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Exploring the determinants of happiness in Mexico: The interplay of social networks, psychological well-being, and socioeconomic factors

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Abstract: Over recent years, there has been significant growth in research on happiness. It is essential to understand the factors that affect people's well-being to develop effective government policies that aim to improve the quality of life for citizens in Mexico. Unfortunately, this subject has been under-explored, especially in the Mexican context, with limited studies focusing on the topic. This study aims to comprehensively review the current literature on happiness, social networking, psychological factors, and socioeconomic factors to identify the critical variables associated with the happiness of Mexican citizens. Further, based on data from Mexico's 2021 National Survey of Self-reported Well-being (ENBIARE), we conducted a rigorous examination of this dataset to identify the principal factors that impact the well-being of Mexican citizens, employing both exploratory and confirmatory factor analysis.

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1. Introduction

Happiness is an essential component of the human experience and is a shared goal for many. Understanding what contributes to happiness and how we can foster it has significant implications for individuals' overall health and well-being [1]. Happiness is a state of contentment and joy studied for centuries in various fields, including psychology, philosophy, and religion. This exploration has deepened our understanding of human nature and revealed the path to long-lasting well-being [1].

Happiness in engineering and technology teams is a multiplier of productivity and creativity. A positive work environment improves morale and encourages collaboration and innovation. Engineers and technologists face complex problems whose solutions require sharp critical thinking and open-mindedness.

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Happiness catalyzes these cognitive skills, allowing professionals to approach challenges enthusiastically and persistently. Additionally, happy teams have better communication, which is crucial in fields where mistakes can be costly and details are vital. Job satisfaction reduces staff turnover, preserving experience and knowledge within the company. According to research, one example of this relevance in technical teams is the impact of leadership on employee happiness [2]. Leaders who display empathy and support during professional and personal challenges contribute to a more people-focused workplace. Adopting such an approach can result in increased levels of employee satisfaction and loyalty.

The INEGI (Mexican National Institute of Statistics, Geography, and Informatics) measures various socioeconomic aspects such as GDP, productivity, and social indicators. The ENBIARE (National Survey of Self-Reported Well-being) also seeks to gather data on citizens' well-being, including health, social networks, socioeconomic conditions, and safety factors. From this database, we raise some research questions to understand the relevance of happiness in Mexican society. 1) How do different social networking platforms impact the happiness and well-being of Mexican citizens? 2) How do socioeconomic factors like income, social class, safety, and access to healthcare and education influence the happiness of Mexican citizens? This paper explores the effects of various social media platforms, like Facebook, Instagram, Twitter, WhatsApp, Telegram, and TikTok, on the perception of happiness and well-being. Rather than that, we focus our analysis on understanding the impact of socioeconomic conditions on happiness in Mexico.

2. Literature Review

The Mexican ENBIARE survey [3] includes social networking sites like Facebook, Instagram, Twitter, WhatsApp, Telegram, and TikTok. These sites have a significant impact on citizens. For example, young women who spend more time on social media may have less access to health information and a poorer diet [4].

If we focus on the previously mentioned social media platforms, they significantly impact people's happiness in Mexico, especially those in the technology field. For technology professionals, who are often at the forefront of adopting new digital tools, these platforms offer numerous benefits that can positively influence their well-being. For instance, Facebook and Instagram provide spaces for showcasing personal and professional accomplishments, as well as for inspiration through viewing the work of colleagues and industry leaders. This spaces helps develop a sense of community and belonging, as well as provide networking opportunities that are crucial for professional growth. Twitter is a powerful tool for keeping up with technology trends and breaking news, allowing professionals to stay informed and engage in conversations relevant to their field. WhatsApp and Telegram offer direct communication platforms and groups that facilitate collaboration on projects, sharing ideas, and building a sense of camaraderie among coworkers, which can be particularly valuable for those working remotely or in distributed teams. Finally, TikTok can serve as a creative outlet and source of entertainment, offering a needed break from the rigors of technology work and allowing users to share and consume content more relaxed and often humorously.

However, the impact of these networks could be more uniformly positive. Over-connection can lead to burnout and social comparison and breed dissatisfaction and negative emotions. The key for technology professionals in Mexico and elsewhere is to find a healthy balance, using these tools to enhance professional connection and satisfaction without letting them dominate the sense of happiness and well-being in personal life.

If we want to promote healthy lifestyles, it is essential to keep track of how much time people spend online. Social scientists conducted numerous studies on the impact of social media on mental and social well-being [5]. They observed that moderate use of social networking sites is associated with increased

happiness and decreased anxiety [6]. In the past, outgoing and social individuals were often viewed as famous and believed to receive more social support, leading to better mental health.

According to a study by Ginja [6], there is a negative correlation between agreeableness and depressive and stress symptoms. Another survey by Wang [7] found that Facebook users who leave encouraging comments on others' status updates receive more positive responses to their posts, which can lead to increased happiness and feelings of support [8]. When people share their feelings of hesitation, pressure, depression, and enthusiasm with online friends, they tend to receive emotional and informational support that can ultimately lead to greater satisfaction and happiness [6]. Social networks like Facebook also help users develop closer relationships with their friends by providing emotional and informational support, increasing their overall happiness and contentment [9].

While social networks can be a great way to connect people, they have limitations. It only benefits extroverted individuals. Excessive use of social networks can negatively affect the happiness of individuals who feel lonely and unhappy with their social contacts. However, there is no correlation between excessive social network use and the happiness of young adults with high-quality individual social capital [10, 11]. According to Jin [11], lonely people are less satisfied with social networks as a medium for communication.

Psychological factors play a significant role in determining how happy we are. When we experience life satisfaction and self-realization, our happiness increases. Conversely, depression, stress, and anxiety can cause our happiness levels to decrease. Regardless of a person's culture or nationality, meeting their basic psychological needs immediately and positively impacts their happiness. Addressing these needs can lead to a more stable attachment, better relationships, reduced perceived conflict, and better resolution. It is essential to note that family support has a significant impact on the health of older citizens. If we want to improve the well-being of parents and children and help them deal with negative feelings, it is crucial to encourage them to spend more time interacting with each other [12].

Boosting social support for elderly citizens can enhance their moral sensibility. The feelings of social support and contentment are significant principles of older people's well-being and morality. For instance, training and caring programs for elders can provide social support and boost their spirits [13]. Their well-being and subjective welfare profoundly and individually influence people's perceptions of leading a good life. Therefore, subjective well-being and leading a good life are critical aspects of public policy in efforts to improve well-being and welfare [14]. Apart from the usual physical and psychological needs, 'meaningfulness' and 'peace of mind' significantly contribute to subjective well-being or happiness. Peace of mind is an adaptive emotion, whereas meaningfulness is an assessment that a particular value or meaning has been met [15].

There are various ways to improve happiness; one such method is positive psychology. Online courses on positive psychology can help reduce anxiety and depression effectively since they offer personalized learning to cater to individual needs and preferences in contrast to face-to-face courses [16]. Many physical illnesses, such as cardiovascular diseases, can also impact mental health. People with cardiovascular diseases may experience anxiety and depression, and positive psychological therapy can help alleviate these symptoms [17].

In terms of gender, married women tend to report better mental health compared to single women, particularly regarding anxiety, sleeplessness, and depression. Younger women, women who are employed, and those with higher education levels also experience higher rates of depression [18]. Emotional health plays a vital role in a person's ability to work efficiently within a company [19].

Socioeconomic factors, such as income, social class, and safety, can affect happiness. One's subjective social class and mental health are positively correlated. However, subjective social mobility can help mitigate the adverse effects of self-class disparity on happiness and mental health [20]. In Mexico, citizens are concerned about safety due to the ongoing war on drugs. For every increase of one drug-related

homicide per 100,000 inhabitants, there is a corresponding increase of 3.5 to 4.9 percent in non-clinical depression [21]. Additionally, a sense of safety is critical for achieving a high level of happiness, as people who worry about unsafe living conditions tend to be less happy [22].

Economic development leads to an increased demand for healthcare. For example, in China, research associates happiness with mortality, longevity, and self-rated health. Happy citizens will likely have better self-rated health than those who are not because happiness mediates socioeconomic factors, social relationships, and health. There are more discussions now about the impact of social, economic, and environmental factors on happiness and life satisfaction. According to Wang, people with higher incomes tend to be happier [7, 23].

Similarly, having access to healthcare, education, and other public services can improve citizens' quality of life. When formulating policies that positively affect citizens' life satisfaction and happiness, policymakers must consider the economic, social, and environmental factors [24].

3. Methodology

We conducted a comprehensive study to understand the factors that affect happiness in Mexico. Our methodology involved quantitative (survey analysis) and qualitative (literature review) approaches. We aimed to explore the impact of psychological, socioeconomic, and social networking factors on the happiness of citizens in Mexico. We designed the study to provide valuable insights that can guide policy-making decisions and inform further academic research in this area.

3.1. Literature Review

Review literature on happiness, social networking, and psychological and socioeconomic factors to identify potential variables for testing in the Mexican context.

3.2. Data Collection

We utilized data from the 2021 National Survey of Self-reported Well-being (ENBIARE) in Mexico to investigate the relationship between social media usage, mental health indicators (e.g., depression, anxiety), socioeconomic status, and happiness scores. We also collected other relevant demographic information.

The selected variables are detailed in Table 1, each presumed to influence citizens' self-reported happiness significantly. The factor analysis amalgamates these variables into factors that comprehensively understand the primary determinants of happiness.

3.3. Exploratory Factor Analysis (EFA)

We used Statistical software such as SPSS for Principal Component Analysis with an orthogonal varimax rotation. The process was: a) Evaluate the suitability of data for factor analysis (Kaiser-Meyer-Olkin measure and Bartlett's test of sphericity). b) Identify the number of factors (using eigenvalues and scree plots). c) Determine the factor loadings and communalities. d) Decide on factor retention based on eigenvalues >1 and communalities threshold.

3.4. Confirmatory Factor Analysis (CFA)

We verified the factor structure that we identified in the EFA. The process involved the following steps: a) If needed, factor analysis was re-run based on variables like social life satisfaction. b) The factor structure was finalized considering the variance explained and the component matrix. c) Principal component analysis rotation was applied to refine the model. d) The factors were named according to the variable content.

Table 1. Independent variants associated with Mexican citizens' happiness or subjective well-being.

Label	Variant	Measurement Scale
PA1	General well-being	00-10
PA3_01	Standard of living satisfaction	00-10
PA3_02	Health satisfaction	00-10
PA3_05	Social life satisfaction	00-10
PA3_06	Family life satisfaction	00-10
PA3_11	Citizen security satisfaction	00-10
PA3_13	Home satisfaction	00-10
PA3_16	Public services satisfaction	00-10
PC2_1	In the past week, how often have you expressed yourself via Facebook?	Never Rarely Sometimes Often Very often
PC2_2	Last week, how often did you express yourself or communicate via Twitter?	Never Rarely Sometimes Often Very often
PC2_3	Last week, how often did you express yourself or communicate via Instagram?	Never Rarely Sometimes Often Very often
PC2_4	Last week, how often did you express yourself or communicate via WhatsApp or Telegram?	Never Rarely Sometimes Often Very often
PC2_5	How often do you usually have social gatherings with people who are or were your neighbors?	Never Rarely Sometimes Often Very often
PD2_1	During the last week, did you feel as if you could not shake off sadness?	Rarely or never A few or sometimes A considerable number of times All the time or most of the time
PD2_2	During the last week, did you find it difficult to concentrate on what you were doing?	Rarely or never A few or sometimes A considerable number of times All the time or most of the time
PD2_3	During the last week, did you feel depressed?	Rarely or never A few or sometimes A considerable number of times All the time or most of the time
PD3_1	During the last two weeks, how often have you felt discomfort from feeling nervous, uneasy, or on edge	None days More than half of the days Almost every day
PF12_4	Currently, are you worried that someone living with you will have problems because of spending too much time on social networks?	Yes No

3.5. Regression analysis

We constructed a regression model with happiness as the dependent variable and factors identified from EFA and CFA as independent variables. The process involved the following steps: a) We assessed the correlation strength and variance explained by the model using R-value and R Square. b) We evaluated the overall significance of the model with ANOVA. c) We determined the impact of each independent variable on happiness using the Coefficients Analysis.

3.5.1. Path Analysis

We evaluated the model using indices like SRMR, NFI, and Chi-Square for a Model Fit assessment. We used structural equation modeling to conduct path analysis to examine the direct effects of the independent variables on happiness perception.

3.6. Hypothesis Testing

We used the appropriate statistical tests to examine the following hypotheses:

- H1: Social networks impact citizens' happiness positively.
- H2: Psychological factors impact citizens' happiness negatively.
- H3: Socioeconomic factors affect citizens' happiness positively.

3.7. Interpretation of Results

We examined the results of EFA and CFA in the context of existing research and theories. We analyzed the findings and drew connections between them and the literature review.

3.8. Conclusion and Policy Implications

We outlined conclusions based on the analysis and hypotheses testing. We suggested practical applications for government policies to enhance citizens' quality of life in Mexico.

4. Results

4.1. Descriptive Analysis

The 2021 ENBIARE survey analyzed data to gain insights into the subjective well-being and happiness of Mexican citizens. The study found that the mean happiness score was 8.45, with a median of 9, indicating that a significant majority (65%) of citizens reported high levels of life satisfaction, mostly falling within the range of 8 to 10 on the happiness scale.

We found that Facebook is less popular in Mexico, with only 27.3% of the population reporting frequent use, while 52.8% either rarely use it or not at all. On the other hand, WhatsApp and Telegram are highly favored, with 57.5% of the population using them for cellphone messaging. However, newer platforms like TikTok, a Chinese social media platform, have limited adoption, with 89% of citizens reporting never using it. Similarly, Twitter and Instagram are infrequently used, with 90.3% and 82.8% of the population abstaining from their use.

The survey revealed some important findings regarding mental health. About 13.3% of the participants reported feeling sad more than half of the time, while 22.2% experienced it occasionally, and 64.6% didn't report such symptoms. Depression symptoms were observed in 37.6% of the population, with 5.2% experiencing constant depression. When it comes to stress, 56% of the participants didn't report experiencing it, while 13.7% felt it often or very often. Anxiety symptoms were reported by 41.8% of the

Table 2. KMO and Bartlett’s test EFA.

KMO Sampling Adequacy		.804
Bartlett’s Test of Sphericity	Approx Chi2	110847.9
	Df	136
	Sig.	.000

Note: self-elaboration using SPSS.

Table 3. Low Communalities EFA.

Communalities	Initial	Extraction
Family Satisfaction	1.000	0.385
Home Satisfaction	1.000	0.386
Network addiction worries	1.000	0.291

Extraction Method: Principal Component Analysis.

Note: Self-elaboration using SPSS.

population, with 16.8% experiencing them often or very often. Additionally, 21.5% of the participants expressed concerns about family members spending excessive time on social media.

We found that 73.8% of the participants expressed high or very high levels of satisfaction with their economic situation. In terms of health, 76% of the citizens reported very high satisfaction levels, with a score of 8 or higher. When it came to social life, 76.1% of the population conveyed high satisfaction levels, with scores exceeding 7. Family relations also seemed to be a source of contentment, as 89.9% of respondents expressed high satisfaction levels, scoring eight or higher.

However, safety perception emerged as a notable concern, with only 46.6% of respondents reporting scores of 8 or higher, and 36.6% falling between the range of 5 to 7. On the other hand, residents of Mexico overwhelmingly expressed high satisfaction with their homes, with 78.5% scoring eight or higher.

Public services, on the other hand, emerged as an area that needs improvement, with only 46.5% providing high scores, while 38.9% expressed moderate satisfaction.

4.2. Exploratory factor analysis

A principal component analysis with an orthogonal varimax rotation was performed using SPSS to conduct an exploratory factor analysis. In Table 2, you can find the Kaiser-Meyer-Olkin (KMO) and Bartlett’s sphericity values. The KMO value of 0.804 indicates that the sample size is adequate for this method. The Bartlett value of $X^2 (n = 27475) 110847 = p (0.000)$ is statistically significant and shows that the data is correlated.

The SPSS table on total variance indicates that there are four factors that explain a total of 52.343% of the variance. According to the scree plot, there are only four factors with an eigenvalue greater than 1, which were selected for further analysis. The communalities table (Table 3) shows the proportion of each variable’s variance that can be explained by the factors. The extracted values represent the variance of these four retained factors. However, the communalities’ threshold was set at 0.40, and as such, these values are not high enough to be considered for further analysis.

Table 4. KMO & Bartlett CFA.

KMO Sampling Adequacy		0.770
Bartlett's Test of Sphericity	Approx. Chi2	90963.11
	Df	78
	Sig.	.000

Note: Self-elaboration using SPSS.

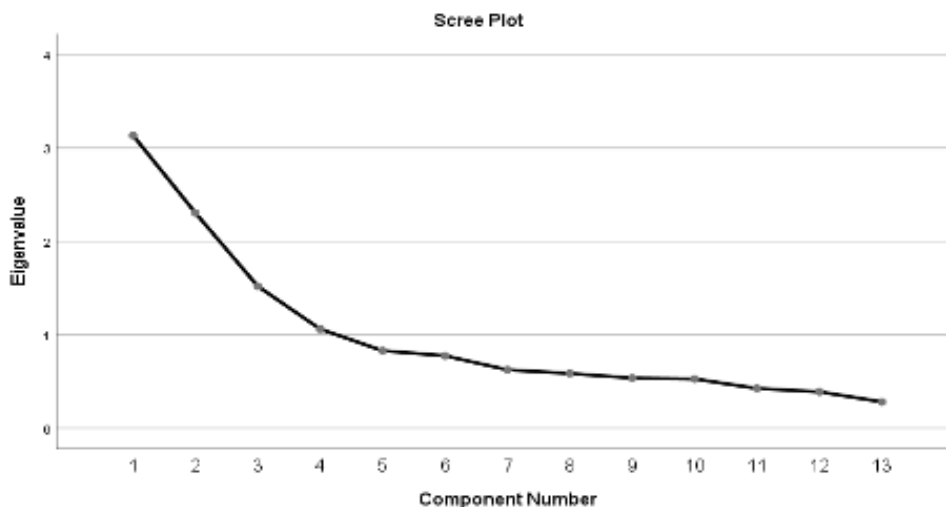


Figure 1. Scree plot CFA. Self-elaboration using SPSS.

4.3. Confirmatory factor analysis

Factor analysis was repeated twice after social life satisfaction dropped below a certain threshold. According to Table 4, the final KMO value was 0.770, indicating that factor analysis could still be used. The four factors in the CFA accounted for a total variance of 61.7%, which was the final result.

The scree plot in Figure 1 shows four factors, indicating that the discarded variants had little impact.

The component matrix for the CFA (Table 5) displays each variable's contributions to the factors and is sorted by weight.

A rotation was performed on the principal component analysis to enhance the model's accuracy. The findings are shown in Table 6. We analyzed the rotated components matrix to determine the final contributions of each variable to the factors. The majority of psychological factors were grouped into a single factor, while the socioeconomic variables were placed in another. Interestingly, social networks were divided into two factors based on low and high usage.

The factors were named based on the content of the variables in the following order: (Factor 1) Psychological Factors, (Factor 2) Socioeconomic Factors, (Factor 3) Low use of social networks, and (Factor 4) High use of social networks.

Table 5. CFA Component Matrix.

Variable	Component 1	Component 2	Component 3	Component 4
Depression symptom 2	0.795	0.255	0.255	-0.044
Depression symptom 1	0.782	0.238	0.274	-0.046
Stress symptom 1	0.723	0.317	0.249	0.059
Anxiety symptom 1	0.670	0.281	0.312	-0.063
Health Satisfaction	-0.567	0.198	-0.329	0.196
Economy Satisfaction	-0.509	0.227	-0.417	-0.156
Facebook usage Satisfaction	-0.207	0.687	-0.156	-0.395
Instagram usage Satisfaction	-0.145	0.681	-0.169	-0.324
WhatsApp & Telegram usage	-0.253	0.620	-0.163	-0.524
TikTok usage	-0.079	0.558	-0.117	-0.310
Twitter usage Satisfaction	-0.109	0.539	0.321	-0.517
Safety Satisfaction	-0.316	0.059	0.664	-0.161
Public services Satisfaction	-0.306	0.099	0.641	0.152

Extraction Method: Principal Component Analysis.

Note: 4 Extracted components.

Table 6. Rotated Component Matrix.

Variable	Component 1	Component 2	Component 3	Component 4
Depression symptom 2	0.870	-0.081	0.001	-0.045
Depression symptom 1	0.859	-0.061	-0.015	-0.054
Stress symptom 1	0.827	-0.044	0.056	-0.048
Anxiety symptom 1	0.712	-0.138	0.091	-0.018
Safety Satisfaction	-0.025	0.751	0.051	-0.142
Public services Satisfaction	-0.007	0.727	-0.074	-0.206
Economy Satisfaction	-0.185	0.637	0.004	0.303
Health Satisfaction	-0.284	0.548	-0.015	-0.316
Twitter usage Satisfaction	-0.023	0.010	0.778	0.009
Instagram usage Satisfaction	0.005	0.029	0.777	-0.222
TikTok usage	0.053	0.047	0.632	-0.154
WhatsApp & Telegram usage	-0.026	0.016	0.146	0.853
Facebook usage Satisfaction	0.028	0.024	0.272	0.787

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 5 iterations.

4.4. Regression analysis

In Table 7, the model summary reveals vital statistics for interpreting the relationship between the independent variables—Psychological Factors, Social Networks, and Socioeconomic Factors—and the analyzed dependent variable. The R-value stands at 0.581, denoting a moderate correlation strength, with values nearing 1 signifying a more robust correlation. The explained variance of the dependent variable by the model, as shown by the R Square, is 33.7%, suggesting that the model accounts for over a third of the variance in happiness levels, presuming happiness is the outcome measured. The Adjusted R Square also reads 0.337, mirroring the R Square, which implies that the number of variables and sample size are well suited for the model. Lastly, the Standard Error of the Estimate at 1.477 reflects the average deviation of

Table 7. Model Summary.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.581 ^a	0.337	0.337	1.477

a. Predictors: (Constant), Psychological_Factors, Social_Networks, and Socio-Economical_Factors.

Table 8. ANOVA^a.

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	34586.510	3	11528.837	5286.850	.000 ^b
Residual	67953.809	31162	2.181		
Total	102540.319	31165			

a. Dependent Variable: Happiness_Perception.

b. Predictors: (Constant), Psychological_Factors, Social_Networks, and Socio-Economical_Factors.

the observed values from the model’s predicted values, with lower figures indicating a tighter model fit to the data.

In Table 8 ANOVA of the regression model provides insights into the data’s variability and checks whether the predictor variables significantly influence the outcome. The Sum of Squares shows how much variance the model explains (34,586.51) versus the unexplained variance (67,953.809). The model’s degrees of freedom are three, matching the number of independent variables, and the residuals’ degrees of freedom are 31,162, found by deducting the number of model parameters from the observations count. The Mean Square is the variance explained by each predictor (11,528.837 for regression) and the average variance unexplained by the model (2.181 for residuals). The F-statistic is 5,286.850, calculated by dividing the regression mean square by the residual mean square, indicating the model’s overall significance; a high value means the model is likely significant. The significance level (Sig) is .000, suggesting the predictors—Psychological Factors, Social Networks, and Socioeconomic Factors—significantly influence happiness perception. Thus, the model is effective in accounting for happiness perception variability.

Table 9 shows the regression analysis and reveals the influence of independent variables on happiness perception. The constant’s coefficient at 3.004, with a significant t-value, suggests its importance in the model. Socioeconomic factors, with a coefficient of 0.693 and a high Beta of 0.500, imply a substantial positive effect on happiness for each unit increase. Similarly, social networks, with a lower coefficient of 0.110 and a Beta of 0.045, also positively affect happiness, though to a lesser extent than socioeconomic factors. Conversely, psychological factors have a negative impact, as indicated by a coefficient of -0.430 and a Beta of -0.167, meaning an increase in these factors corresponds to a decrease in happiness. All effects are statistically significant, with socioeconomic factors being the most influential in the model. The table shows that both socioeconomic factors and social networks significantly positively impact the perception of happiness, while psychological factors have a significant negative impact. Socioeconomic factors appear to have the most substantial impact on the perception of happiness, according to the model.

4.4.1. Path Analysis

In Figure 2, path analysis using the given data reveals how Psychological Factors, Social Networks, and Socioeconomic Factors directly affect Happiness Perception. Psychological Factors negatively influence happiness (-0.138), suggesting more psychological issues may lead to less perceived happiness. Social Networks have a minimal positive impact (0.023) on happiness, indicating that increased engagement might

Table 9. Coefficients^a. The regression analysis reveals the influence of independent variables on happiness perception.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	3.004	0.058		52.170	0.000
Socio-Economical_Factors	0.693	0.007	0.500	102.024	0.000
Social_Networks	0.110	0.011	0.045	9.622	0.000
Psychological_Factors	-0.430	0.012	-0.167	-34.476	0.000

a. Dependent Variable: Happiness_Perception.

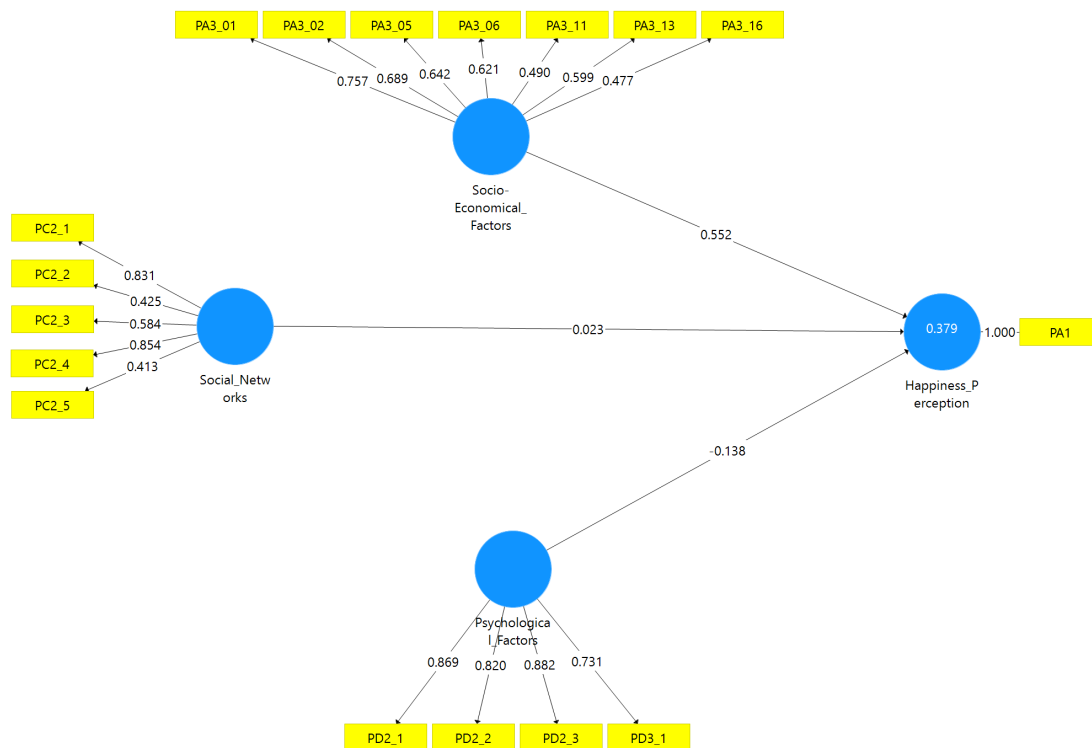


Figure 2. Performing a path analysis to identify the factors that influence an individual’s perception of happiness. Self-elaboration using SPSS.

be marginally related to higher happiness levels. Socioeconomic factors demonstrate a robust positive effect (0.552), meaning better socioeconomic conditions are likely associated with more excellent happiness perception. The analysis focuses on direct effects and presumes linear relationships without proving causation; experimental studies would be required to establish causative links.

Table 10 describes the indices for assessing a structural equation model’s accuracy. Saturated and Estimated Models return the same fit index. The SRMR value at 0.068 signals a good model fit. The d_ ULS and d_ G indices also suggest a decent fit, though without established benchmarks for these indices, their identical values in both models raise questions about the accuracy of the estimation or reporting process. The high Chi-Square value suggests acquiring more indices to compare fitness. The NFI stands at 0.803, indicating a reasonable model fit.

Table 10. Model fit. The indices for assessing a structural equation model's accuracy.

Measure	Saturated Model	Estimated Model
SRMR	0.068	0.068
d_ULS	0.705	0.705
d_G	0.151	0.151
Chi-Square	27,951.39	27,951.39
NFI	0.803	0.803

4.4.2. Hypotheses results

Based on the information provided in the previous section, the hypotheses posed at the beginning of this paper can be confirmed:

H1: Social networks impact citizens' happiness positively.

Table 9 shows a positive coefficient for social networks (Social_Networks) with a B value of 0.110 and statistical significance ($p < .000$), confirming that there is a positive impact of social networks on citizens' happiness.

H2: Psychological factors impact citizens' happiness negatively.

Psychological factors (Psychological_Factors) have a negative coefficient ($B = -0.430$) with statistical significance ($p < .000$), confirming that psychological factors have a negative impact on citizens' happiness.

H3: Socio-economic factors affect citizens' happiness positively.

Socioeconomic factors (Socio-Economical_Factors) have a positive coefficient ($B = 0.693$) and statistical significance ($p < .000$), indicating that socioeconomic factors have a positive effect on citizens' happiness.

4.5. Discussion

The role of psychological factors in determining individual well-being needs to be observed and evaluated, often using a more profound influence than socioeconomic variables and the scope of each social network. This approach is related to the inherent nature of happiness, which is significantly influenced by people's mental and emotional state and belongs to mental health professionals' view. Negative well-being is a topic position that emphasizes the lack of happiness; it's tied to psychological conditions that have more influence from internal cognitive and emotional processes than external factors.

In examining the relationship between socioeconomic factors and happiness, it becomes evident that the former holds a tangible impact due to the direct effect on living conditions. Essential aspects such as citizens' satisfaction with healthcare, public safety, and the quality of public services are instrumental in shaping their perceived well-being. These elements of societal infrastructure create an environment that enables individuals to lead satisfying lives, thus contributing to an overall sense of happiness.

The consistency in the SRMR value across both models indeed underlines the robustness of the model fit. This concept is supported by several research studies, and found that SRMR is robust to the method used to estimate the model parameters, suggesting that the same criterion can be applied at the population level when using the SRMR to evaluate model fit, regardless of the choice of estimation method [25]. Another finding is that SRMR performed well and consistently selected the correct number of factors, even when other fit indices were overly sensitive to correlated residuals and nonspecific error [26]. And despite the identical d-ULS and d-G values, the overall model fit indices support the model's reliability" is supported by research findings. The number of categories and threshold values do not impact the unscaled fit indices in the population, which indicates that the overall model fit indices such as RMSEA, CFI, and TLI support the reliability of the model even when using different estimation methods and similar values [27].

The high values of Chi-Square although concerning, emphasizes the importance of incorporating additional indices for a comprehensive evaluation of model fitness [28]. Nevertheless, even if indices such as the Comparative Fit Index (CFI) and others are used, the chi-square test can be sensitive to sample size and model specifications. They advocate for the use of the root mean square error of approximation (RMSEA) and the standardized root mean square residual (SRMR), to provide a more comprehensive assessment of model fit [29], but on the other hand we decide to use SRMR as it is considered relatively equal in sensitive data as RMSEA [30].

In this paper, we find that satisfaction derived from social life, home, and family, while intuitively significant, did not emerge as statistically meaningful in predicting happiness. This suggests a potential acclimatization effect where individuals become habituated to their living environments and social relations. Consequently, the variability in happiness attributed to these factors may be more nuanced, contingent on individual expectations and experiences rather than a uniform effect across a population. Furthermore, the study's findings on the influence of housing, public services, and healthcare on happiness reaffirm the role of governmental policies and institutions in fostering a conducive environment for citizens' well-being. Mexico's initiatives in these domains exemplify the government's role in prioritizing the happiness of its citizens through structured support and services.

The expected uniform contribution of social networks to happiness was also put to the test. Under this approach, citizens embraced not all networks equally, prompting a bifurcation into two distinct categories. Platforms like Facebook and WhatsApp, which enjoy widespread usage among Mexican citizens, formed a separate category, underscoring the importance of these networks in facilitating communication, self-expression, and maintaining relationships with friends and family. These networks' popularity may also reflect cultural preferences and the importance of close-knit community ties in the region. In contrast, lesser-used social networks still demonstrated a correlation with happiness, albeit for possibly different reasons. They may serve as indicators of individuals seeking niche communities or more intimate communication channels, which can also contribute to a sense of well-being. The overarching theme is that while the medium of social interaction may vary, the quality and satisfaction derived from these interactions play a pivotal role in an individual's happiness.

These findings collectively advance our understanding of the intricate web of factors influencing happiness. They underscore the necessity of a multi-faceted approach in analyzing well-being, which appreciates the complex interplay between psychological well-being, socioeconomic conditions, and the varied dimensions of social connectivity.

5. Conclusions

The acceptance of the hypothesis that social networks positively impact citizens' happiness underscores the role of digital interconnectedness in modern well-being. This finding suggests that social media platforms can serve as a supportive community for individuals, offering a sense of belonging and an avenue for positive social interaction. However, it is crucial to foster digital literacy and awareness to mitigate the risks of overuse, which can lead to addictive behaviors and adverse mental health outcomes. Future policies could promote healthy social media habits and encourage platforms to create features that contribute to users' well-being.

The confirmation that psychological factors negatively impact happiness highlights the complex interplay between mental health and overall life satisfaction. This suggests that mental health issues could be significant obstacles to achieving a state of happiness. It's important to advocate for the attention of mental health problems and to increase accessibility to mental health services. Policymakers should consider integrating mental health education into the curriculum in training programs and providing resources for early detection and intervention.

The positive effect of socioeconomic factors on happiness indicates the importance of a stable and nurturing environment in cultivating well-being. Factors such as access to quality healthcare, economic stability, and social support systems are foundational to citizens' happiness. This result supports comprehensive social policies to address inequalities and meet basic needs. Governments could consider investing in community development programs, public health initiatives, and social safety nets that are responsive to the needs of their citizens.

The study's findings reinforce that happiness is a complex topic and can be significantly influenced by external conditions. Governments and organizations should adopt a holistic approach that considers psychological health, social connectedness, and socioeconomic stability to design effective well-being policies.

Future research should aim to compare these findings across different cultural, social, and industrial contexts and levels of economic development to deepen the understanding of these complex relationships. Longitudinal studies could also provide insights into these factors' causality and long-term effects on happiness. Additionally, qualitative research might uncover the subjective experiences behind the statistical associations, giving voice to the personal narratives of happiness and well-being.

5.1. Implications

This study shows evidence of the substantial impact of socioeconomic factors on the happiness of Mexican citizens, emphasizing the need for public policies that enhance economic stability, healthcare access, and public safety. By addressing these core areas, the government has the opportunity to create conditions that lead to higher life satisfaction and well-being among citizens. Moreover, the positive role of social networks in happiness indicates that promoting digital literacy and encouraging balanced online activity can strengthen community ties and support.

Additionally, the negative effects of psychological factors (anxiety and depression) on happiness highlight the critical need for mental health initiatives. Policymakers should focus on mental health services, incorporating early intervention strategies and improving access to psychological support. By addressing both external socioeconomic conditions and internal psychological well-being, a comprehensive approach can be developed to significantly improve the population's quality of life, fostering a more resilient society.

5.2. Future work

It is our finding that future research should explore the cultural, social, and economic contexts that influence happiness across different populations, regions and countries. Comparative studies between several regions in Mexico and other countries can shed light on how different factors interact to impact well-being depending on the mentioned factors. Longitudinal studies are an opportunity to understand the long-term effects of socioeconomic changes and mental health interventions on happiness, for this, the evidence from statistical national institutes motivated by a care-giving policy is necessary. Additionally, qualitative methods like interviews and focus groups can reveal personal stories and subjective experiences that quantitative data might miss.

Another vital area for future research is examining the digital divide and its effects on happiness. Studying how digital technology access and usage differ among socioeconomic groups can provide valuable insights into the importance of digital literacy for well-being. Moreover, developing and assessing targeted mental health and digital literacy programs can help identify effective strategies to enhance happiness in specific communities. This comprehensive approach will deepen our understanding of happiness determinants and inform policies to improve quality of life.

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References

- [1] Gabriela Delsignore, Alejandra Aguilar-Latorre, and Bárbara Oliván-Blázquez. Measuring happiness in the social sciences: An overview. *Journal of Sociology*, 57:1044–1067, 12 2021.
- [2] Chris Biggadike, Eduardo Ahumada-Tello, Richard Evans, and Mark Wehde. Cultural hierarchies, leadership, and employee happiness. *IEEE Engineering Management Review*, 51:8–12, 9 2023.
- [3] INEGI. Encuesta nacional de bienestar autorreportado (enbiare) 2021, 2021.
- [4] Yukina Yumen, Yumi Takayama, Fumiaki Hanzawa, Naoki Sakane, and Narumi Nagai. Association of social networking sites use with actual and ideal body shapes, and eating behaviors in healthy young japanese women. *Nutrients*, 15:1589, 3 2023.
- [5] Sarah M. Coyne, Brandon T. McDaniel, and Laura A. Stockdale. “do you dare to compare?” associations between maternal social comparisons on social networking sites and parenting, mental health, and romantic relationship outcomes. *Computers in Human Behavior*, 70:335–340, 5 2017.
- [6] Samuel Ginja, Jane Coad, Elizabeth Bailey, Sally Kendall, Trudy Goodenough, Samantha Nightingale, Jane Smiddy, Crispin Day, Toity Deave, and Raghu Lingam. Associations between social support, mental wellbeing, self-efficacy and technology use in first-time antenatal women: data from the babbles cohort study. *BMC Pregnancy and Childbirth*, 18:441, 12 2018.
- [7] Yean Wang, Huan Zhang, Tong Feng, and Hongyang Wang. Does internet use affect levels of depression among older adults in china? a propensity score matching approach. *BMC Public Health*, 19:1474, 12 2019.
- [8] Julia Brailovskaia and Jürgen Margraf. Comparing facebook users and facebook non-users: Relationship between personality traits and mental health variables – an exploratory study. *PLOS ONE*, 11:e0166999, 12 2016.
- [9] Ying Chieh Liu, Hung Yi Chen, and Bo Yen Yao. Exploring subjective well-being in social network sites? - supplementary fit and social support perspective. *MATEC Web of Conferences*, 71:03005, 8 2016.
- [10] Efstratia Arampatzi, Martijn J. Burger, and Natallia Novik. Social network sites, individual social capital and happiness. *Journal of Happiness Studies*, 19:99–122, 1 2018.
- [11] Borae Jin. How lonely people use and perceive facebook. *Computers in Human Behavior*, 29:2463–2470, 11 2013.
- [12] Yang Yu-ting, Yao Miao, Yang Yong-wei, Ye Qiong, and Lin Ting. Relationships between children-related factors, basic psychological need satisfaction, and multiple happiness among urban empty-nesters in china: a structural equation modeling. *BMC Geriatrics*, 22:925, 12 2022.

- [13] Hanem Ahmed Abd El Khalek Ahmed and Bothina Elsayed Said Mohamed. Relationship between morality, happiness, and social support among elderly people. *Middle East Current Psychiatry*, 29:31, 12 2022.
- [14] Micael Dahlen and Helge Thorbjørnsen. Individuals' assessments of their own wellbeing, subjective welfare, and good life: Four exploratory studies. *International Journal of Environmental Research and Public Health*, 19:11919, 9 2022.
- [15] Vandepitte Sophie, Claes Sara, T'Jaeckx Jellen, and Annemans Lieven. The role of 'peace of mind' and 'meaningfulness' as psychological concepts in explaining subjective well-being. *Journal of Happiness Studies*, 23:3331–3346, 10 2022.
- [16] Bruce W. Smith, Naila deCruz Dixon, Kelly Erickson, Anne Guzman, Alvin Phan, and Kaitlyn Schodt. The effects of an online positive psychology course on happiness, health, and well-being. *Journal of Happiness Studies*, 24:1145–1167, 3 2023.
- [17] G. Ramshaw, A. McKeown, R. Lee, A. Conlon, D. Brown, and P. J. Kennedy. Introduction of technology to support young people's care and mental health—a rapid evidence review. *Child & Youth Care Forum*, 52:509–531, 6 2023.
- [18] Noura Abdulla Almadani and Mai B. Alwesmi. The relationship between happiness and mental health among saudi women. *Brain Sciences*, 13:526, 3 2023.
- [19] Eduardo Ahumada-Tello and Karen Ramos. Reality or utopia? the happiness of university academics in their professional performance: evidence from an emerging country (mexico). *Management Decision*, 6 2023.
- [20] Kai Li, Feng Yu, Yanchi Zhang, and Yongyu Guo. The effects of subjective social class on subjective well-being and mental health: A moderated mediation model. *International Journal of Environmental Research and Public Health*, 20:4200, 2 2023.
- [21] Jose Roberto Balmori de la Miyar. Breaking sad: drug-related homicides and mental well-being in mexico. *International Review of Economics*, 67 4:513–531, 12 2020.
- [22] Jie Yang. “fake happiness”: Counseling, potentiality, and psycho-politics in china. *Ethos*, 41 3:292–312, 9 2013.
- [23] Weiwei Wang, Yan Sun, Yong Chen, Ya Bu, and Gen Li. Health effects of happiness in china. *International Journal of Environmental Research and Public Health*, 19 11:6686, 5 2022.
- [24] Yun Su and Azizan Sabjan Muhammad. Role of economic, and social parameters affecting life satisfaction and happiness during pre and post covid era: a study with marx's perspective. *Economic Research-Ekonomika Istraživanja*, 36 12, 12 2023.
- [25] D. Shi and A. Maydeu-Olivares. The effect of estimation methods on sem fit indices. *Educational and Psychological Measurement*, 80 3:421–445, 2020.
- [26] A. Montoya and M. C. Edwards. The poor fit of model fit for selecting number of factors in exploratory factor analysis for scale evaluation. *Educational and Psychological Measurement*, 81 3:413–440, 2021.
- [27] Yan Xia and Yanyun Yang. The influence of number of categories and threshold values on fit indices in structural equation modeling with ordered categorical data. *Multivariate Behavioral Research*, 53 5:731–755, 2018.
- [28] P. Bentler. Comparative fit indexes in structural models. *Psychological Bulletin*, 107:238–246, 1990.
- [29] Moritz Heene, Sven Hilbert, Clemens Draxler, Matthias Ziegler, and Markus Bühner. Masking misfit in confirmatory factor analysis by increasing unique variances: a cautionary note on the usefulness of cutoff values of fit indices. *Psychological methods*, 16 3:319–36, 2011.
- [30] P. Barrett. Personality and individual differences. *Multivariate Behavioral Research*, 42 5:815–824, 2007.