

Happy Colombia, Unhappy Bogota

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Graphical Abstract:

Urban-Rural happiness gradient endpoints. Note that the gradient has multiple steps as illustrated with frownie and smiley emojis, but for simplicity only urban-rural end points illustrated with photos: Rural Salento (flickr.com/photos/pedrosz/9515685099), and Bogota Centro ([commons.wikimedia.org/wiki/File:\)](https://commons.wikimedia.org/wiki/File:)



We study urban-rural Subjective WellBeing (SWB) differences, aka urban-rural happiness gradient, in Colombia. Almost all research on urban-rural SWB differences are in global North—this is one of few studies in global South, and the first focusing on Colombia. Colombia, a developing country, is expected to have little or no urban-rural gradient that is observed in developed countries—cities promote economic growth needed in developing countries, and thus, may not be distinctively unhappy as in developed countries. While we find weak evidence of the urban-rural happiness gradient, we find strong evidence for the unhappiness in Bogota, the largest Colombian city of 8m. Bogota is about .4 (on 1-10 scale) less happy than rural Colombia.

HAPPINESS, LIFE SATISFACTION, SUBJECTIVE WELLBEING (SWB), CITIES, URBANICITY, URBAN-RURAL, URBAN-RURAL HAPPINESS GRADIENT, WORLD VALUES SURVEY (WVS)

"The more densely populated our cities become, the more our lives are characterized by feelings of isolation and loneliness."¹

Intro

Colombia is a fascinating place for happiness research—apparently unlivable but happy—it ranks as one of the happiest countries in the world despite having low to moderate economic development, much poverty and inequality (Okulicz-Kozaryn 2023). Another reason to study Colombia is that there are very few happiness studies focusing on it.

Most happiness studies are in global North, and the field is still only emerging in Latin America (Rojas 2015, 2019). Carol Graham was an early student of Latin happiness, yet her studies are in general about the continent, they do not focus on Colombia (Graham

¹<http://pubs.socialistreviewindex.org.uk/isj79/cox.htm>

2015, Graham and Felton 2006, Graham and Pettinato 2002, 2001). Krauss and Graham (2013) is an exception, but it focuses on labor market, not geography.

There are cross national studies focusing on urban-rural happiness that include Colombia (e.g., Okulicz-Kozaryn and Valente 2021, Valente and Berry 2016), but they do not focus on Colombia and gloss over. Extant literature does not address Colombian intricacies. There are happiness studies focusing on Colombia, say Hurtado (2016), Velásquez (2016) in “Handbook of Happiness Research in Latin America,” but they do not address the urban-rural happiness. Burger et al. (2021) is an exception, but it uses questionable Gallup data (see discussion in Okulicz-Kozaryn and Valente 2021), hence, we leave it out.

In poorer countries there is less of an urban penalty of urbanism (Okulicz-Kozaryn and Valente 2021), or even a premium, as in the poorest African countries (Glaeser 2011), then question is what is it in Colombia, still relatively poor, and very unequal. PCGDP (PPP, USD) varies across regions considerably, for instance, Bogota, Meta, and Santander are >20k, while Amazonas, Nariño, and Choco are <7k–threefold difference (see SOM for details). So perhaps livability or quality of life in the poorest areas is not enough to provide environment for high happiness?

On one hand, as in the developed countries (Okulicz-Kozaryn and Valente 2021), there may be happiness penalty for the very largest cities such as Bogota, and perhaps Medellin and Cali. On the other hand, we know that cities promote economic growth (O’Sullivan 2009, Glaeser 2011)—economic development first as per figure 1, then lifestyle, so maybe actually big cities are happier in Colombia?

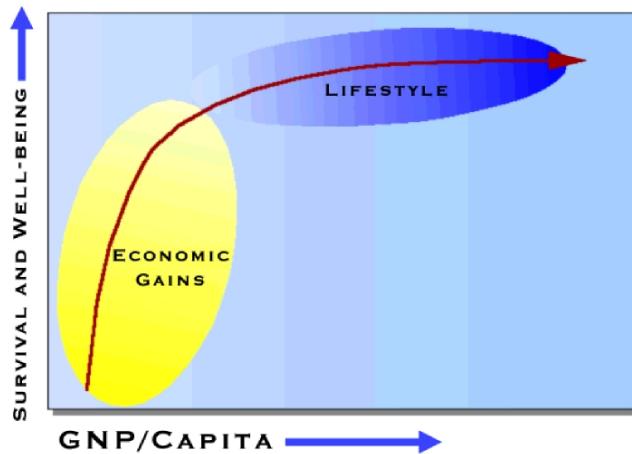


Figure 1: Well-being and income, (Inglehart 1997).

The theory is either ambivalent or predicts urban wellbeing penalty (White and White 1977). Classic urban sociological theory clearly predicted urban malaise (Wirth 1938, Simmel 1903, Tönnies [1887] 2002, Park et al. [1925] 1984), but Fischer later noted some positives, i.e. social communities within cities (Fischer 1995, 1982, 1981, 1975, 1973, 1972).

Likewise, homophily (love of the same) theory (McPherson et al. 2001, Tajfel 1982, Tajfel et al. 1971, Smelser and Alexander 1999, Putnam 2007, Fowler and Christakis 2008) predicts wellbeing penalty in heterogeneous and diverse settings such as cities (Herbst and Lucio 2014, Postmes and Branscombe 2002, Okulicz-Kozaryn 2015). Only economists tend to argue one-sidedly in favor of cities—there is more production and consumption in cities, so there is more utility, so the thinking goes, there must be more happiness as well (Glaeser 2011, O’Sullivan 2009).

And fundamentally urbanism is incompatible with human nature—*homo sapiens* evolved without cities (Maryanski and Turner 1992). Humans crowded in a city is like ants in an anthill or bees in a hive—but humans are unlike ants or bees—by one estimate humans are 90% chimp and only 10% bee (Haidt 2012). Only industrial revolution, merely 200-250 years or about 7-10 generations ago started urbanism—the main reason we have cities is that putting a lot of people at high density facilitates production, but a reasonable and

convincing argument is made that now we actually need less production, not more (Hickel 2020, Kallis et al. 2012, Kallis 2011).

It is usually forgotten that a city is a very recent human invention in our species history. Using a cutoff of 100k to denote a settlement that is a city, in 1950, a mere 13% lived in cities, only about 3 generations ago, rural was a norm. And in 1800, before industrialization took off, a minuscule 1.7% lived in cities—urban way of life was pretty much unheard of just several generations ago (Davis 1955).²

Likewise, in Colombia, while Cali and Bogota were founded in mid 1500s and Medellin in early 1600s—the three greatest Colombian multimillion metropolises of today were just small towns few generations ago. Bogota was only 30k in 1851 and 117k in 1912 (Sowell 2012), Medellin was 60k in 1905³, and Cali was 88k in 1938 (Dávila 2001). In early 1900s, time of our grandparents youth, there was no large city ($> 500k$) in Colombia—urbanism is a new development.

Urbanism in Colombia

Colombia is a large country at about 52m, third largest Latin country (after Brazil and Mexico) and urbanized as much as the US at about 80 percent. Colombia's urbanization trajectory follows overall Latin American one, except that it started more rural in 1950 at about 33% (LA at 40%), by 1975 both at 60%, in 2000 about 75%, and projected about 90% by 2050 (population.un.org/wup/Country-Profiles). Yet the United Nations/World Bank definition has urban-rural cutoff very low. Looking at medium and large cities $> .5m$ v elsewhere, only about 25m out of about 50m Colombian population live there, about half.

It is crucial to treat urbanicity or urbanness as a gradient/degree, not binary/dichotomy. Metropolis of 5m is very different from city of 500k, and town of 50k is still very different again. The built environment varies dramatically: from sprawling hundreds of square kilometers with towers, subway, and large airport in a metropolis to walkable from-end-to-end several square kilometers mostly two or three stories. Way of life varies dramatically, too: from hectic, impersonal, and anonymous in a metropolis to slow paced, personal, and knowing people on the streets town.

Ten largest cities are listed in table 1—what's clear is that Bogota is a category of its own, while similar in density to other large cities,⁴ it is about 3x larger than 2nd and 3rd Medellin and Cali, which would be another category about 2x larger than 4th Barranquilla. We will focus here on 3 categories of cities: 1) Bogota; 2) Cali and Medellin; 3) other cities larger than about .5m as listed in table 1. The authors visited personally all three largest cities, Bogota feels North-Western not only in climate but also in attitude and behavior, stressful. Bogota doesn't feel like Colombia, it feels like a Western city, say Philadelphia or London, rushed, stressed, and alienated. Cali is the most Latin of the three cities, and Medellin seems to merge reasonably well economic development and organization but yet does not appear stiff and stressed like Bogota. Smaller places such as Popayan, Pasto appear warmer and more welcoming and happier than Bogota.

²Using UN definition of urban, only about 3 generations ago in 1950, 70% of humans led a rural way of life—rural was a norm, but in another generation, in 2050, the proportions will have flipped, and 70% of the world will be urban (population.un.org/wup). Urban-rural dichotomy is not only crude, but the UN definition also varies across countries—it follows national statistical offices definitions—which are usually quite low, for India, for instance, the cutoff is only 5k people. Indian census of 2011 defines urban as a place having population $> 5k$, > 400 persons per square kilometer, and $> 75\%$ of males working population in non-agricultural sectors (Deb and Okulicz-Kozaryn 2023). A place of several thousand people is not really a city.

³https://www.medellin.gov.co/movilidad/documents/resumen_plan_movilidad_segura_medellin_2014_2020.pdf.

⁴Density often adds valuable information because population size is also a function of arbitrary administrative boundaries. Density comparable to that of Berlin at 4k and about a quarter of that of Seoul or Barcelona at 16k—same source as in table 1: <https://unstats.un.org/unsd/demographic-social/products/dyb/dybsets/2021.pdf>. But note that using night time satellite imaginary densities of Bogota, Cali, and Medellin are quite high at 20k, severalfold higher than Quito at 6.5k or Lima at 11k (Parés-Ramos et al. 2013). Barranquilla is shown as denser than Bogota but that's because administrative boundaries in Barranquilla are about 3/4 built up environment, whereas in Bogota it appears to be only about half (assuming that city boundaries on google maps are accurate): Barranquilla v Bogota. Also note an useful distinction can be made to distinguish between core and satellites—see table 1 in Duranton (2015). UN Habitat World Cities Report 2022 scores cities in terms of housing, sanitation etc at https://unhabitat.org/sites/default/files/2022/06/wcr_2022.pdf. Another way to measure density is to use built-up area per cap—see last column in table 1.

Table 1: 10 largest Colombian Cities .5m-8m (note: there are several more cities of about .5m that are not listed). Data source: population, density: latest available year, 2002-2021 <https://unstats.un.org/unsd/demographic-social/products/dyb/dybsets/2021.pdf>; built-up area per cap: 2015 <https://data.unhabitat.org/datasets/GUO-UN-Habitat::11-3-1-land-consumption-rates-in-colombia/about>

rank	city	population (millions)	density (thousands per sq km)	built-up area per cap (sq m)
1	Bogota	7.8	4.8	40
2	Medellin	2.6	6.6	39
3	Cali	2.3	4.1	45
4	Barranquilla	1.3	7.8	60
5	Cartagena	1	1.8	45
6	Cucuta	.8	1	76
7	Soacha	.8	4.2	38
8	Soledad	.7	1	34
9	Bucaramanga	.6	4	51
10	Ibagué	.5	.4	55

Data and methods

We use World Values Survey (WVS) freely available from worldvaluessurvey.org, which is better suited for the study of urbanicity than Gallup data (Okulicz-Kozaryn and Valente 2021). The variables are listed in table 2 Additional descriptive statistics are in SOM (Supplementary Online Material). SWB question reads "All things considered, how satisfied are you with your life as a whole these days? Using this card on which 1 means you are "completely dissatisfied" and 10 means you are "completely satisfied" where would you put your satisfaction with your life as a whole?"

Urbanicity is operationalized with WVS variable X049—note that it is objective and recorded by reviewer, not respondent. There are eight categories ranging from '< 2k' to '> 500k.' Again, urbanicity or urbanness is a gradient, not a binary urban v rural. For simplicity and due to small cell sizes we conduct the analysis using a set of 4 dummy variables: < 10k, 10 – 50k, 50 – 500k, > 500k. The < 10k category proxies free of city natural environment most closely resembling human natural habitat where humans have evolved, and it includes: wilderness, open country, and small villages. The other critical category that must be measured based on earlier review of theory is large cities, again, there is likely to be a threshold at several hundred thousand, hence we use the top category on WVS variable X049 '>500k' to proxy large cities. Such places, are the least resembling of human natural habitat and are mostly consisting of man made objects such as asphalt, concrete, glass, etc, and as per theory as reviewed earlier, are likely to be least happy (at least in developed countries). The remaining two categories are places-in-between: 10 – 50k and 50 – 500k.

Table 2: Variable definitions.

name	description
age	age
age2	age squared
male	male
married or living together as married	"Are you currently(READ OUT AND CODE ONE ONLY) 1 'Married' 2 'Living together as married' 3 'Divorced' 4 'Separated' 5 'Widowed' 6 'Single/Never married' 7 'Divorced, Separated or Widow' 8 'Living apart but steady relation (married,cohabitation)'"
divorced/separated/widowed	"Are you currently(READ OUT AND CODE ONE ONLY) 1 'Married' 2 'Living together as married' 3 'Divorced' 4 'Separated' 5 'Widowed' 6 'Single/Never married' 7 'Divorced, Separated or Widow' 8 'Living apart but steady relation (married,cohabitation)'"
health	"State of health (subjective)"
class	"Social class (subjective)"
education	"Highest educational level attained"
income	"Scale of incomes"
Employment status	"Are you employed now or not? IF YES: About how many hours a week? If more than one job: only for the main job 1 'Full time' 2 'Part time' 3 'Self employed' 4 'Retired' 5 'Housewife' 6 'Students' 7 'Unemployed' 8 'Other'"
religious services	"Apart from weddings, funerals and christenings, about how often do you attend religious services these days?"
Religious denomination	"Religious denomination WVS: Do you belong to a religious denomination? In case you do, answer which one. EVS: Which one?"
victim of a crime last year	"Have you been the victim of a crime during the past year?"
freq felt unsafe from crime at home	"In the last 12 months, how often have you or your family: Felt unsafe from crime in your own home "

We use a usual set of control variables following Okulicz-Kozaryn and Valente (2021). There are several controls worth discussing. Crime is a key urban attribute—doubling size of a place increases crime by 15% Bettencourt and West (2010), Bettencourt et al. (2007) We use 2 measures to capture crime: “victim of a crime last year” and “freq felt unsafe from crime at home.” Income, class, and education are important controls—not only predict greater SWB, but are also confounded and higher in cities (e.g., Carlsen and Leknes 2019).

We use a standard OLS regression with robust standard errors. We treat the 10-step happiness variable as continuous. Ordinal happiness can be treated as a continuous variable (Ferrer-i-Carbonell and Frijters 2004). OLS has become the default method in happiness research (Blanchflower and Oswald 2011). Theoretically, while there is still debate about the cardinality of SWB, there are strong arguments to treat it as a cardinal variable (Ng 1996, 1997).

Results

Results are set in in table 3. In bivariate model a1, there is no difference across urbanicity—an expected result—the gradient only arises controlling for socio-demographics, e.g., income, education, and social class are confounded with urbanicity (Okulicz-Kozaryn and Valente 2021). Not controlling for SWB predictors (and/or using Gallup data) may even lead one to an erroneous conclusion that people are happier in cities⁵

Addition of basic sociodemographics in a2 is not enough to produce a gradient. Addition of health, class, and education in a3 increases negative effect of cities, but results still remain insignificant. Only addition of income in a4 is enough to produce significant results. Model a5 oversaturated with extra controls does not change the results much.

Model a5a adds crime, a key urban problem—while the magnitude changes only slightly, it becomes statistically insignificant and the sample size is reduced by almost half (due to missing data on crime variables). The statistical insignificance is due to negative impact of crime, not due to the sample size—model a5b drops crime controls, reruns model a5, except on sample from a5b and coefficient on “500k-” is significantly negative again.

	a1	a2	a3	a4	a5	a5A	a5b
urbanicity (base: lt 10k):							
10-50k	-0.04	-0.02	-0.04	-0.07	-0.08	-0.18	-0.18
50-500k	-0.03	-0.01	-0.10	-0.15	-0.14	-0.11	-0.17
500k+	-0.05	-0.02	-0.18	-0.25+	-0.23+	-0.20	-0.31*
age	0.00	0.01	0.01	0.01	0.01	0.03+	0.03
age2	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
male	0.01	-0.10*	-0.11*	-0.05	-0.13	-0.12	
married or living together as married	0.21***	0.22***	0.22***	0.19**	0.16+	0.17+	
divorced/separated/widowed	-0.02	-0.00	-0.01	-0.03	-0.11	-0.12	
health		0.61***	0.59***	0.58***	0.59***	0.62***	
class		0.12***	0.07*	0.06*	0.05	0.06	
education		-0.03**	-0.06***	-0.06***	-0.06**	-0.06**	
income		0.08***	0.07***	0.09***	0.09***	0.10***	
religious services				0.02	0.01	0.01	
victim of a crime last year					-0.21*		
freq felt unsafe from crime at home					-0.17***		
constant	8.46***	8.25***	5.49***	5.53***	5.46***	5.40***	4.97***
year dummies	yes	yes	yes	yes	yes	yes	yes
employment status dummies	no	no	no	no	yes	yes	yes
N	6025	6024	5895	5874	5853	2885	2885
+ 0.10 * 0.05 ** 0.01 *** 0.001; robust std err							

Table 3: OLS regressions of life satisfaction.

Results for Specific Cities

A key limitation of the analysis so far is that it lumps in top category “> 500k” places of very different urbanness such as .5m Cucuta and 8m Bogota. Using region/province variable “X048WVS” and 500,000 top bin population cutoff we were able to identify Colombian

⁵For a recent example see <https://news.gallup.com/opinion/gallup/315857/degree-urbanisation-effect-happiness.aspx> and for a whole erroneous book see Glaeser (2011). Only in the poorest countries, where income is badly needed for necessities, cities may help satisfy human needs.

largest cities in WVS data as they uniquely fall in different provinces. Barranquilla and Soledad are exception as they both are Atlantico province, but they border each other and we simply treat them as one large city coded as Barranquilla. Then we simply replace the top “> 500k” category in WVS data with a dummy for each of the largest cities.

Regression results are set in in table 4: notably Bogota, but also Cali are less happy than smallest places; but not Medellin, the second largest city—actually Medellin and Cartagena have very small positive coefficients (but insignificant). We refrain from interpreting coefficients on “Cucuta,” “Bucaramanga,” “Ibagué” as there are only 24 observations for each of them. Note that Ibagué and Bucaramanga have large negative coefficients about as large as Cali, even close to Bogota, depending on specification, but insignificant—one reason being that there are few observations for these cities.

In table 4, as opposed to 3, even in model 1, without controls, there is already a significant difference for Bogota—it is less happy than the smallest areas even without controlling for predictors of happiness.

	b1	b2	b3	b4	b5	b5A	b5b
urbanicity (base: lt 10k):							
10-50k	-0.06	-0.04	-0.11	-0.17	-0.18	-0.18	-0.18
50-500k	-0.02	-0.00	-0.11	-0.17	-0.17	-0.12	-0.17
Medellin	0.27	0.30	0.09	-0.00	-0.03	0.03	-0.03
Barranquilla	0.02	0.03	-0.17	0.27	0.25	0.11	0.24
Cali	-0.10	-0.07	-0.30	-0.37+	-0.37+	-0.23	-0.36+
Bogota	-0.30+	-0.27+	-0.43**	-0.51**	-0.48**	-0.36*	-0.47**
Cartagena	0.21	0.20	0.13	0.09	0.13	0.21	0.13
Cucuta	0.14	0.14	0.14	-0.01	-0.04	0.03	0.02
Bucaramanga	0.06	0.10	-0.20	-0.31	-0.37	-0.31	-0.39
Ibagué	0.10	0.08	-0.22	-0.29	-0.34	-0.30	-0.33
age	-0.00	0.01	0.02	0.03	0.03+	0.03	
age2	0.00	-0.00	-0.00	-0.00	-0.00	-0.00	
male	-0.04	-0.16*	-0.17*	-0.13	-0.14+	-0.13	
married or living together as married	0.17+	0.18+	0.19*	0.17+	0.16+	0.17+	
divorced/separated/widowed	-0.05	-0.09	-0.10	-0.11	-0.10	-0.11	
health		0.67***	0.64***	0.62***	0.59***	0.62***	
class		0.14***	0.06	0.06	0.05	0.06	
education		-0.04*	-0.05**	-0.06**	-0.05**	-0.06**	
income			0.10***	0.10***	0.09***	0.10***	
religious services				0.01	0.01	0.01	
victim of a crime last year					-0.19+		
freq felt unsafe from crime at home					-0.16***		
constant	8.44***	8.41***	5.33***	5.06***	5.02***	5.41***	5.00***
year dummies	yes	yes	yes	yes	yes	yes	yes
religious denomination dummies	no	no	no	no	yes	yes	yes
employment status dummies	no	no	no	no	yes	yes	yes
N	3032	3032	2933	2917	2909	2885	2885

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

Table 4: OLS regressions of life satisfaction.

Discussion and Conclusion

We find a substantial negative effect size, of about .4 for Bogota. The evidence for the gradient, however, is less strong. This is consistent with previous research showing that while in general there is a happiness gradient rising from low happiness in large cities to high happiness in rural areas, the largest happiness difference is between the largest cities v small towns/villages/wilderness, i.e., cities bigger than several hundred thousand experience the largest happiness penalty (Okulicz-Kozaryn 2016).

Colombia is still being haunted by violence and conflict, much of which is rural (hrw.org/world-report/2020/country-chapters/colombia), and so in that respect it is notable that rural is happier than urban. Especially that we use data for 1998, 2012, 2018—when there was even more rural conflict and violence than now, especially before 2015.

Again, city usefulness is mostly economic—having many people packed densely aids in production (O’Sullivan 2009). We have used the happiness yardstick to weigh positives and negatives—in case of Bogota, negatives outweigh positives.

One mechanism for urban unhappiness is comparisons (Michalos 1985). Big city gives exposure to more comparisons, and as people tend to make upward comparisons (Frey and Stutzer 2002, Frey et al. 2008), it may result in relative deprivation and lower happiness, just as neighbors act as negatives (Luttmer 2005). Incidentally, there is a similar hint from another area in Colombia: inhabitants of

poor municipalities in the Choco are happy to know only that environment in which they were born and raised, but when they know and live in other municipalities with greater socio-economic development their demands and expectations increase (Muñoz-Cardona 2018). In other words, ignorance may be a bliss.

Future research can use Colombian data to explore further, e.g., Como Vamos data (as described in Martínez et al. 2015), and government data: Departamento Nacional de Planeacion (DNP) and Departamento Administrativo Nacional de Estadistica (DANE).

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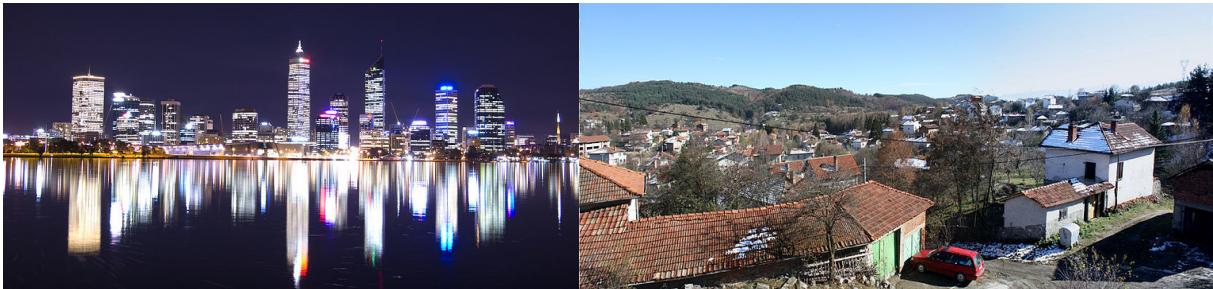
ONLINE APPENDIX

Metropolitan v Small-Town Visualization

For Colombian context, the metropolis could be Bogota or Medellin, and the small town could be Ipiales or Honda.

Figure 2: Imagine a person from a city, say, Chicago or London, meets a person from a town, say, Beeville TX or Vineland, NJ. Some likely face expressions (exaggerated; people hide emotions) of a city dweller are on the left, and of person from a town are on the right.

- (a) city: snazzy, awesome, cool, amazing, sexy, fantastic, spiffy, hot, great, pretty, sharp, stylish, jazzy, nifty, hip, (b) town: boring, ugly, ordinary, dull, average, normal, lame, plain, bland, stupid, common, dumb, unattractive

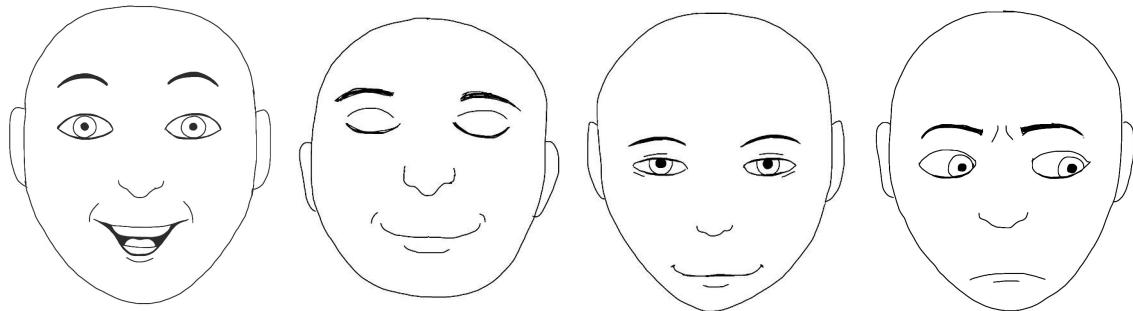


(c) ecstatic

(d) adored

(e) adoring

(f) embarrassed



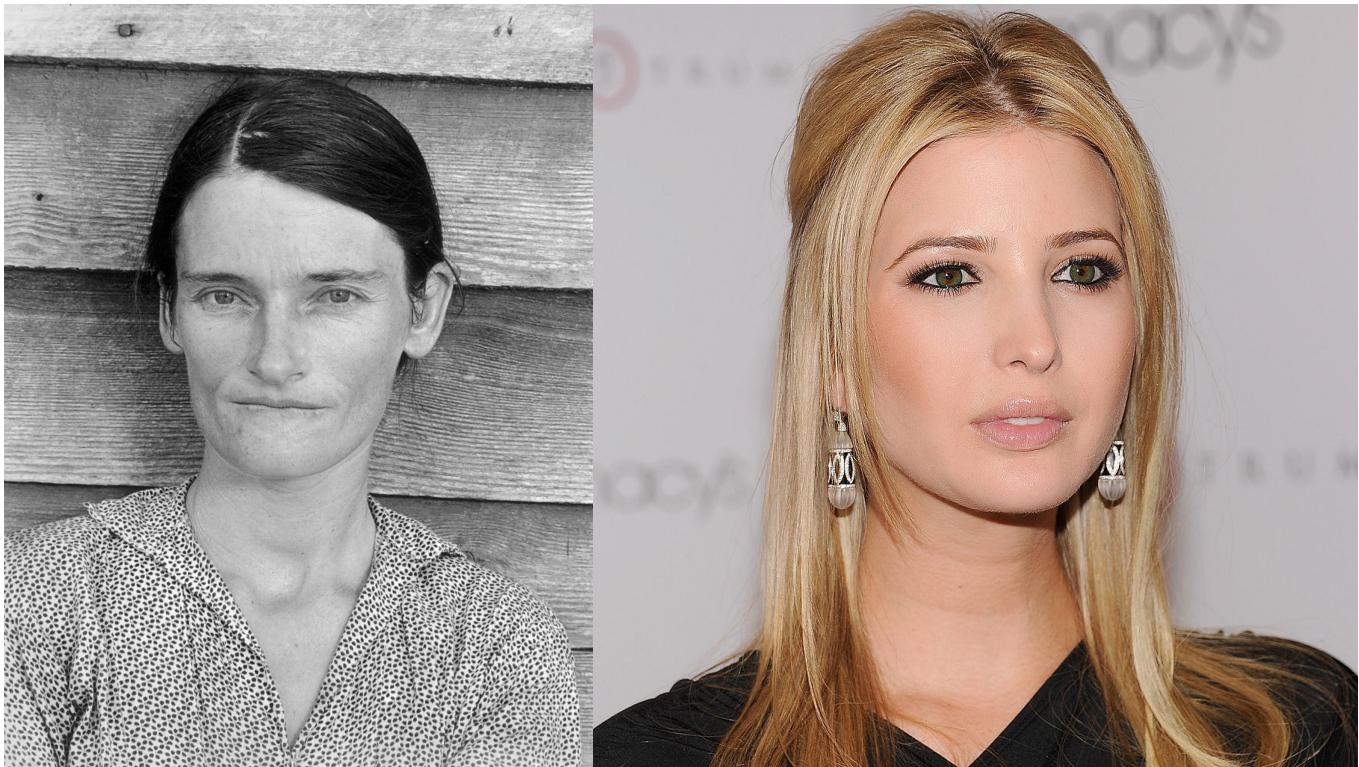
Author's Personal Observation on Bogota

I never look forward to visiting Bogota, it's a necessity as per central place theory, airport rare goods such as cigars etc. And it's not just build environment, asphalt, concrete, glass, ie city, that's depressing, it's people too, urnaosm is a way of life wirth. Otherwise relaxed positive forendly colboans are now acting closer to to stressed, cold, and unfriendly Philadelphians (replace with any other big city)

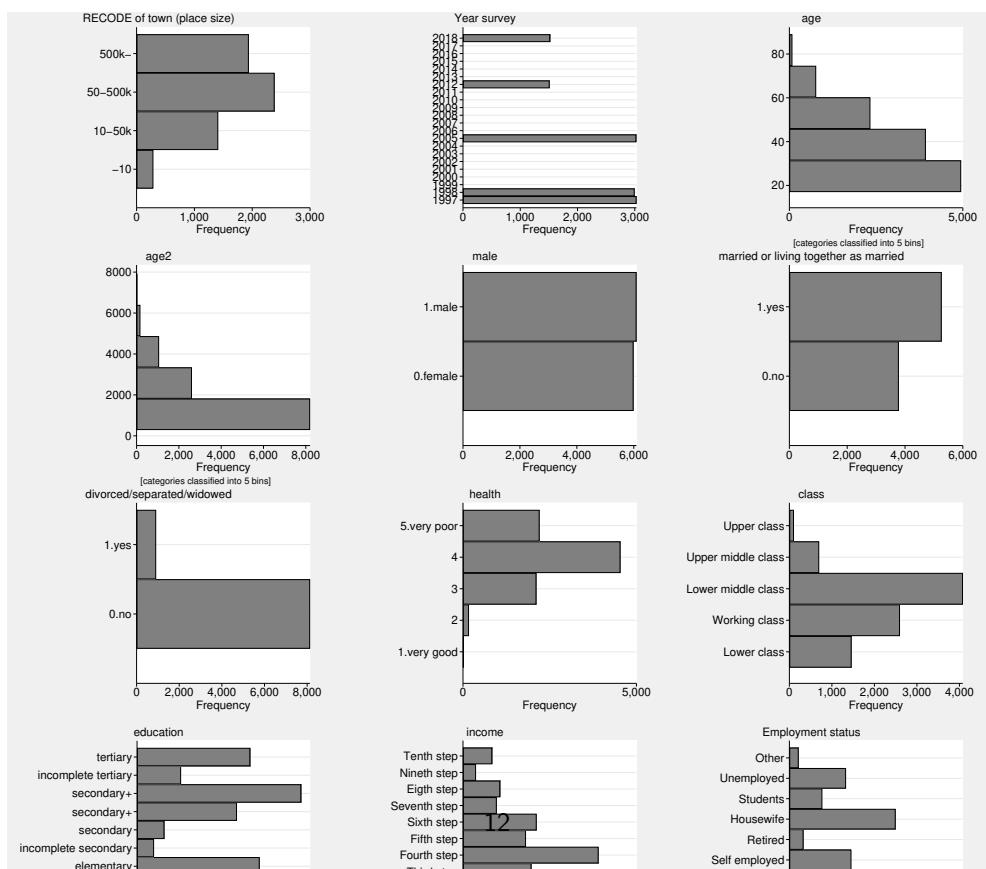
Figure 3: Rural v Urban way of life.

(a) "Becky, a rural woman." Allie Mae Burroughs from rural Hale County, Alabama from https://en.wikipedia.org/wiki/Farm_Security_Administration#/media/File:Allie_Mae_Burroughs_print.jpg. Public Domain.

(b) "Charlotte, an urban woman." Ivanka Trump from New York City from https://commons.wikimedia.org/wiki/File:Ivanka_Trump_in_2011.jpg. Creative Commons Attribution-Share Alike 2.0 Generic license.



Variables' definitions, coding, and distributions



Note that the main education variable has a sizable portion of it missing, and we have filled in the missing values based on the country-specific education variable X025A2, in a following way

```
replace ed=0 if X025A2==0 & ed==.
replace ed=2 if X025A2==1 & ed==.
replace ed=4 if X025A2==2 & ed==.
replace ed=5 if X025A2==3 & ed==.
replace ed=6 if X025A2==4 & ed==.
replace ed=7 if X025A2==5 & ed==.
replace ed=8 if X025A2==6|X025A2==7|X025A2==8 & ed==.
```

The largest Colombian cities were identified in a following way, and the frequencies on them are the following:

```
replace townN=4 if town4==4 & X048WVS==170102
replace townN=5 if town4==4 & X048WVS==170104
replace townN=6 if town4==4 & X048WVS==170129
replace townN=7 if town4==4 & X048WVS==170134
replace townN=8 if town4==4 & X048WVS==170135
//3 more 24 people ONLY:
replace townN=9 if town4==4 & X048WVS==170121
replace townN=10 if town4==4 & X048WVS==170126
replace townN=11 if town4==4 & X048WVS==170128
```

```
cap label drop townN_lbl
label define townN_lbl 1 "-10" 2 "10-50k" 3 "50-500k" 4 "Medellin" 5 "Barranquilla" 6 "Cali" 7 "Bogota" 8 "Cartagena" 9 "Cucuta" 10 "Bucaramanga"
```

tabulation:	Freq.	Numeric	Label
	289	1	-10
	1,411	2	10-50k
	2,386	3	50-500k
	176	4	Medellin
	78	5	Barranquilla
	152	6	Cali
	536	7	Bogota
	56	8	Cartagena
	24	9	Cucuta
	24	10	Bucaramanga
	24	11	Ibagué

Additional Descriptive Statistics

Regional explorations

Table 5: Listing of key variables of interest."

"province"	"SWB"	"GDP per cap, PPP, USD"	"Density per sq km"	""	""	""	""
Antioquia	8.691489	14656	100.72				
Atlantico	8.24375	11614	748.38				
Bogota	8.044776	22189	4670.8				
Bolivar	8.330358	13548	79.69				
Boyaca	8.3125	15619	52.5				
Caldas	8.5625	10479	126.55				
Caqueta	8	6855	4.52				
Cauca	7.8625	8750	49.97				
Cesar	8.525	11676	52.42				
Choco	8.1875	5837	11.49				
Cordoba	8.333333	6991	71.33				
Cundinamarca	8.090278	13412	120.57				
Huila	7.975	10548	55.32				
La Guajira	7.625	6645	42.24				
Magdalena	8.222222	6997	57.86				
Meta	8.475	23385	12.14				
Narino	7.95	6286	49.01				
Norte de Santander	8.65	8560	68.87				
Putumayo	8.075	7221	13.99				
Quindio	8.7	9534	292.63				
Risaralda	8.339286	10889	227.87				

Continued on next page

Table 5 – continued from previous page

"province"	"SWB"	"GDP per cap, PPP, USD"	"Density per sq km"	""	""	""	""
San Andres	9.0625		1178.46				
Santander	8.565789	25661	71.55				
Sucre	8.325	6560	82.89				
Tolima	8.479167	10636	56.45				
Valle del Cauca	8.163195	14346	202.16				
Amazonas		6298	.7				
Arauca		13685	11.01				
Casanare		26546	9.42				
Guainia		5383	.67				
Guaviare		5438	1.55				
Vaupes		4293	.75				
Vichada		4940	1.08				

abs and conclusion: preliminary evidence especially regarding regional differences—small sample, need more evidence using more data as data becomes available in the future

X048WVS	N	mean
CO: Atlantica	1383.0	8.4
CO: Centro Orien	1759.0	8.3
CO: Central	722.0	8.6
CO: Pacifica	663.0	8.2
CO: Bogota	688.0	8.2
CO: Orinoquia	170.0	8.5
CO: Amazonia	142.0	8.1
CO: Occidente	486.0	8.6
Total	6013.0	8.4

Linear regression	Number of obs	=	5,754
	F(15, 5738)	=	20.41
	Prob > F	=	0.0000
	R-squared	=	0.0597
	Root MSE	=	1.7561

ls	Robust	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
X048WVS						
CO: Centro Oriental	-0.08	0.07	-1.22	0.22	-0.21	0.05
CO: Central	0.12	0.08	1.47	0.14	-0.04	0.28
CO: Pacifica	-0.23	0.09	-2.62	0.01	-0.41	-0.06
CO: Bogota	-0.24	0.08	-2.87	0.00	-0.40	-0.08
CO: Orinoquia	0.20	0.15	1.36	0.17	-0.09	0.48
CO: Amazonia	-0.13	0.20	-0.68	0.50	-0.52	0.25
CO: Occidente	0.21	0.11	2.02	0.04	0.01	0.42
yr						
2005	-0.08	0.06	-1.33	0.18	-0.20	0.04
age	0.00	0.01	0.38	0.70	-0.02	0.03
age2	0.00	0.00	0.04	0.97	-0.00	0.00
male	-0.08	0.05	-1.65	0.10	-0.17	0.01
mar	0.29	0.06	4.66	0.00	0.17	0.41
div	-0.09	0.11	-0.84	0.40	-0.30	0.12
health	0.52	0.04	14.11	0.00	0.44	0.59
inc	0.03	0.01	2.98	0.00	0.01	0.05
cons	5.99	0.26	22.67	0.00	5.47	6.51

the simple mean differences are only .5 min for amazonia 8.1 and max for central 8.6 and occidente; contrillong fow swb predictors pacifica and bogota significantly less happy at about .24, and occidente happoer by .21 than base Atlantica, hence similarly, differences about .5

X048WVS	N	mean
CO: ANT-Antioqui	376.0	8.7
CO: ATL-Atlantic	160.0	8.2
CO: CAQ-Caquetá	40.0	8.0

CO: CAU-Cauca	80.0	7.9
CO: CES-Cesar	40.0	8.5
CO: CHO-Choco	16.0	8.2
CO: COR-Cordoba	96.0	8.3
CO: HUI-Huila	80.0	8.0
CO: LAG-La Guajira	32.0	7.6
CO: MET-Meta	80.0	8.5
CO: NAR-Narino	120.0	8.0
CO: NSA-Norte de ..	120.0	8.7
CO: PUT-Putumayo	40.0	8.1
CO: QUI-Quindío	40.0	8.7
CO: RIS-Risaralda	56.0	8.3
CO: SAP-San Andrés	16.0	9.1
CO: SAN-Santander	152.0	8.6
CO: SUC-Sucre	80.0	8.3
CO: TOL-Tolima	96.0	8.5
CO: VAC-Valle del Cauca	288.0	8.2
CO: CUN-Cundinamarca	144.0	8.1
CO: DC -Bogota (D.C.)	536.0	8.0
CO: BOL-Bolívar	112.0	8.3
CO: BOY-Boyacá	80.0	8.3
CO: CAL-Caldas	80.0	8.6
CO: MAG-Magdalena	72.0	8.2
Total	3032.0	8.3

Linear regression

Number of obs	=	3,014
F(33, 2980)	=	7.80
Prob > F	=	0.0000
R-squared	=	0.0879
Root MSE	=	1.906

	ls	Robust				
		Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
X048WVS						
CO: ATL-Atlántico		-0.45	0.18	-2.45	0.01	-0.81
CO: CAQ-Caquetá		-0.68	0.36	-1.88	0.06	-1.39
CO: CAU-Cauca		-0.59	0.30	-1.97	0.05	-1.18
CO: CES-Cesar		0.02	0.33	0.05	0.96	-0.63
CO: CHO-Choco		-0.02	0.73	-0.03	0.98	-1.45
CO: COR-Cordoba		-0.31	0.23	-1.34	0.18	-0.76
CO: HUI-Huila		-0.70	0.23	-3.06	0.00	-1.15
CO: LAG-La Guajira		-0.69	0.41	-1.67	0.09	-1.49
CO: MET-Meta		-0.09	0.25	-0.35	0.72	-0.58
CO: NAR-Narino		-0.58	0.21	-2.80	0.01	-0.99
CO: NSA-Norte de ..		0.01	0.17	0.06	0.95	-0.32
CO: PUT-Putumayo		-0.40	0.26	-1.53	0.13	-0.91
CO: QUI-Quindío		0.06	0.26	0.22	0.83	-0.45
CO: RIS-Risaralda		-0.33	0.25	-1.32	0.19	-0.81
CO: SAP-San Andrés		0.42	0.32	1.33	0.19	-0.20
CO: SAN-Santander		-0.20	0.16	-1.31	0.19	-0.51
CO: SUC-Sucre		-0.29	0.25	-1.16	0.25	-0.77
CO: TOL-Tolima		-0.18	0.21	-0.85	0.40	-0.58
CO: VAC-Valle del Cauca		-0.52	0.14	-3.73	0.00	-0.80
CO: CUN-Cundinamarca		-0.47	0.18	-2.58	0.01	-0.82
CO: DC -Bogotá (D.C.)		-0.66	0.12	-5.54	0.00	-0.90
CO: BOL-Bolívar		-0.19	0.20	-0.95	0.34	-0.58
CO: BOY-Boyacá		-0.24	0.24	-0.99	0.32	-0.72
CO: CAL-Caldas		-0.11	0.22	-0.52	0.60	-0.55
CO: MAG-Magdalena		-0.31	0.27	-1.12	0.26	-0.84
yr						
2018		-0.09	0.07	-1.29	0.20	-0.23
age		0.01	0.02	0.75	0.45	-0.02
age2		-0.00	0.00	-0.15	0.88	-0.00
male		-0.16	0.07	-2.26	0.02	-0.30
mar		0.19	0.09	2.08	0.04	0.01
div		-0.10	0.14	-0.73	0.47	-0.37
health		0.60	0.05	10.92	0.00	0.49
inc		0.09	0.02	5.67	0.00	0.06
cons		5.46	0.39	13.85	0.00	4.69
						6.23

here for last 2 waves 2012 and 2018, more detailed provinces, and larger differences, from 7.6 in La Guajira (only 32 obs) and 7.9 in Cauca to 8.6 in Santander, Caldas and 8.7 in Antioquia, Norte de Santander, and Quindío.

hence the difference between lo and hi is as large as about 1.

after controlling for basic predictors of happiness, relative to base case Antioquia, a number of provinces are less happy, Atlántico at .45, Caquetá at .7, Cauca at .6, Huila and La Guajira at .7, Narino at .6, Valle del Cauca at .5, Cundinamarca at .47, and Bogota (Distrito Capital) at .66. Notably Bogota is the very largest Colombian city, and also one of the least happy provinces. and that data from

govt has happiness but not sure how precise is urbanicity: Encuesta Nacional de Calidad de Vida <https://www.datos.gov.co/Estadisticas-Nacionales/Encuesta-Nacional-de-Calidad-de-Vida-ECV-/mz9y-3x9k>

limitation—caveat is that not representative of provinces though pooling 2 years together arguably helps and all regions have at least 40 obs with exception of san andres, choco and la guajira—results for which we refrain from interpreting

TO n org later can redo with latinobarometer, goes back every year to like 95, but at least since 05 has 8 step urbanicity, but top one is 100k and then there is capital ad

and then can do size with province :)

positive relationship with gdp and nil relationship with density right so more developed are denser, thw two correlate at .35, so looking at them simultaneously reveal positive rel with gdp, but negative with density as expected



Figure 5: Colombia Administrative Divisions. File:Colombia administrative divisions <https://commons.wikimedia.org/wiki/>.

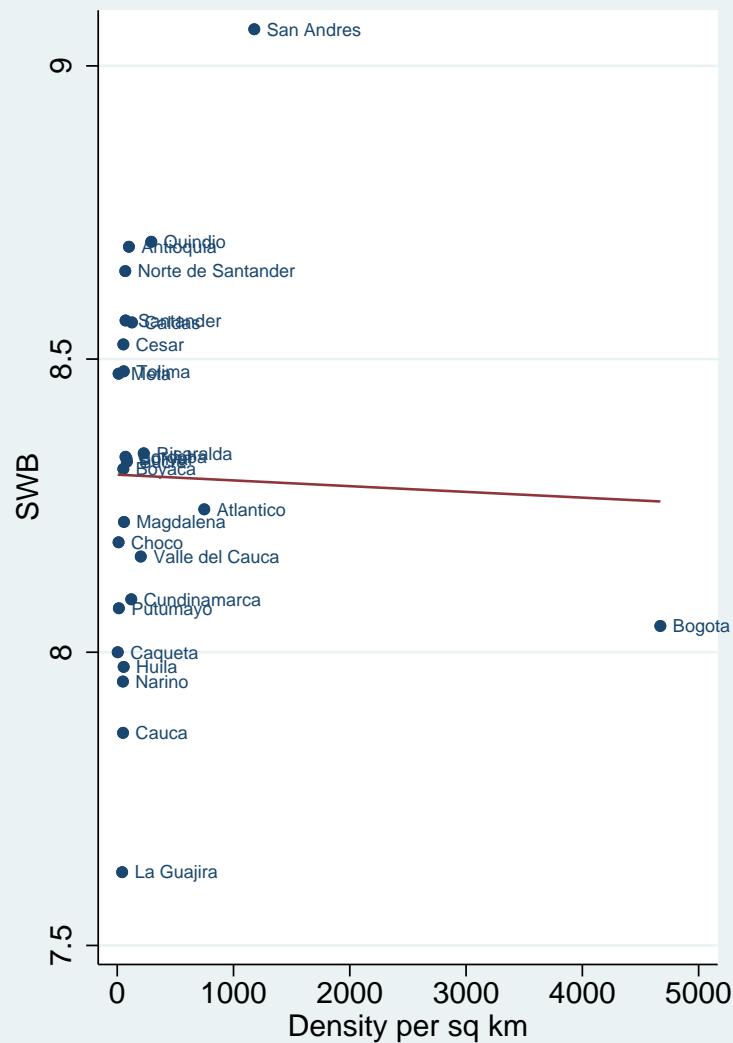
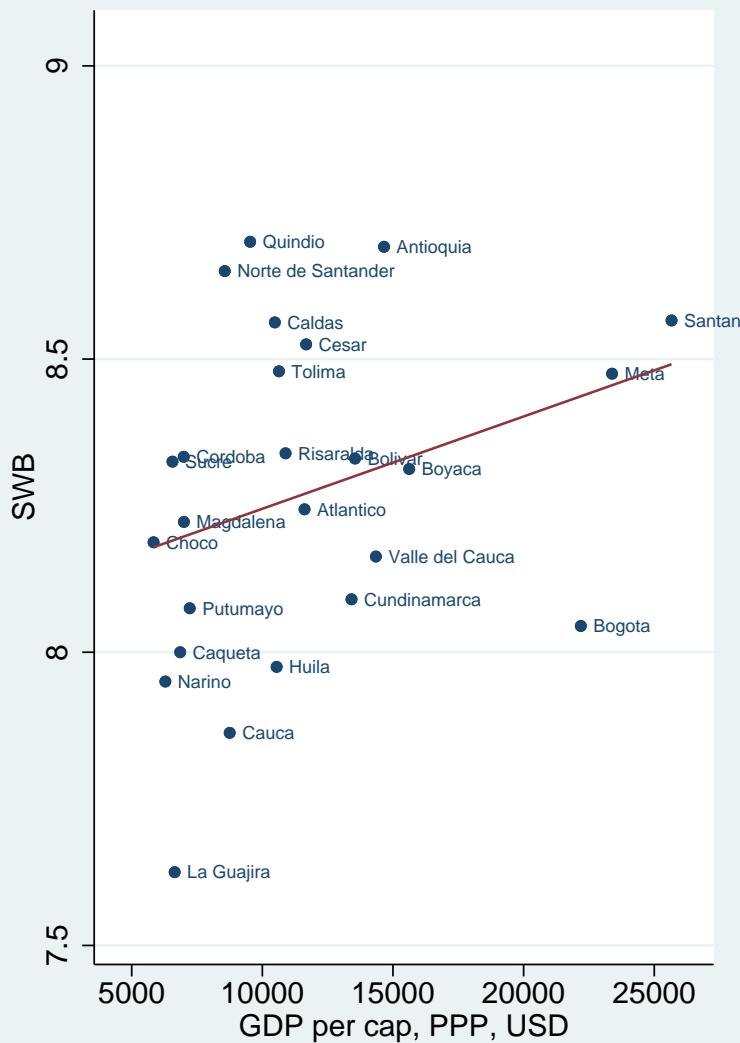


Figure 6: Bivariate relationships

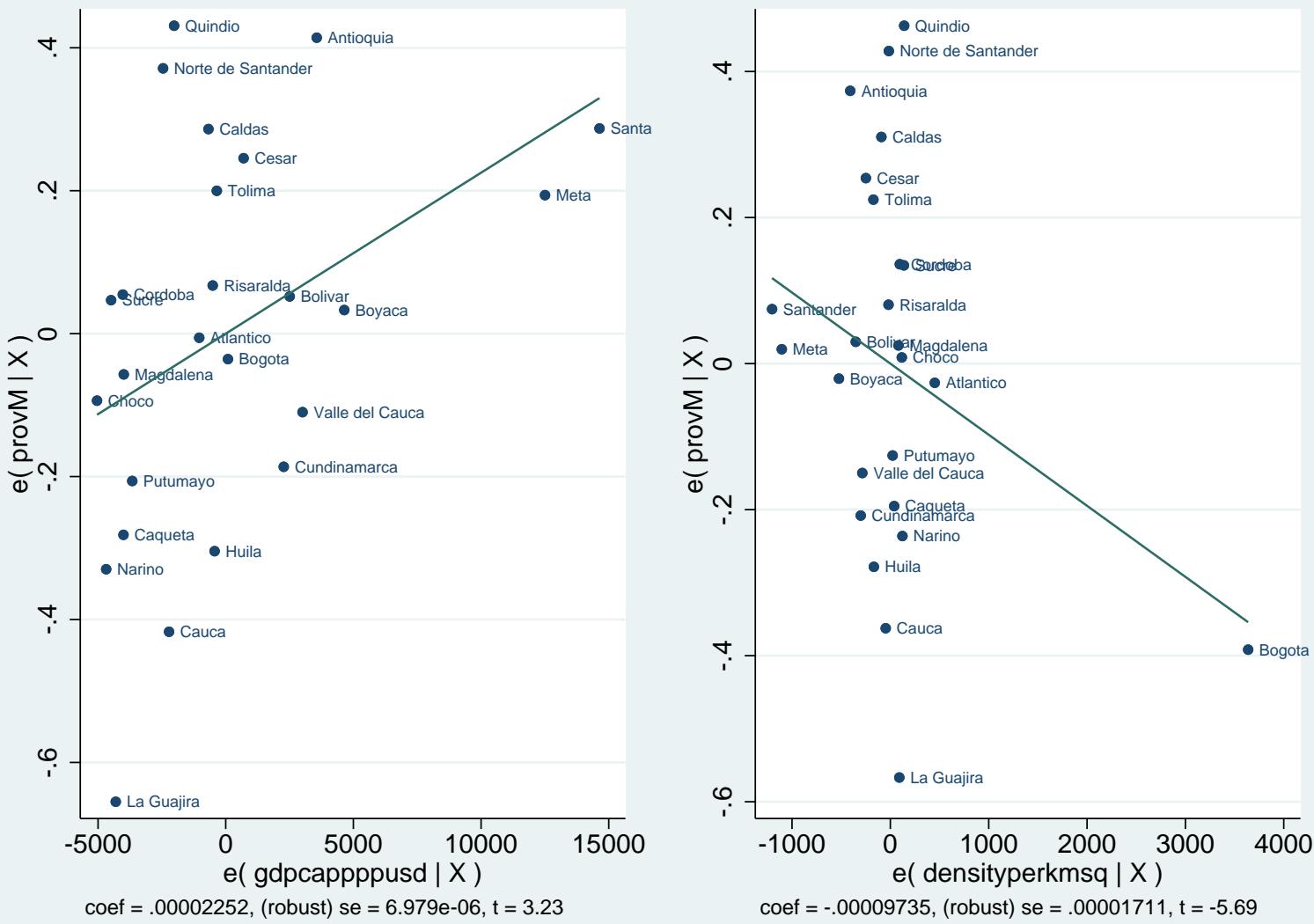


Figure 7: Added Variable Plots relationships

Additional visualizations of the gradient

High Density Living

Contemporary largest cities crowd millions of people at densities of about 25,000/sq km (Manhattan), which is 105 people per acre. Imagine about 3 times larger soccer field (2.7 acre) and 22 people on it (2 teams of 11 players)—it's a livable density—Manhattan has 281 people on it. Of course it is only manageable thanks to towers and underground (subway, tunnels, etc) facilities. And there are dozens of cities more dense than Manhattan, and it is only getting denser and worse.

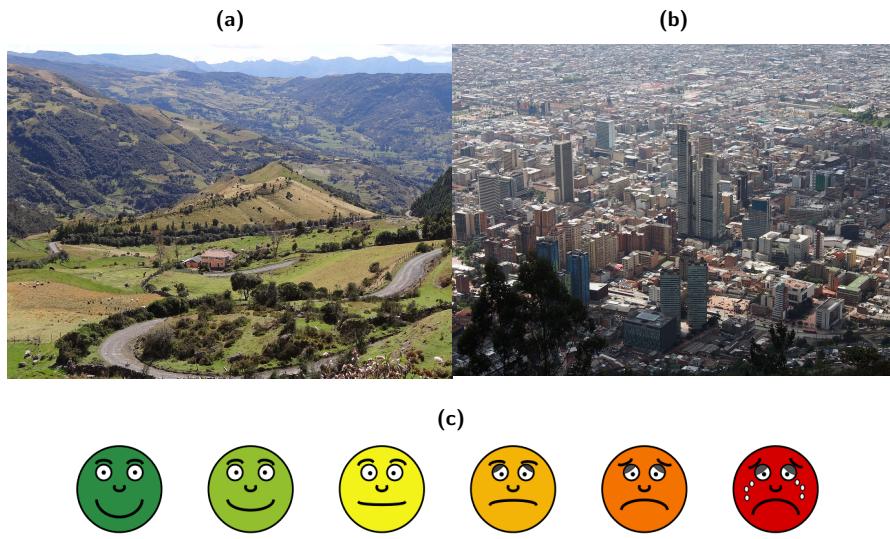
A city of hundreds of thousands of people is a very recent invention in human evolutionary history—there was no such even single place in the world before around 1,000 BC. By 1850 AD only about 2.3% of world population lived in cities larger than 100,000 (Davis 1955).

Some argue that many species, e.g., ants and bees, thrive at high densities, but clearly humans are unlike ants or bees. By one estimate—we're 90% chimp and only 10% bee (Haidt 2012). Small population level and density in a natural setting is humans'

Figure 8: Urban-Rural happiness gradient endpoints. Note that the gradient has multiple steps as illustrated with frownie and smiley emojis, but for simplicity only end points illustrated with photos: very rural v very urban (more photos would make them small and less legible). Images from <https://www.flickr.com/photos/pedrosz/9515685099>, and Bogota Centro International https://commons.wikimedia.org/wiki/File:Bogota_Centro_International.jpg



Figure 9: Urban-Rural happiness gradient endpoints. Images from File:Guican Rural.JPG - Wikimedia Commons, and <https://www.maxpixel.net/Urban-Bogota-Capital-Bogota-Colombia-Architecture-5357148>



evolutionary home, not high population size and density in artificial setting (Pretty 2012). Humans have evolved to live sparsely in a natural environment, not densely in a mixture of concrete, metal, and plastic. Unnatural large population and density is accompanied by a third defining feature of city, heterogeneity or diversity (Wirth 1938). But humans have an ingroup preference or homophily ("love of the same") (McPherson et al. 2001, Tajfel 1982, Tajfel et al. 1971, Smelser and Alexander 1999, Putnam 2007, Fowler and Christakis 2008).

Urbanization Measures From Wikipedia

Quite a growth, in 1950 no city larger than a million, now 5 such cities and notably Bogota close to 10m. All five largest Colombian cities increased more than 5x times since 1950, and even about as much as 10x.

Figure 10: Urban-Rural happiness gradient endpoints. Images from File:Guican Rural.JPG - Wikimedia Commons, and bogota, landscape, bogotá, city, architecture, urban, panoramic, capital, cities, viewpoint <https://www.pxfuel.com/en/free-photo-xiffs>

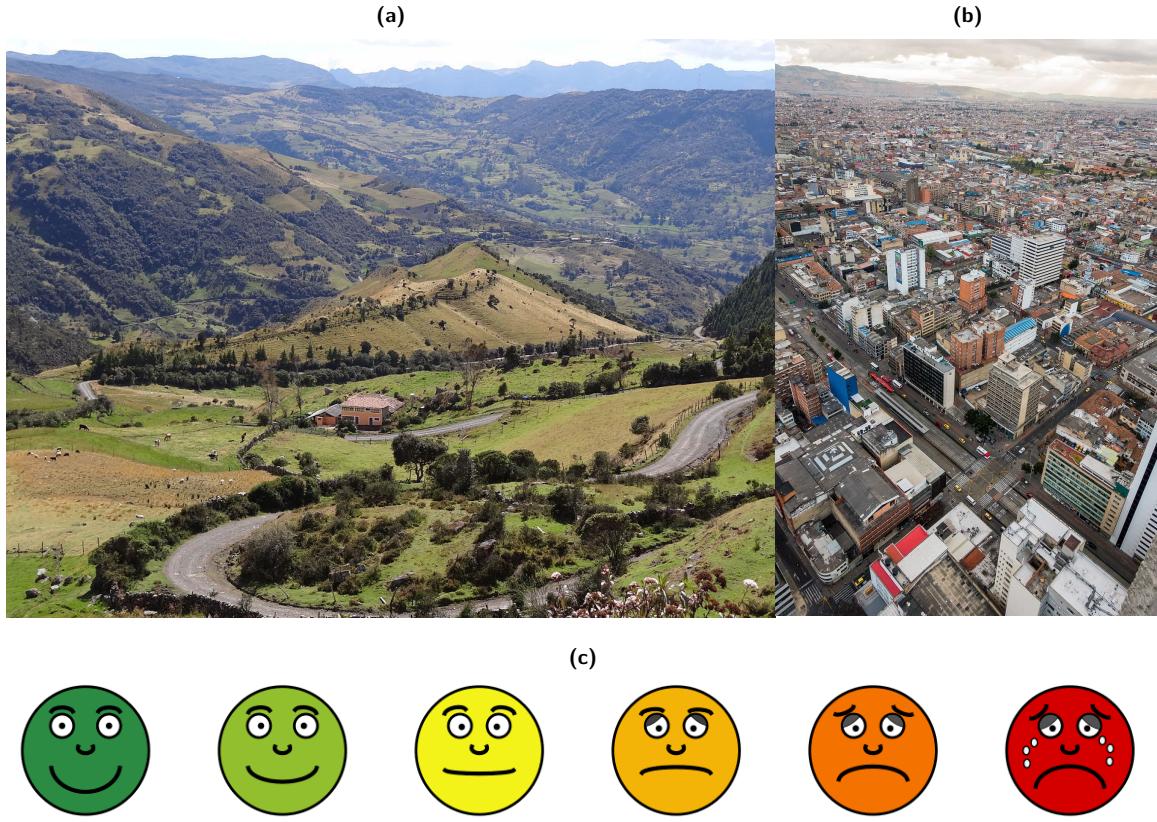


Table 6: 10 largest Colombian Cities. Data source: Wikipedia.

rank	city	2018 population	1950 population	density (thousands per sq km)
1	Bogota	8m	.7m	4.3
2	Medellin	2.5m	.4m	6.9
3	Cali	2.4m	.2m	3.6
4	Barranquilla	1.2m	.2m	7
5	Cartagena	1m	.1m	1.6
6	Cucuta	.7m		
7	Soledad	.7m		
8	Ibagué	.6m		
9	Soacha	.5m		
10	Bucaramanga	.5m		

2018 population: http://www.dane.gov.co/files/investigaciones/poblacion/proyepobla06_20/ProyeccionMunicipios20052020.xls

1950 population: Bogota [https://web.archive.org/web/20120403010130/http://www.dane.gov.co/files/censo2005/PERFIL_PDF\(CG2005/11001T7T000.PDF](https://web.archive.org/web/20120403010130/http://www.dane.gov.co/files/censo2005/PERFIL_PDF(CG2005/11001T7T000.PDF)

Medellin: Suramericana de Seguros (1988), Historia de Antioquia. Editorial Presencia Ltda.(Edicion especial no tiene ISBN) Medellin. pp. 299.

Cali: (Dávila 2001)

Barranquilla: [https://en.wikipedia.org/wiki/National_Administrative_Department_of_Statistics_\(Colombia](https://en.wikipedia.org/wiki/National_Administrative_Department_of_Statistics_(Colombia)

Cartagena: https://en.wikipedia.org/wiki/Cartagena,_Colombia

Density: Wikipedia Websites for each city