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ORIGINAL

Subjective Quality of Life in Latin American

Calidad de vida subjetiva en América Latina

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ABSTRACT

This study analyzes the most appropriate variables to measure the subjective quality of life in Latin America, estimating for this purpose an ordered logistic regression for Buenos Aires, Santiago, San Pablo, Bogota, Panama, La Paz, Mexico City, Caracas, City, Quito, Lima, and Montevideo. The model was able to confirm that the subjective quality of life in the Latin American cities is greatly influenced by the satisfaction that individuals report with their housing and work. We also established that individuals' well-being in Latin America is linked to having decent housing and work, which contrasts with the high rates of poverty, unemployment, and informality in these countries.

Keywords: Quality Of Life; Latin America; Ordered Logistic Regression; Capital Cities.

RESUMEN

Este estudio analiza las variables más apropiadas para medir la calidad de vida subjetiva en América Latina, estimando para ello una regresión logística ordenada para Buenos Aires, Santiago, San Pablo, Bogotá, Panamá, La Paz, Ciudad de México, Caracas, Ciudad, Quito, Lima y Montevideo. El modelo pudo confirmar que la calidad de vida subjetiva en las ciudades latinoamericanas está muy influida por la satisfacción que los individuos reportan con su vivienda y su trabajo. También establecimos que el bienestar de los individuos en América Latina está ligado a tener una vivienda y un trabajo decentes, lo que contrasta con las altas tasas de pobreza, desempleo e informalidad en estos países.

Palabras clave: Calidad de Vida; América Latina; Regresión Logística Ordenada; Capitales.

INTRODUCTION

In Latin America, the abundance of natural resources has not contributed to reducing the unfavorable conditions of the population, so there has been no significant improvement in welfare indicators. Within this perspective, it can also be argued that public policies should aim to help improve the population's quality of life. Therefore, the quality-of-life indicators must make an adequate assessment of the well-

being of individuals. Despite the above, quality of life measurements as an assessment of individual well-being can be distorted for political purposes (Chisadza & Bittencourt, 2019; Falvin, 2019).

However, public policies are based on situational diagnoses and make use of quantitative indicators. For this reason, no account is taken of factors associated with the subjectivity of individuals, which is reflected in their perceptions of their environment (Kaklauskas et al., 2018; Skevington, S. M., & Böhnke, 2018; Kubickova et al., 2017).

In this context, the subjective quality of life must be included in the measurements made of the well-being of a population (Sechel, 2021). In line with the above, Nevado-Peña (2019) and Hu and Das (2019) showed that quality of life could be established as sustainable development of the purpose, through the objective and subjective assessment of the social, economic, and environmental environment.

The definitions offered for quality of life are multiple, and all of them agree that it has a multidimensional character (Allirani et al., 2024). For example, Sen (2017) argued that quality of life implies that each person has good living conditions, coupled with a high subjective quality of life, so it can be interpreted as the ability to achieve standards for everyone, according to the valuation that makes them happy.

Along Sen's lines, the United Nations Organization (UN) designed the Human Development Index in 1990, taking this author's theoretical conception as a reference. This is a synthetic indicator that takes three aspects: (a) average years of education of adults over 25 years; (b) GDP per capita and (c) life expectancy. However, this indicator does not consider that quality of life is a subjective assessment of the material environment, and in this context, there is no agreement as to which dimensions should be considered (Rogge & Van Nijverseel, 2019).

There are other indexes to quantify the quality of life, such as the Legatum index of prosperity, which includes 104 variables and nine pillars; the Mercer index that assigns values for perceptions of a qualitative nature, in different cities; the "Weighted Index of Social Progress" (WISP) that carries out a metric of quality of life at a national level and the "Index of the Well-being of Nations" that is based on four components that are income distribution, per capita consumption , net social accumulation of productive resource stocks, and economic security against poverty in old age unemployment, single parent poverty and ill health.

It should be noted that the above-mentioned indices do not make distinctions associated with the particularities of each region so that the weightings given to each aspect are standardized for all nations or cities indistinctly. In this context, it is important to consider the particularities associated with the environment in the population's perception of the variables that individuals consider important for increasing their well-being (Biagi et al., 2018)

Deepening the conceptual analysis of subjective quality of life, the perception that the individual reports with his life are related to the implicit or explicit internal standard of an individual (Leontiev, 2020; Sujarwoto, 2021). It can be measured through a survey, in which the respondents were asked about their happiness, health, and wellbeing. This given that the quality of life is associated with political, social, and economic inclusion (Nevado-Peña et al, 2019; Aroca et al, 2017).

Another important benchmark is the study by (Juknys et al, 2018). This work identified that in OECD countries, the analysis of long-term changes in GDP and life satisfaction supports the Easterlin paradox. It indicates that richer people are not more satisfied with their lives.

Kubiszewski et al. (2019) stated that the Gross Domestic Product is a measure of economic progress of countries, although it omits many welfare-enhancing components, such as domestic work, the informal economy, and does not consider the distribution of wealth and income.

Nevado-Peña et al (2019) using the Eurobarometer and Eurostat data on Information and Communication Technology, analyzed the factors that are important for a better quality of life in Europe. Their findings include that the technology improves the quality of life; the digital citizen feels happier, and, investment in research and development is needed to achieve sustainable growth.

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In this sense, Pătărlăgeanu et al. (2020) identified the correlations between quality of life and strong labor investment, taking data from Eurostat and the World Bank found that in the European States analyzed, investing in work by increasing the volume of work is not a justified measure, because its effects are not directly evident on social and economic progress.

Specifically, in the test carried out for Latin America, Valente y Berry (2016) using information from the "World Values Survey and the Barometer of the Americas" and through estimation of ordinal logistic models to evaluate satisfaction with life in the urban and rural areas of Latin America, found that, unlike the United States, in Latin America, there is no evidence of differences in rural-urban happiness. Furthermore, in Latinamerica, the family is the key driving force, while for the Anglo-Saxon culture, place of residence is an important aspect of life satisfaction, which the individual reports.

Along this path, this study takes data from ten Latin American cities and examines how the satisfaction that individuals report concerning their work, housing, proximity to means of transportation, commute distance, and the city where they live, affects the subjective quality of life. For this reason, an orderly logit model is considered.

METHODS

Data

The survey CAF Survey in 2017 (CAF, 2017) collects socioeconomic and demographic information from respondents. The data was taken from the urban population between the ages of 20 and 60, residing in La Paz, Santiago, Bogotá, São Paulo, Buenos Aires, Mexico City, Panama City, São Paulo, Caracas, Lima, São Paulo, and Montevideo. The survey methodology was a stratified, multi-stage cluster sample design.

Model

The estimation was made through an ordinal logit model, where the dependent variable, the subjective quality of life, was rated by the individual on a scale from 1 to 10 (P3), and the explanatory variables were the answers to the following survey questions:

Q12: How satisfied are you with your home?

Q13_1: How satisfied are you with the size of your household?

Q13_2: How satisfied are you with the proximity to transportation?

Q13_3: How satisfied are you with the following attributes of your dwelling? Distance from the main activity?

Q51: How satisfied are you with your work?

In the ordinal family, the answer Z is assumed to assume one of s unique values. Values are supposed to correlate with "higher" results. It is supposed that Z assumes the values 1,2, …, s. The ordinal family has cut points s_o, s_1, s_2,…, s_s; $s_o = -\infty$, $s_z < s_{z+1}$ and $s_s = \infty$.

According to Fagerland & Hosmer (2017) a linear prediction h, the probability that Z take the value m,

$$Pr(Z = m \mid h) = Pr(Z^* < s_{m-h}) - Pr(Z^* < s_{m-1-h}). \quad (1)$$

Z* is the underlying stochastic component, the distribution of Z* is determined by the link function. The link logit assigns Z * the extreme value distribution.

The variables used are the response on a scale between 1 and 10. Being 1 "Not at all satisfied" and 10 "Completely satisfied", so they are variables on a discrete ordinal scale. It is assumed that the answer Z takes one of s unique values.

Z is assumed to assume the values 1, 2, ... n. With n results has cut-off points n_0; n_1;...., n_s, where $n_0 = -\infty$, n and $< n_{z+1}$ and $n_n = \infty$. Coefficients and cut-off points are estimated using the maximum likelihood.

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The cut-off points show the effect of the constant. In an ordered logit the probability of an observation is:

$$P_{ij} = Pr(z_j = i) = Pr= (n_i-1 < x_j\beta + u \leq n_i\ ) \quad (2)$$

$$P_{ij} = (1/(\ 1 + \exp(-n_i + n_j\beta)) - (\ 1/(\ 1 + \exp(-n_{\ i-1} + x_j\beta) \quad (3)$$

Finally, cut1..... cut9 are the cut-off points of the ordered logit, the values in the distribution of the logit that separates the different levels of satisfaction.

RESULTS

The estimated model is found in Figure 1. In this model, the subjective quality of life is explained by the responses that the surveyed provided.

Survey: Ordered logistic regression

Number of strata	=	73	Number of obs	=	6,497
Number of PSUs	=	2,078	Population size	=	23,905,456
			Design df	=	2,005
			F(15, 1991)	=	54.44
			Prob > F	=	0.0000

p3	Coef.	Linearized Std. Err.	t	P>|t|	[95% Conf.	Interval]
p12	.3649451	.0244304	14.94	0.000	.3170335	.4128566
p13_1	.0179557	.0194992	0.92	0.357	-.0202851	.0561966
p13_2	.0530762	.0189394	2.80	0.005	.0159333	.0902191
p13_3	.0348596	.0170355	2.05	0.041	.0014505	.0682687
p51	.2941397	.0225923	13.02	0.000	.2498329	.3384466
ciudad						
La Paz	-.6316167	.112321	-5.62	0.000	-.8518948	-.4113386
San Pablo	-.2864576	.1375624	-2.08	0.037	-.5562378	-.0166774
Bogotá	.1456526	.1066947	1.37	0.172	-.0635915	.3548968
Quito	-.1314579	.1083237	-1.21	0.225	-.3438966	.0809808
Lima	-.4200082	.1167559	-3.60	0.000	-.6489839	-.1910326
Montevideo	-.1878349	.1047904	-1.79	0.073	-.3933443	.0176746
Caracas	-.0782425	.1422523	-0.55	0.582	-.3572202	.2007353
Ciudad de Panamá	.1719892	.127921	1.34	0.179	-.0788828	.4228612
Ciudad de México	.0100315	.1085906	0.09	0.926	-.2029308	.2229937
Santiago	-.1055996	.109725	-0.96	0.336	-.3207865	.1095873
/cut1	.3508693	.2905611			-.2189639	.9207026
/cut2	.8868288	.2524621			.3917133	1.381944
/cut3	1.345247	.2387072			.8771064	1.813387
/cut4	2.064029	.2275713			1.617728	2.51033
/cut5	3.378034	.2410494			2.9053	3.850767
/cut6	4.119884	.2475904			3.634323	4.605446
/cut7	5.213189	.2588626			4.705522	5.720857
/cut8	6.627644	.2791456			6.080198	7.17509
/cut9	7.612227	.2887516			7.045943	8.178512

Figure 1. Ordered logit model, own elaboration using Stata (StataCorp, 2015)

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Self-reported life satisfaction encompasses ten categories. Categories 1 through 6 are expected to denote negative categories, while categories 8 through 10 denote positive categories. It was explored whether the distinctions between the positive categories and the two negative categories occur according to a latent dimension, which is an assumption of the ordered logistic model. To test for one-dimensionality, the 10-point quality of life measure was collapsed into a three-point measure, fitting the ordered logistic model and comparing the regression effects of the regression coefficients and cut-off points between the two analyzes. If the single latent variable assumption is valid, the coefficients and cut points must match.

To corroborate this, the Hausman specification test could be used. However, the estimation of the parameters of the ordered logistic model for the survey data is different. So, none of the estimators is fully efficient, and therefore the assumptions for the classical Hausman test are not met.

Given the above, the results of the parameter estimates and associated simultaneous sandwich/robust covariance matrices were combined. Thus, this covariance matrix is appropriate, therefore, a Hausman test is appropriate for the survey data.

Wald's test was performed, adjusted for the hypothesis that the regression coefficients are in fact the same for the initial model and the model with collapsed values; as would be expected, there is a one-dimensional latent dimension for quality of life; and the null hypothesis, which indicates that the ordered logistic regression model was poorly specified, was rejected (Figure 2).

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Adjusted Wald test

 ( 1)  [H5_p3]p12 - [H3_nnp3]p12 = 0
 ( 2)  [H5_p3]p13_1 - [H3_nnp3]p13_1 = 0
 ( 3)  [H5_p3]p13_2 - [H3_nnp3]p13_2 = 0
 ( 4)  [H5_p3]p13_3 - [H3_nnp3]p13_3 = 0
 ( 5)  [H5_p3]p51 - [H3_nnp3]p51 = 0
 ( 6)  [H5_p3]1b.ciudad - [H3_nnp3]1b.ciudad = 0
 ( 7)  [H5_p3]11.ciudad - [H3_nnp3]11.ciudad = 0
 ( 8)  [H5_p3]21.ciudad - [H3_nnp3]21.ciudad = 0
 ( 9)  [H5_p3]31.ciudad - [H3_nnp3]31.ciudad = 0
 (10)  [H5_p3]41.ciudad - [H3_nnp3]41.ciudad = 0
 (11)  [H5_p3]51.ciudad - [H3_nnp3]51.ciudad = 0
 (12)  [H5_p3]61.ciudad - [H3_nnp3]61.ciudad = 0
 (13)  [H5_p3]71.ciudad - [H3_nnp3]71.ciudad = 0
```

Figure 2. Adjusted Wald test, own elaboration using Stata (StataCorp, 2015)

As can be seen, the empirical evidence showed that satisfaction with housing, proximity to means of transport, distance from the main activity, and work are significant variables at the 1% significance level, and increasing satisfaction with some of these aspects, or decreasing the probability that the individual will rate his satisfaction with his life, between 1 and 8, while increasing the probability that the individual will rate his satisfaction with his life between 9 and 10. Satisfaction with home size was not a significant variable.

Besides, individuals living in La Paz, São Paulo, Lima, and Montevideo are less likely to rate their satisfaction with their quality of life as between 9 and 10.

When the marginal effects were plotted, it was observed, the variables that most positively influence the probability the individual will rate his satisfaction with his life between 9 and 10; are the satisfaction with his home and work associated with the magnitude of the estimated betas (Figure 3). While the city in which the individual lives is the variable that most decreases the probability that the individual has a good subjective quality of life.

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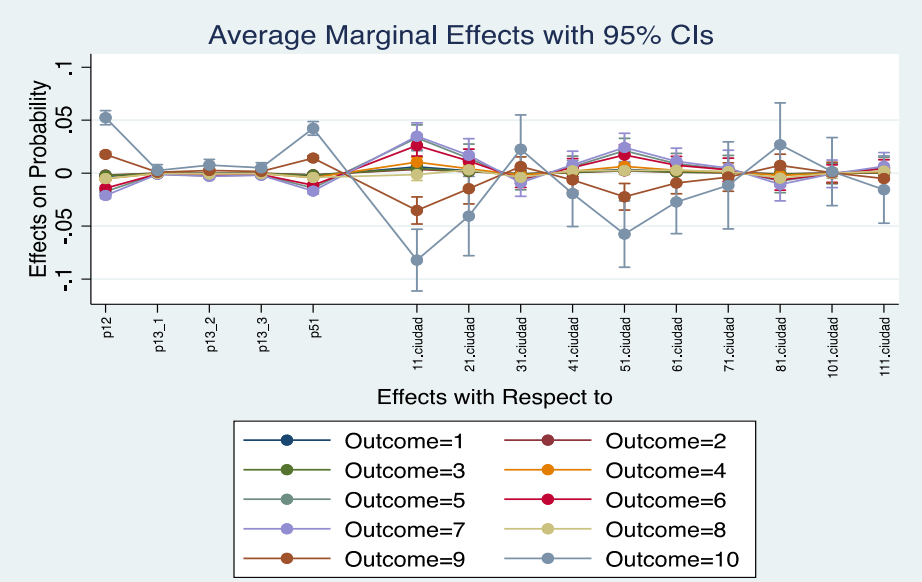

Figure 3. Average marginal effects with 95% Cls, own elaboration using Stata (StataCorp, 2015)

The adjustment assessment identified outliers; to identify cases where the observed value was farther from the predicted value. And it was found that for satisfaction levels between 1 and 7, outliers were individuals who reported high levels of satisfaction with housing, size of housing, closeness to transportation, distance to the main activity and to work; while for levels 8 to 10, outliers were individuals who reported low satisfaction with the aspects mentioned above.

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Survey: Ordered logistic regression

Number of strata   =        73                  Number of obs      =       6,497
Number of PSUs     =     2,078                  Population size    =  23,905,456
                                                 Design df          =       2,005
                                                 F(   2,    2004)   =      366.64
                                                 Prob > F           =      0.0000
```

p3	Coef.	Linearized Std. Err.	t	P>|t|	[95% Conf.	Interval]
_hat	.1425264	.2209052	0.65	0.519	-.2907015	.5757542
_hatsq	.0785555	.0196866	3.99	0.000	.0399472	.1171638
/cut1	-1.759857	.6239627			-2.98354	-.5361742
/cut2	-1.238913	.6092207			-2.433685	-.0441409
/cut3	-.7966086	.6070271			-1.987079	.3938614
/cut4	-.1032514	.6012677			-1.282426	1.075923
/cut5	1.164823	.6063941			-.0244056	2.354052
/cut6	1.88711	.6140163			.682933	3.091287
/cut7	2.968606	.6215606			1.749634	4.187578
/cut8	4.400911	.6248859			3.175417	5.626404
/cut9	5.409167	.6241178			4.18518	6.633155

Figure 4. Binding test, own elaboration using Stata (StataCorp, 2015)

To identify the effects of the independent variables on the subjective quality of life, the test was carried out to evaluate if each one of these variables; has a significant effect on the probabilities that the individual qualifies, the satisfaction with his life in the different levels; finding that the only non-significant variable was the satisfaction with the size of the house.

Finally, the linkage test was performed (Figure 4), which revealed that there is no problem with the specification of the model since the linear prediction has no explanatory power, as shown in the table below. The above makes sense if we consider that in a linear model, the estimated betas are not

restricted to the zero interval and one, therefore, cannot be interpreted as probabilities; Furthermore, the estimated betas do not directly reflect the magnitude but rather provide the direction in which the probability oscillates, about the highest category.

CONCLUSIONS

Given the results found, it could be concluded that the estimated model presents a good fit and specification, providing important information about the variables that affect the subjective quality of life in an urban population between 20 and 60 years old, of 23,905,456 residents in Quito, Buenos Aires, Panama City, La Paz, San Pablo, Santiago, Bogotá, Mexico City, Lima, Caracas, and Montevideo.

The model was able to bear out that the subjective quality of life in the Latin American cities studied is greatly influenced by the satisfaction that the individuals report with their housing and work. The above results confirm what was found by Hosseini et al. (2023) and Zhang et al. (2023), who showed that informal housing is a factor that influences life satisfaction.

Within this perspective, in Latin America, individuals' well-being is linked to having decent housing and work, which contrasts with the high rates of poverty, unemployment, and informality that these countries present compared to other nations. However, the limitations of this study are compounded by the availability of data up to 2017. Finally, for future research, this same analysis could be done using a supervised learning algorithm.

REFERENCES

1. Allirani, H., Dumka, A., & Verma, A. (2024). A framework for assessment of pedestrianization impacts on quality of life: Combining subjective and objective measures. Cities, 145, 104688. https://doi.org/10.1016/j.cities.2023.104688

2. Aroca, P., Gonzalez, P. A., & Valdebenito, R. (2017). The heterogeneous level of life quality across Chilean regions. Habitat International, 68, 84-98. https://doi.org/10.1016/j.habitatint.2017.06.010

3. Biagi, B., Ladu, M. G., & Meleddu, M. (2018). Urban quality of life and capabilities: An experimental study. Ecological Economics, 150, 137-152. https://doi.org/10.1016/j.ecolecon.2018.04.011

4. CAF. (2017).Encuesta CAF 2017: trayectorias laborales y productivas en América Latina. Retrieved from http://scioteca.caf.com/handle/123456789/1400

5. Chisadza, C., & Bittencourt, M. (2019). Economic development and democracy: The modernization hypothesis in sub-Saharan Africa. The Social Science Journal, 56(2), 243-247. https://doi.org/10.1016/j.soscij.2018.10.007

6. Fagerland, M. W., & Hosmer, D. W. (2017). How to test for goodness of fit in ordinal logistic regression models. The Stata Journal: Promoting Communications on Statistics and Stata, 17(3), 668-686. https://doi.org/10.1177/1536867X1701700308

7. Flavin, P. (2019). State government public goods spending and citizens' quality of life. Social Science Research, 78, 28-40. https://doi.org/10.1016/j.ssresearch.2018.11.004

8. Hosseini, A., Finn, B. M., & Momeni, A. (2023). The complexities of urban informality: A multi-dimensional analysis of residents' perceptions of life, inequality, and access in an Iranian informal settlement. Cities, 132, 104099. https://doi.org/10.1016/j.cities.2022.104099

9. Hu, S., & Das, D. (2019). Quality of life among older adults in China and India: Does productive engagement help? Social Science & Medicine, 229, 144-153. https://doi.org/10.1016/j.socscimed.2018.06.028

10. Juknys, R., Liobikienė, G., & Dagiliūtė, R. (2018). Deceleration of economic growth—The main course seeking sustainability in developed countries. Journal of Cleaner Production, 192, 1-8. https://doi.org/10.1016/j.jclepro.2018.04.231

11. Kaklauskas, A., Zavadskas, E. K., Radzeviciene, A., Ubarte, I., Podviezko, A., Podvezko, V., Kuzminske, A., Banaitis, A., Binkyte, A., & Bucinskas, V. (2018). Quality of city life multiple criteria analysis. Cities, 72, 82-93. https://doi.org/10.1016/j.cities.2017.08.002

12. Kubickova, M., Croes, R., & Rivera, M. (2017). Human agency shaping tourism competitiveness and quality of life in developing economies. Tourism Management Perspectives, 22, 120-131. https://doi.org/10.1016/j.tmp.2017.03.002

13. Kubiszewski, I., Jarvis, D., & Zakariyya, N. (2019). Spatial variations in contributors to life satisfaction: An Australian case study. Ecological Economics, 164, 106345. https://doi.org/10.1016/j.ecolecon.2019.05.025

14. Leontiev, D. (2020). Quality of life and well-being: Objective, subjective and agentic aspects. Psikhologicheskii zhurnal, 41(6), 86-95. https://doi.org/10.31857/S020595920012592-7

15. Nevado-Peña, D., López-Ruiz, V.-R., & Alfaro-Navarro, J.-L. (2019). Improving quality of life perception with ICT use and technological capacity in Europe. Technological Forecasting and Social Change, 148, 119734. https://doi.org/10.1016/j.techfore.2019.119734

16. Pătărlăgeanu, S. R., Rădulesc, C. V., Dinu, M., & Constantin, M. (2020). The impact of heavy work investment on the economy and the individual. Amfiteatru Economic, 22(14), 1085-1102.

17. Rogge, N., & Van Nijverseel, I. (2019). Quality of life in the european union: A multidimensional analysis. Social Indicators Research, 141(2), 765-789. https://doi.org/10.1007/s11205-018-1854-y

18. Sechel, C. (2021). The share of satisfied individuals: A headcount measure of aggregate subjective well-being. Journal of Economic Behavior & Organization, 186, 373-394. https://doi.org/10.1016/j.jebo.2021.03.036

19. Sen, A. (2017). Collective choice and social welfare (An expanded edition. First Harvard University Press edition.). Harvard University Press.

20. Skevington, S. M., & Böhnke, J. R. (2018). How is subjective well-being related to quality of life? Do we need two concepts and both measures? Social Science & Medicine, 206, 22-30. https://doi.org/10.1016/j.socscimed.2018.04.005

21. Sujarwoto, S. (2021). Development as happiness: A multidimensional analysis of subjective well-being in Indonesia. Economics & Sociology, 14(2), 274-293. https://doi.org/10.14254/2071-789X.2021/14-2/15

22. Valente, R. R., & Berry, B. J. L. (2016). Working hours and life satisfaction: A cross-cultural comparison of latin america and the united states. Journal of Happiness Studies, 17(3), 1173-1204. https://doi.org/10.1007/s10902-015-9637-5

23. Zhang, Y., Zhang, B., & Mao, W. (2023). Incomplete-ownership property communities: Informal gated communities in Beijing and the issue of life satisfaction. Cities, 137, 104344. https://doi.org/10.1016/j.cities.2023.104344

FINANCING

None.

CONFLICT OF INTEREST

None.

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