else held constant. However, above 500,000 people, this negative association stops, and compared to the very small towns with populations below 10,000, life satisfaction is on average higher for people living in cities over 1 million inhabitants. This latter finding is different from that found by the previous regional studies cited in our literature review, indeed could not even be uncovered by them, and indicate that it is the largest cities in the examined Latin American countries that yield the greatest life satisfaction bonus.

One reason for this latter finding could be that the positive association between life satisfaction and very big cities is driven or at least underpinned by the national macroeconomic situation. While, when we additionally control for country-specific economic characteristics, such as real GDP per capita and the unemployment rate (column 3, Table 5), there is little qualitative change in the negative association between life satisfaction and city size up to 500,000 inhabitants, the signs of the coefficients for city sizes over one million inhabitants reverse, thus indicating a negative association between living in big cities and life satisfaction, although no longer statistically significant for the one to five million category. This could indicate that, for cities with over 1,000,000 inhabitants in Latin America, the economy of each country can explain individuals' satisfaction in these cities rather than living in a large city itself. For small towns, the economic performance of a country seems to be less relevant for an individual's life satisfaction, barely changing the obtained coefficients.

The sample's descriptive statistics indicated that, along the lines of Morrison's (2018) supposition, the respondents' level of education may moderate this overall relationship too. We assess this in two different ways: (i) subsamples based on education level; (ii) interaction terms combining the various town size categories and education levels. Thus, Table 6 shows the coefficients obtained in regressions for different subsamples that differ by education level. In each column, the full control set is employed, as in column 3 of Table 5. Taking each education group, and therefore column, in turn, the coefficients indicate that the low educated are less satisfied in all town size categories, compared to the base of less than 10,000; a result which is statistically significant for the categories up to 500,000 inhabitants and for the city size category encompassing all cities with more than five million inhabitants (column 1, Table 6). For the medium education subsample, the inhabitants of Latin American towns and cities between 100,000 and 500,000 are particularly dissatisfied with life, and there is practically no difference between below 10,000 and those areas above 500,000. For the high education subsample, we find no notable relationship between town size and life satisfaction except that life satisfaction is

Table 6 Regression results for life satisfaction on town size and education in Latin America obtained via sample splits

VARIABLES	(1) low education	(2) medium education	(3) high education
Town size categories (reference: (1) up to 10,000)			
(2) 10,001–50,000 inh.	−0.046 **	−0.023	−0.026
	[0.020]	[0.023]	[0.041]
(3) 50.001–100.000 inh.	−0.069 **	−0.036	−0.040
	[0.027]	[0.030]	[0.049]
(4) 100.001–250.000 inh.	−0.082 ***	−0.061 **	−0.061
	[0.029]	[0.029]	[0.045]
(5) 250.001–500.000 inh.	−0.100 ***	−0.093 ***	−0.120 **
	[0.034]	[0.034]	[0.050]
(6) 500.001-1.000.000 inh.	−0.025	0.020	−0.022
	[0.048]	[0.044]	[0.060]
(7) 1.000.001–5.000.000 inh.	−0.067	0.001	0.018
	[0.049]	[0.043]	[0.058]
(8) 5.000.001 and more inh.	−0.140 *	−0.035	−0.036
	[0.079]	[0.061]	[0.075]
Individual controls	yes	yes	yes
Regional controls	yes	yes	yes
Fixed effect for the year	yes	yes	yes
No of Observations	**46,722**	**39,437**	**18,123**

*** $p < 1\%$, ** $p < 5\%$, * $p < 10\%$. low education category: illiterate, incomplete or completed primary education; medium education category: incomplete or completed secondary education; high education category: incomplete or completed higher education. Individual controls : age, gender, marital status, subjective income level, level of living, education, employment status. Regional controls : GDP; GDP per capita, the change in GDP, unemployment rate, and inflation rate. *Latinobarómetro*, United Nations Demographic Yearbook, World Bank

lower, on average, in places with populations of between 250,000 and 500,000. We note that this, and most of our other results, could not be uncovered without the use of population data external to our main dataset. With respect to the previous negative coefficient for very large cities (column 3, Table 5), and found elsewhere, these results by education level subsample suggest that this finding is mainly driven by those with lower levels of education. In line with Morrison's supposition, individuals with lower education levels may have less access to the diverse offerings of large cities, as noted by Florida (2002) and others too, and may be more constrained by the generally higher cost of living. As discussed below, the analysis using interaction terms (see Table 7) provides further support for this supposition.

For a clearer picture, we also investigate these relationships with interaction terms. Thus, our model has, as well as the other controls, dummy variables for the various town sizes (town sizes (2) to (8), with the base category being town size (1), dummy variables for the various education levels (medium and high, with the

Table 7 Regression results for life satisfaction on town size and education in Latin America obtained via interaction terms

VARIABLES		
Town size categories (reference: (1) up to 10,000)		
(2) 10,001–50,000 inh.	−0.049 ***	[0.019]
(3) 50.001–100.000 inh.	−0.051 **	[0.025]
(4) 100.001–250.000 inh.	−0.111 ***	[0.026]
(5) 250.001–500.000 inh.	−0.112 ***	[0.031]
(6) 500.001-1.000.000 inh.	−0.032	[0.041]
(7) 1.000.001–5.000.000 inh.	−0.089 **	[0.042]
(8) 5.000.001 and more inh.	−0.119 *	[0.063]
Educational level (reference: (1) low education)		
(2) Medium education	0.030	[0.021]
(3) High education	0.110 ***	[0.036]
Interaction: town size and education (reference: (1) up to 10,000 * (1) low education)		
(2) 10,001–50,000 inh. * (2) medium education	0.006	[0.025]
(2) 10,001–50,000 inh. * (3) high education	0.006	[0.041]
(3) 50.001–100.000 inh. * (2) medium education	−0.040	[0.032]
(3) 50.001–100.000 inh. * (3) high education	−0.063	[0.049]
(4) 100.001–250.000 inh. * (2) medium education	0.036	[0.030]
(4) 100.001–250.000 inh. * (3) high education	0.055	[0.044]
(5) 250.001–500.000 inh. * (2) medium education	−0.027	[0.034]
(5) 250.001–500.000 inh. * (3) high education	−0.047	[0.047]
(6) 500.001-1.000.000 inh. * (2) medium education	0.048	[0.039]
(6) 500.001-1.000.000 inh. * (3) high education	0.055	[0.051]
(7) 1.000.001–5.000.000 inh. * (2) medium education	0.080 ***	[0.030]
(7) 1.000.001–5.000.000 inh. * (3) high education	0.099 **	[0.044]
(8) 5.000.001 and more inh. * (2) medium education	0.020	[0.040]
(8) 5.000.001 and more inh. * (3) high education	0.076	[0.051]
Individual controls	yes	
Regional controls	yes	
Fixed effect for the year	yes	
No of Observations	**104,282**	

base category being low), and interaction terms combining both. These results are presented in Table 7 and similarly indicate that individuals living in towns larger than 10,000 inhabitants tend to generally have lower life satisfaction compared to those living in towns with up to 10,000 inhabitants. Independent of town size, individuals with high education levels have, on average, statistically significantly higher levels of life satisfaction compared to those with low and medium education levels.

The interaction terms demonstrate no difference based on individual education level for living in any area with a town size below one million residents. However, our results indicate a premium for the medium and highly educated who live in areas with populations between one million and five million. We note that this premium for the highly educated in such areas is on top of the general life satisfaction premium that is associated with their high education level.

Limitations and Avenues For Future Research

Though valuable, every study that uses the *Latinobarómetro* has some inherent limitations; limitations in addition to the town size categories discussed above and, though important, not returned to here. These include the lack of useful subjective or objective health data. Not only is health repeatedly found as one of the most important factors for life satisfaction, individuals in different town sizes may have differing needs regarding, and abilities to access, health care. Unfortunately, the *Latinobarómetro* is not a panel dataset, and as is well-known, responses within repeated cross-section data may reflect different individuals being asked rather than any sense of change over time. Repeated cross-sections data means snapshots of different people taken at different times, and thus it is hard to assess change. Places grow at different rates and this might be systematically related to well-being; whether happier places in Latin America grow more quickly is an interesting future research question. In general, Latin America would benefit from the development of panel data.

Relatedly, there are relevant selection issues: perhaps it is more likely that unhappy people are attracted by bigger, anonymous places. Do the previously unhappy people get happier in such places, or do they drive down the average happiness of these places? Simmel, cited above, would suggest that the latter is more likely. Our descriptive statistics for education suggest potential selection issues too. The development of panel data for Latin America is necessary to answer these questions and many others regarding the well-being of people who live there. As well as employing representative panel data when it exists, future studies would employ more data regarding regional characteristics. Regardless of the size of place, life satisfaction relates to a not negligible extent to the availability and quality of healthcare services (Kotakorpi & Laamanen 2008), education opportunities (Dolan, Peasgood, and White 2008), and crime level (Cohen, 2008).[15] Moreover, climate, as well as environmental conditions, has been shown empirically to be of importance (Rehdanz and Maddison 2005; Brereton, Clinch, and Ferreira 2008). Frijters and van Praag (1998) showed, for example, that life satisfaction is correlated positively with the numbers of hours of sunshine. As discussed in Section 2, for example, both MacKerron and Mourato (2013) and Gidlöf-Gunnarsson and Öhrström (2007) demonstrated the importance of green areas and environmental conditions. Ambrey (2016)

[15] Another consideration is that those with higher education who stay or live in small places may be less likely to find suitable employment that matches their education. In other words, they might be overeducated which has been shown to reduce life satisfaction (Piper (2015b).

too finds that greenspace matters more for individual happiness in more populated regions. This is perhaps particularly so in Latin America, where a lot of cities are in the mountains, remote and difficult to reach. It could also be that some cities simply lie in a valley and the sunshine duration is lower than in other places too.

Many studies do look at specific regions, e.g. Mouratidis (2019) with Oslo, and Želinský et al. (2021) with Slovakia, who also call for more context-specific studies. Belikow et al. (2021) support this call, recommending more research to explore additional characteristics of the built environment to better understand its influence on subjective well-being; a good example of such research for Europe is Hart et al. (2018). Similarly, a study has compared the well-being of 148 mid-sized US cities based upon their transport possibilities (Talmage & Frederick 2019). They find that people in cities that allow for multimodality are happier than those which rely on automobiles. It is intriguing whether such a distinction applies in Latin America. Do the happier regions offer their citizens better transport facilities and links than those less happy? Recently, Zumelzu and Herrmann-Lunecke (2021) discuss mental well-being, walkable cities and green space and similarly call for more related research from Latin America. Similar questions and investigations are easy to conceive of and may well be fruitful for enhancing our understanding of place and well-being, in addition to the research regarding town size and well-being.

Future research for Latin America could assess the roles of different groups in society for the town size and well-being relationship, for example migrant happiness and migrant share. Dang et al. (2020) found that for an area of China, the relatively low well-being of migrants brought the average well-being down for very large cities. As in footnote 13 mentioned above, a similar conjecture was raised by Berry and Okulicz-Kozaryn (2011), and we also considered the inclusion of a dummy variable for migration status. However, the *Latinobarómetro* has very little information on migrant status so this study was unable to properly look at this, but future work with other datasets perhaps could. In the *Latinobarómetro* the question closest to eliciting information regarding migrant status is one asking whether the respondent is a citizen of the country they are interviewed in. Less than 2% of our sample is comprised of non-citizens and they do not appear to be different from citizens.[16] Other datasets may have more representation of migrants and thus be better able to assess the conjecture of Berry and Okulicz-Kozaryn (2011). Research about other groups may well be informative. For example, that of Rüger et al. (2023) who investigate the relationship between German Foreign Service expatriates and find that the most important factor for the 'geography of happiness' to be the quality of and access to nature.

Different groups have different needs and desires regarding where they live, but future research could also explore what towns and cities of different sizes might require from individuals to thrive as a happy place. One possibility would be to investigate the ideal age distribution of the population. Do, for example, large cities

[16] This does not feature in our main results because it is not included in the *Latinobarómetro* for all of the years of our sample; when we do include this information, accepting the loss of data involved, the few changes in the results stem from the fewer years of data rather than the inclusion of a citizen control.

need a relatively large number of young people to do the work and other tasks that large cities specifically require (e.g. courier work and jobs in retail)? In general, there are some arguments that suggest having a good age balance helps societies thrive with the old and the young are needed in roughly equal measure (Jamieson, 2022). Thus, future research might ask whether happier places more balanced in terms of age distribution, or is there important nuance based on town size. Has the age make up of places changed and has that change had an impact on well-being, aside from the standard age-well-being relationship (Lepinteur & Piper 2023). Similar arguments could be made for gender balance too. Given the arguments about the need for balance some developing countries, for different reasons, may suffer with a relative surfeit of youth compared to old or females compared to males: does this affect the functioning of society and well-being in such places?

Measures of well-being other than life satisfaction or happiness could be more widely considered by future research too, along with measures of ill-being. One large sample study considered the variability and predictors of life expectancy and mortality in 363 cities across nine Latin American countries with quite diverse results (Bilal et al., 2021). Other questions could enquire about the role of loneliness in differently sized places, particularly given the common view that anonymity and loneliness are more prevalent in big cities—at least in highly developed nations. Relatedly, given the primacy of social relationships as an explanation for the so-called Latin American Happiness paradox, i.e. the region being generally happier than expected given national income levels, more data on the quality of the individual's human relationships could also be taken into account in future work.

Concluding Remarks

Our results provide an advance on the previous research for Latin America, which generally found that residents of large cities in the region are relatively less satisfied with their lives. Assessed in the same way as previous research, we would (and do) find the same result: there is a negative association between town size and well-being for towns and cities with a population of at least 100,000. However, due to the creation and use of more refined town size categories in our study, enabled by the merging of information from various years of the United Nations Demographic Yearbook data, and thus not being solely reliant on the main dataset used for this information, our results also challenge this finding by offering previously unfound

nuance. We find that, instead of the inhabitants of big cities being particularly less satisfied, people in town sizes between 10,000 and 500,000 are, on average, less satisfied than those in the cities above and below. That prior research could not uncover this due to their practice of the capturing of any town or city with a population larger than 100,000 together in one group strongly emphasizes the need of any future research regarding town size, or urban-rural distinctions, and well-being to consider more refined categories than just those offered by datasets like the *Latinobarómetro*. This is an important finding and recommendation, both for Latin America and elsewhere. As discussed above, this problem afflicts work from other regions too.

Furthermore, our results indicate that, broadly, the less educated are less satisfied with their lives than those with more education and are more likely to cluster in relatively small locations. We find that individuals with at least medium levels of education are happier than those with low education in cities with populations of between one and five million people, a result in addition to the finding of the life satisfaction premium for education in Latin America.

In summary, our results show that individuals living in places with populations of more than 10,000 but less than 500,000 are less satisfied than those living in both less and more populous places. Additionally, our investigation of Morrison's (2018) idea of education being partially responsible for the urban paradox received qualified support with our results: the highly-educated have higher life satisfaction in cities with one and five million inhabitants, possibly reflecting a better ability and capacity of the highly-educated to make use of the amenities and opportunities of such large cities offer. Of the limitations and avenues for future research discussed above, particularly important are those that relate to the dataset, and other commonly used datasets. Making use of the town size data in these datasets alone leads to a too broad picture regarding town size and well-being. Our hope is that future work will follow us in using external data regarding population to better assess the relationship between well-being and town size; one of the ways we suggest which would increase collective understanding of this aspect of the 'geography of happiness'.

Appendix

Table A1 Descriptive statistics of all individual characteristics included in the analysis for the Latin American region and single countries from 2006 to 2015

Variable	All (n = 104,282)	Bolivia (n = 9,223)	Costa Rica (n = 7,617)	Paraguay (n = 9,430)	Ecuador (n = 9,381)	Peru (n = 9,252)	Colombia (n = 9,355)	El Salvador (n = 7,536)	Uruguay (n = 9,373)	Brazil (n = 9,271)	Chile (n = 9,043)	Nicaragua (n = 7,594)	Panama (n = 7,207)
Life satisfaction													
not at all satisfied	3.5%	4.2%	1.3%	3.5%	4.1%	5.1%	1.9%	6.5%	3.7%	2.5%	3.3%	4.3%	1.8%
not very satisfied	25.3%	39.7%	12.9%	23.5%	32.6%	41.8%	16.3%	27.7%	19.2%	19.1%	28.2%	24.0%	14.3%
fairly satisfied	44.8%	39.8%	41.3%	48.4%	42.7%	35.0%	38.1%	36.3%	55.9%	70.5%	51.1%	36.0%	36.8%
very satisfied	26.4%	16.3%	44.6%	24.6%	20.6%	18.1%	43.7%	29.6%	21.3%	7.9%	17.4%	35.7%	47.1%
Income categories													
sufficient income	9.3%	10.6%	13.7%	7.7%	6.6%	8.4%	7.8%	6.5%	7.1%	16.8%	6.9%	5.5%	15.0%
just sufficient income	41.9%	45.6%	48.6%	52.1%	37.6%	41.4%	35.1%	31.8%	50.4%	44.9%	45.2%	28.0%	38.4%
insufficient income	36.8%	36.2%	30.2%	32.6%	40.0%	37.5%	38.1%	43.5%	33.6%	29.7%	39.6%	46.5%	35.2%
very insufficient income	12.0%	7.6%	7.4%	7.6%	15.8%	12.8%	19.0%	18.2%	8.9%	8.6%	8.3%	20.0%	11.4%

Table A1 (continued)

Variable	All ($n=104,282$)	Bolivia ($n=9,223$)	Costa Rica ($n=7,617$)	Paraguay ($n=9,430$)	Ecuador ($n=9,381$)	Peru ($n=9,252$)	Colombia ($n=9,355$)	El Salvador ($n=7,536$)	Uruguay ($n=9,373$)	Brazil ($n=9,271$)	Chile ($n=9,043$)	Nicaragua ($n=7,594$)	Panama ($n=7,207$)
Socioeconomic level													
very good	7.3%	2.9%	12.4%	6.5%	4.1%	3.3%	13.0%	8.2%	5.8%	11.5%	3.9%	5.3%	11.7%
good	33.5%	22.2%	40.9%	35.5%	32.7%	22.9%	42.2%	28.7%	41.3%	43.8%	32.1%	23.8%	35.2%
not bad	43.4%	56.7%	37.8%	45.9%	45.7%	48.2%	33.0%	42.6%	42.2%	32.9%	49.4%	42.1%	42.7%
bad	13.4%	16.7%	7.8%	10.7%	14.4%	21.4%	9.4%	17.9%	9.2%	9.9%	13.7%	20.9%	9.1%
very bad	2.5%	1.5%	1.2%	1.5%	3.2%	4.2%	2.4%	2.6%	1.5%	1.9%	0.9%	8.0%	1.4%
Gender													
male	48.7%	50.3%	49.3%	50.0%	49.6%	50.2%	46.8%	47.7%	46.9%	48.0%	46.3%	49.0%	50.2%
female	51.3%	49.7%	50.7%	50.0%	50.4%	49.9%	53.3%	52.3%	53.1%	52.1%	53.7%	51.0%	49.8%
Marital status													
single	30.5%	27.1%	32.8%	32.3%	26.4%	29.9%	30.9%	34.7%	26.0%	31.9%	27.4%	36.7%	33.2%
partnered or married	57.9%	62.8%	54.9%	60.1%	62.3%	61.1%	57.6%	54.8%	53.3%	55.2%	58.2%	56.1%	56.3%
separated, divorced, widowed	11.6%	10.1%	12.3%	7.6%	11.4%	9.0%	11.5%	10.4%	20.7%	13.0%	14.4%	7.3%	10.5%
Educational level													
illiterate	8.0%	11.8%	5.9%	1.4%	8.0%	8.3%	3.9%	19.9%	1.0%	8.2%	2.1%	22.9%	7.4%
incomplete primary educ.	21.1%	31.4%	19.3%	30.6%	9.1%	12.1%	17.0%	34.3%	10.3%	35.9%	15.4%	25.5%	14.1%
primary educ.	15.7%	7.3%	29.6%	12.4%	29.0%	12.6%	12.9%	13.1%	23.2%	10.6%	7.3%	12.8%	19.1%
incomplete secondary educ.	16.1%	10.3%	16.3%	16.4%	11.7%	7.4%	17.8%	11.2%	35.1%	8.8%	16.2%	21.3%	21.2%
secondary educ.	21.8%	18.7%	12.0%	26.4%	20.3%	29.4%	31.6%	11.6%	15.0%	23.3%	37.4%	9.3%	20.2%
incomplete higher educ.	8.7%	10.7%	9.8%	8.0%	14.5%	11.8%	6.6%	5.3%	7.4%	6.2%	8.5%	4.4%	10.1%

Table A1 (continued)

Variable	All ($n=104,282$)	Bolivia ($n=9,223$)	Costa Rica ($n=7,617$)	Paraguay ($n=9,430$)	Ecuador ($n=9,381$)	Peru ($n=9,252$)	Colombia ($n=9,355$)	El Salvador ($n=7,536$)	Uruguay ($n=9,373$)	Brazil ($n=9,271$)	Chile ($n=9,043$)	Nicaragua ($n=7,594$)	Panama ($n=7,207$)
complete higher educ.	8.7%	9.8%	7.1%	4.8%	7.6%	18.4%	10.2%	4.7%	8.2%	7.0%	13.2%	3.8%	7.9%
Employment status													
employed	25.3%	17.7%	31.3%	25.1%	22.3%	18.4%	20.6%	20.4%	34.8%	27.0%	37.5%	19.3%	29.6%
self-employed	32.9%	46.0%	21.7%	38.8%	41.2%	42.1%	34.0%	37.0%	19.1%	36.5%	14.8%	36.5%	24.4%
unemployed	5.6%	3.7%	7.6%	5.1%	3.0%	3.5%	9.4%	6.1%	7.3%	6.0%	4.4%	5.7%	6.2%
retired	7.2%	2.9%	8.4%	3.6%	2.4%	3.7%	4.7%	3.5%	21.8%	12.2%	11.2%	2.3%	9.0%
not in labour market	22.7%	20.6%	25.5%	21.8%	24.4%	24.5%	25.4%	28.0%	13.4%	13.7%	23.5%	29.2%	26.2%
student	6.2%	9.1%	5.6%	5.7%	6.8%	7.8%	5.9%	4.9%	3.6%	4.7%	8.6%	7.2%	4.6%

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Table A2 Descriptive statistics of all regional characteristics included in the analysis for the Latin American region and single countries from 2006 to 2015

	All		Bolivia		Costa Rica		Paraguay		Ecuador		Peru		Colombia	
Variable	mean	sd	mean	sd	mean	sd	mean	sd	mean	sd	mean	sd	mean	sd
GDP p.c. at PPP in USD	12,923	5,594	6,708	647	16,894	1,233	10,165	972	10,618	791	9,968	1,337	12,037	1,116
pos. GDP change	3.6%	2.4%	3.3%	1.0%	3.4%	2.1%	4.1%	2.8%	2.4%	2.1%	5.3%	2.7%	3.5%	2.0%
neg. GDP change	0.2%	0.8%	0.0%	0.0%	0.3%	0.7%	0.2%	0.5%	0.3%	0.6%	0.0%	0.0%	0.0%	0.0%
Unemployment rate	6.0%	2.6%	2.6%	0.2%	7.2%	1.9%	4.8%	0.4%	3.7%	0.5%	3.6%	0.4%	10.6%	1.2%
Inflation rate	5.3%	3.2%	6.6%	3.7%	7.4%	3.8%	6.2%	3.0%	4.2%	1.8%	3.0%	1.3%	4.2%	1.6%

Table A2 (continued)

Variable	El Salvador mean	sd	Uruguay mean	sd	Brazil mean	sd	Chile mean	sd	Nicaragua mean	sd	Panama mean	sd
GDP p.c. at PPP in USD	7,482	329	18,792	2,443	14,443	911	21,550	1,637	4,814	386	22,056	3,486
pos. GDP change	2.0%	1.1%	4.7%	2.2%	3.0%	2.1%	3.2%	1.8%	2.9%	1.3%	5.9%	3.1%
neg. GDP change	0.3%	0.8%	0.0%	0.0%	0.6%	1.4%	0.3%	0.9%	0.6%	1.5%	0.1%	0.2%
Unemployment rate	5.4%	1.3%	7.9%	1.4%	7.9%	0.7%	8.4%	1.5%	6.1%	1.2%	3.2%	0.6%
Inflation rate	2.9%	2.4%	7.7%	0.8%	5.6%	1.5%	3.5%	2.4%	8.6%	4.9%	3.9%	2.4%

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Declarations

Conflict of Interest The authors certify that they have NO affiliations with or involvement in any organization or entity with any financial interest (such as honoraria; educational grants; participation in speakers' bureaus; membership, employment, consultancies, stock ownership, or other equity interest; and expert testimony or patent-licensing arrangements), or non-financial interest (such as personal or professional relationships, affiliations, knowledge or beliefs) in the subject matter or materials discussed in this manuscript.

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