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Investigating the Relationship between Developer Job Satisfaction and Life Satisfaction: A Global Analysis

Alan Peslak
arp14@psu.edu
Department of Information Sciences and Technology
Penn State University
Dunmore, PA 18512 USA

Wendy Ceccucci
wendy.ceccucci@qu.edu

Kiku Jones
kiku.jones@qu.edu

Business Analytics and Information Systems Department
Quinnipiac University
Hamden, CT 06518 USA

Lori N. K. Leonard
lori-leonard@utulsa.edu
Department of Accounting and Business Information Systems
The University of Tulsa
Tulsa, OK 74104

Abstract

This paper explores the association between developer job satisfaction and life satisfaction on a global scale. With the increasing prominence of the software development industry and its impact on individuals' professional and personal lives, understanding the connection between job satisfaction and overall life satisfaction becomes crucial. We present a comprehensive analysis based on data collected from diverse regions and cultures, aiming to determine the magnitude of the correlation between these two constructs.

Through a systematic review of existing literature, surveys, and empirical studies, we compile a robust dataset encompassing responses from developers across different countries and career stages. To assess job satisfaction, we used a worldwide survey from StackOverflow. Life satisfaction is evaluated from the World Values Survey, the Human Development Index, and the World Happiness Report. We grouped the world into logical geographic regions to discover key insights.

Our findings reveal a modest correlation between developer job satisfaction and life satisfaction worldwide. Despite the significant impact of job satisfaction on one's professional life, the influence on overall life satisfaction appears to be more nuanced. While several studies have reported positive associations between the two constructs, our analysis suggests that the correlation is relatively weak, indicating that job satisfaction alone cannot fully predict an individual's level of life satisfaction.

Keywords: developer job satisfaction, life satisfaction, global analysis, correlation, well-being, holistic approach

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Investigating the Relationship between Developer Job Satisfaction and Life Satisfaction: A Global Analysis

Alan Peslak, Wendy Ceccucci, Kiku Jones and Lori N. K. Leonard

1. INTRODUCTION

The importance of determining variables that affect job satisfaction is an important element in determining how job satisfaction can be improved. Improving job satisfaction has many benefits for both individual workers, organizations that employ these workers and the economy of a nation overall (Faragher, Cass, & Cooper, 2005; Augner, 2015; Arnold, Coffeng, Boot, Van Der Beek, Van Tulder, Nieboer, Van Dongen, 2016). Life satisfaction and job satisfaction are interrelated constructs that play a pivotal role in individuals' mental health and overall quality of life (Diener, Oishi, & Tay, 2018). Life satisfaction, the cognitive-judgmental aspect of subjective well-being (Diener, 1984), is significantly influenced by various factors, including employment and job satisfaction (Clark, Oswald, & Warr, 1996). The latter, job satisfaction, is a multidimensional psychological response to one's job, which may include cognitive (evaluative), affective (or emotional), and behavioral components (Spector, 1997).

Understanding the relationship between these two aspects and the factors that influence them can provide valuable insights into the shaping of policies and strategies aimed at improving the overall quality of life for individuals worldwide. Although previous research has explored these aspects separately or within specific cultures or nations (Judge, Thoresen, Bono, & Patton, 2001; Helliwell & Huang, 2014), a comprehensive global analysis is still lacking. This is particularly relevant in the face of globalization and the current era of digital transformation, where work conditions and life satisfaction factors are rapidly changing (Brynjolfsson & McAfee, 2014).

This research paper aims to fill this gap by providing a comprehensive examination of worldwide life satisfaction and job satisfaction. We synthesize data from various international databases, such as the World Happiness Report (Helliwell, Layard, Sachs, De Neve, Akinin, & Wang, 2022), the Human Development Index (United Nations, 2023), and the World Values Survey (Inglehart, Haerpfer, Moreno, Welzel, Kizilova, Diez-Medrano, Lagos, Norris, Ponarin, &

Puranen, 2020) to provide an overarching understanding of these constructs across different cultures, economies, and labor markets. By integrating these diverse data sources, we aim to generate an inclusive, nuanced, and up-to-date understanding of life and job satisfaction on a global scale.

2. LITERATURE REVIEW

Job Satisfaction

Organizational behaviorists and organizational psychologists have long studied the subject of employees' job satisfaction. The literature includes several facets of what variables make up job satisfaction. According to Lumley, Coetzee, Tladinyane & Ferreira (2011), job satisfaction can be defined as "an individual's total feeling about their job and the attitudes they have towards various aspects or facets of their job, as well as an attitude and perception that could consequently influence the degree of fit between the individual and the organization" (pg. 101). Employee satisfaction is "determined by subjective perceptions related to the treatment received by the organization, for instance, policies of rewards, hiring and firing policies, performance and retribution." (Crespi-Vallbona & Mascarilla-Miro, 2018, pg. 36). Sempane, Rieger & Roodt (2002), assert that job satisfaction is made up of many variables such as "structure, size, pay, working conditions and leadership", all representatives of organizational climate (pg. 23). Some of these variables may also include the "importance of job position, teamwork atmosphere, leadership, recognition and compensation, physical labor conditions and personal labor conditions as key aspects of employees' well-being." (Crespi-Vallbona, et al., pg. 37). In a study done by LeRouge, Wiley, & Maertz (2013), the authors included job security, the work itself, one's supervisor, compensation, work/life balance, and advancement/opportunities as important facets of job satisfaction.

According to an article written by David Engle (2020) and published by CompTIA, 72% of global IT professionals are satisfied with their job. One of main reasons for employee's satisfaction was professional development.

Globally, 81% of IT staff listed "build new skills" as their top reason for development.

A study completed across four countries, Austria, Germany, Slovenia, and Spain, found that differences in employee job satisfaction between IT and other sectors were not statistically significant (Cic, Bobek, & Zizek, 2018)

Life Satisfaction

Life satisfaction measures how people evaluate their life as a whole rather than their current feelings. Daniel Kahneman, Nobel Prize winner, described happiness as being happy in your life and the experience in real time. He described life satisfaction as being retrospective. It is the happiness about your life. It is the happiness that exists when one talks about the past and the big picture. Life satisfaction is the way in which people show their emotions, feelings and how they feel about their directions and options for the future (Kahneman, 2010).

Several research papers have extensively reviewed the literature on job and life satisfaction (Tait, Padgett, & Baldwin, 1989; Rain, Lane, & Steiner, 1991; Unanue, Gomez, Cortez, Oyandedel & Mediburo-Sequel, 2017; Riche, Near, & Hunt, 1980). The summary below uses the results of some of this extensive literature review.

According to the literature, there are three main tracks of thought regarding the correlational relationship between job satisfaction and life satisfaction: segmentation, compensation and spillover.

The segmentation theory suggests that there is no relationship between job and life satisfaction. Theoretical positions such as partial inclusion have been proposed to explain the link between both concepts from this perspective.

The compensation theory holds that people compensate for their job dissatisfaction by finding more satisfaction in other areas of their life, and vice versa (Iris & Barrett, 1972). This implies that there is a negative relationship between the two constructs.

The majority of previous research has supported the spillover theory (Rain et al., 1991). The spillover theory argues that there is a positive relationship between job satisfaction and life satisfaction. The relationship is based on the generalization of belief and attitudes, conditioning, and cognitive dissonance. Previous

research has demonstrated that some type of reciprocal relationship exists between job and life satisfaction (Tait, 1989 ; Rain et al., 1991).

To measure life satisfaction our study uses the results of a question from the World Values Survey (WVS). WVS is an international research project developed by Professor Inglehart and his researchers from the University of Michigan. The survey is conducted globally every 5 years. The purpose of the research is to analyze people's values, beliefs, and norms over time.

Happiness

Happiness measures a person's well-being and contentment. Several studies have explored happiness. Weaver (1978) examines global happiness as it relates to job satisfaction. He finds very few correlations between job satisfaction and global happiness. However, he indicates that employees that are happy because of their related job satisfaction are likely to have more satisfaction in other parts of their life.

Martinez-Marti & Ruch (2017) indicate that happiness can be evaluated as a pleasant life, an engaging life, and a meaningful life. When exploring happiness's relationship with job satisfaction in Switzerland, they find an engaging life to be positively related to job satisfaction, where as a pleasant life and a meaningful life are not found to individually influence job satisfaction. However, the interaction of all three measures of happiness are a good predictor of job satisfaction.

Tsou & Liu (2001) examine happiness and job satisfaction in Taiwan. Their findings indicate that various domains can influence both factors. In particular, an individual's income affects happiness and job satisfaction. Married individuals are also found to have greater happiness and job satisfaction.

Taken from the Gallup World Poll (GWP) between 2005 and 2022, happiness is measured with the following question: "Please imagine a ladder, with steps numbered from 0 at the bottom to 10 at the top. The top of the ladder represents the best possible life for you and the bottom of the ladder represents the worst possible life for you. On which step of the ladder would you say you personally feel you stand at this time?" (World Happiness Report, 2023).

Human Development Index

The Human Development Index (HDI) is a measure of a country's average achievement in three dimensions: income, health, and education

(World Population Review, 2023). Many indicators are aggregated to determine a country's HDI. These include, but are not limited to, "life expectancy, literacy rate, rural populations' access to electricity, GDP per capita, exports and imports, homicide rate, multidimensional poverty index, income inequality, internet availability, and many more" (World Population Review, 2023).

Ngoo & Tey (2019) study life satisfaction in relation to HDI. They find that HDI attributes to variation in life satisfaction across countries. In particular, they indicate a positive correlation between HDI and life satisfaction. However, HDI alone can result in different life satisfaction across countries. Countries with similar HDI are found to have variations in life satisfaction due to variations in the dimension of well-being.

Yin, Lepinteur, Clark, & D'Ambrosio (2023) use the HDI data from 150 countries between 2005 and 2018 to examine the relationship between HDI and well-being. Looking at the three dimensions of HDI separately, they find income to be the strongest predictor of well-being. Examining all three HDI dimensions, they find that they only matter equally in "Western and rich countries".

3. METHODOLOGY

Our investigation into the remuneration and contentment of software engineers utilized data gleaned from the 2020 Stack Overflow Survey, which recorded responses from more than 65,000 individuals. The yearly Developer Survey conducted by Stack Overflow is globally recognized as the most comprehensive and extensive examination of individuals who engage in coding. Annually, the array of questions posed in their survey span various topics, from preferred technologies of developers to their favored job conditions. As stated on StackFlow's website:

"Stack Overflow's annual Developer Survey has been the biggest survey of coders worldwide for nearly a decade. For the year 2020, we aimed to make our survey more reflective of the global diversity of programmers rather than merely being the largest. Nevertheless, the survey remains substantial, with close to 65,000 participants." (StackFlow, 2020)

The use of Stack Overflow as a data source is well recognized and has been cited in various

peer-reviewed publications including those by Barua, Thomas, & Hassan (2014), Asaduzzaman Mashiyat, Roy, & Schneider (2013), and Treude & Robillard (2016). The Stack Overflow dataset provides a wealth of data, with numerous demographic, descriptive, and opinion-based questions about the current state of programming. The data was processed and scrutinized using IBM SPSS 26.

The initial step in our analysis involved refining the dataset. We eliminated data from participants who identified themselves as hobbyists as opposed to full-time developers. Out of the 65,000 participants, 47,200 identified themselves as professional developers.

4. RESULTS

We used responses from three different surveys to evaluate life satisfaction. The use of distinct datasets is well established in the literature. For example, Augner (2015) compared job satisfaction to numerous distinct data sets including healthy life years, family satisfaction, fixed term contracts, inflation rates, employment rate of women, physical activity ≥ 1 /week, etc. The reports used for this study included:

- 1) World Values' Survey (Haerpfer, Inglehart, Moreno, Welzel, Kizilova, Diez-Medrano, Lagos, Norris, Ponarin, Puranen, 2022).
- 2) the World Happiness Index (Helliwell, Layard, Sachs, De Neve, Aknin, Wang, 2022).
- 3) Human Development Index (United Nations, 2023).

We evaluated the results to determine which if any correlated with developer job satisfaction.

Job Satisfaction

The job satisfaction levels for the more than 60 countries represented in the Stackflow database are shown in Figure 1. Ranging from 2.7 to 4.0 the darker the blue the higher the satisfaction level. Andorra, Netherlands, United States, Canada, and Australia were the countries with the highest job satisfaction levels. Whereas Zimbabwe, Tunisia, China, Libya, and Morocco had the lowest job satisfaction levels.

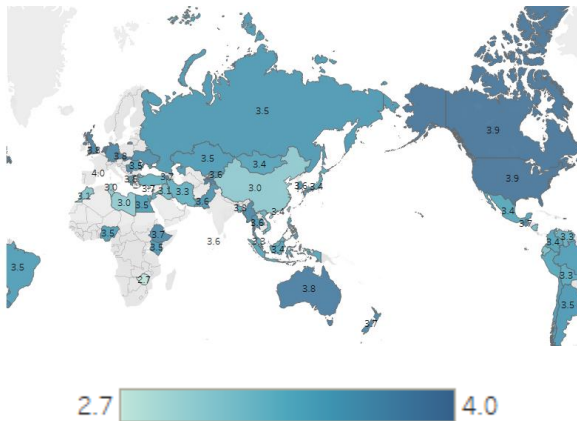


Figure 1. Job Satisfaction by Country

The next step was to divide the countries reported into world regions. We have chosen to categorize countries into the following world areas as shown in Figures 2 and 3. Primarily these subdivisions map to the World Bank Organization’s groups (World Bank, 2023). We separated Russia out due to its land mass in both Asia and Europe.

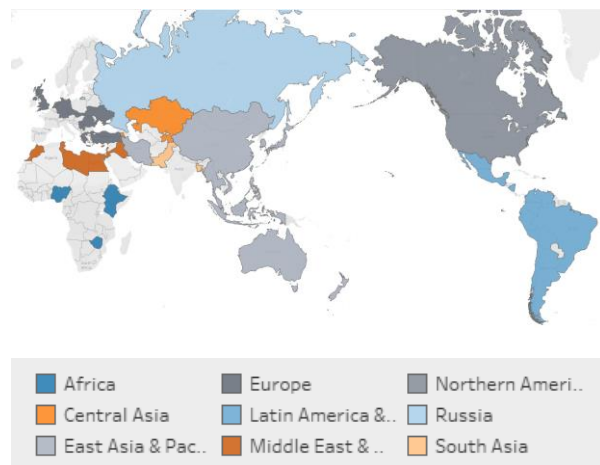


Figure 2. Countries by Geographical Areas

Figure 3 shows the overall developer job satisfaction by World Region. The highest job satisfaction was in Northern America which includes USA and Canada. The lowest developer satisfaction was in Africa, but all were above a neutral position. The differences were significant at $p < .005$.

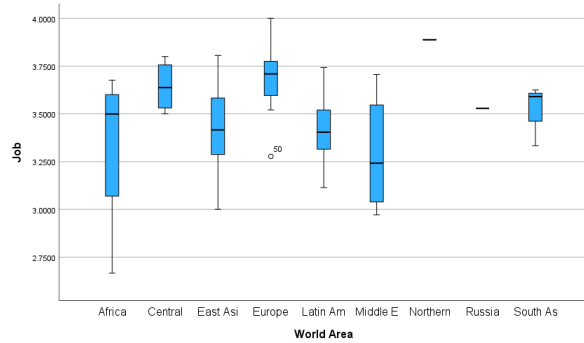


Figure 3. Job Satisfaction by Geographic Area

The economic situation in the country was then examined to see if this significantly correlated with job satisfaction. The correlation was .514 between GDP per capita and developer compensation. This suggests that 25% (R squared) of the variance may be due to the poor economy and wages within the World Region.

World Values’ Life Satisfaction

We then examined the geographic areas (GA) for overall life satisfaction based on the responses from the World Values Survey. The results taken from the survey were responses to the question, “All things considered, how satisfied are you with your life as a whole these days?” The Likert scale for the question was from 1 to 10, where 1 indicated completely dissatisfied and 10 completely satisfied.

The life satisfaction levels for these same countries were used in the analysis and are shown in Figure 4. The values ranged from 4.5 to 8.4. Andorra, Netherlands, United States, Canada, and Australia were the countries with the highest job satisfaction levels. Whereas Zimbabwe, Tunisia, China, Libya and Morocco had the lowest job satisfaction levels.

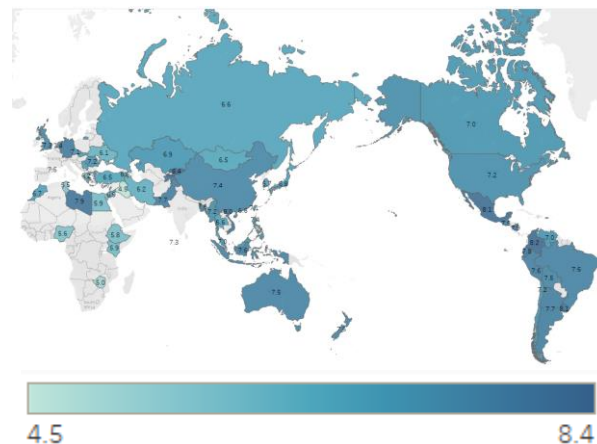


Figure 4. World Values Life Satisfaction

Results by Country

Geographical Area	Mean	N
Africa	5.56	4
Central Asia	7.47	4
East Asia & Pacific	7.07	16
Europe	6.95	11
Latin America & The Caribbean	7.69	12
Middle East & North Africa	6.33	8
Northern America	7.13	2
Russia	6.55	1
South Asia	7.52	3
Total	7.01	61

Table 1. World Values’ Life Satisfaction by Geographic Area

Table 1 shows the results of dividing the World Values’ life satisfaction levels into their respective geographical areas. The World Regions with the highest life satisfaction differed from those GAs with the highest job satisfaction. The highest life satisfaction was found in Latin America and the Caribbean, followed by South Asia and Central Asia. Africa, however, still had the lowest levels for life satisfaction. These results indicate there is a difference between job satisfaction and life satisfaction for IT developers.

The next analysis was to compare each World Region’s World Values life satisfaction response with job satisfaction. Since the scales for each were different, we normalized the data (Figure 5).

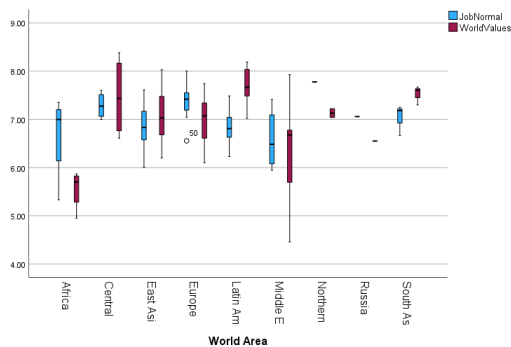


Figure 5. Job Satisfaction and World Values’ Life Satisfaction

Africa as a region did not fare well in this analysis. Both job satisfaction and life satisfaction were below the average World means. Overall life satisfaction however was much lower than job dissatisfaction.

Central Asia on the other hand, had above average job satisfaction as well as life satisfaction. Their variances were very similar. East Asia and Pacific job satisfaction was below average, but life satisfaction was above average.

Europe oddly had strong above average job satisfaction but was below the world in life satisfaction. Latin Americans and the Caribbean had the largest positive variance from world life satisfaction, but their job satisfaction was below average.

The Middle East and North Africa suffered like Africa with low job satisfaction and low life satisfaction. Northern America showed the highest job satisfaction but was only marginally above average in life satisfaction.

Russia job satisfaction was about on average but was well below average life satisfaction. Finally, South Asia was on average in job satisfaction but well above average in life satisfaction.

When we examine the correlation between job satisfaction and World Value’s life satisfaction overall, we find a significance level of only $p < .053$ and a small effect of about 12% (R squared).



Figure 6. Happiness by Country

Happiness Index

The next measure we looked at was the Happiness Index (Figure 6). The values ranged from 2.9 to 7.45. The countries that were the happiest were the same as those with the highest world values’ life satisfaction. Except, there was no data available for Andorra’s

happiness level. The least happy countries were Lebanon, Zimbabwe, Jordan, and Ethiopia.

The happiness results were then grouped by World Region and normalized to the same scale as job satisfaction. The results are shown in Figure 7 and Table 2.

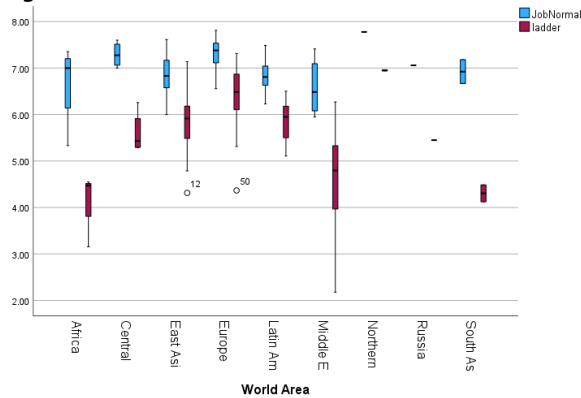


Figure 7. Happiness and Job Satisfaction

Geographical Area	Mean	N
Africa	4.16	4
Central Asia	5.60	4
East Asia & Pacific	5.87	16
Europe	6.29	10
Latin America & The Caribbean	5.86	12
Middle East & North Africa	4.58	8
Northern America	6.95	2
Russia	5.44	1
South Asia	4.30	2
Total	5.61	59

Table 2. Happiness Index by Geographic Area

Northern America had the highest happiness index values. Differences between areas were significant at $p < .001$.

Human Development Index

The last measure we examined was the Human Development Index (HDI) (Figure 8). The values ranged from 0 to 1. The countries with the highest index values were Hong Kong, Australia, Germany, Netherlands, and Singapore. The countries with the lowest Human Development Index were Taiwan, Ethiopia, Nigeria, Pakistan and Kenya,

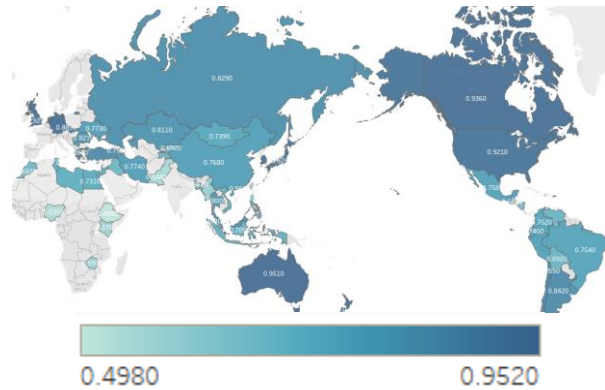


Figure 8. Human Development Index by Country

The HDI results were then grouped by World Region and normalized to the same scale as job satisfaction. The results are shown in Figure 9 and Table 3.

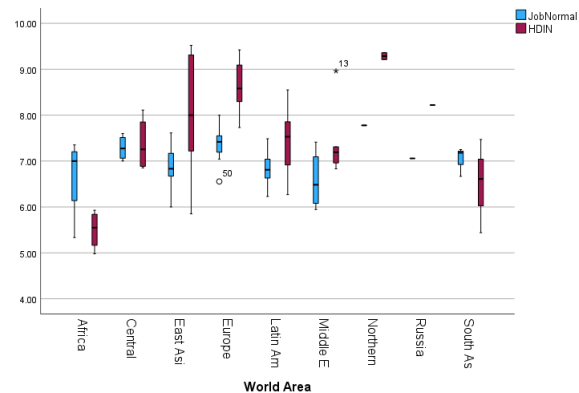


Figure 9. Human Development Index and Job Satisfaction

Geographical Area	Mean	N
Africa	0.550	4
Central Asia	0.737	4
East Asia & Pacific	0.814	15
Europe	0.866	11
Latin America & The Caribbean	0.746	12
Middle East & North Africa	0.734	8
Northern America	0.929	2
Russia	0.822	1
South Asia	0.651	3
Total	0.772	60

Table 3 HDI by Geographic Area

Developer job satisfaction and the Human Development index showed even more different results. Though Africa is consistent with job satisfaction above HDI, South Asia now shows higher job satisfaction and Europe shows much higher HDI than job satisfaction.

Overall

The results of the preceding charts are quantified in Appendix 1. We see the full differences in variances in means between job satisfaction and happiness and between job satisfaction and HDI. A World Values table was not included due to its nonsignificant correlation with developer job satisfaction.

5. CONCLUSIONS

The study highlights the importance of considering a broader range of factors beyond professional aspects when assessing life satisfaction. Individual differences, cultural influences, and personal values play significant roles in shaping overall well-being. Moreover, the complex interplay between work and personal life, as well as the varying priorities and aspirations of individuals, contributes to the intricate nature of the relationship between job satisfaction and life satisfaction.

Understanding these nuanced associations can have implications for organizations, policymakers, and individuals seeking to enhance well-being in the workplace and beyond. By recognizing that job satisfaction is just one facet contributing to overall life satisfaction, organizations can focus on holistic approaches to employee well-being, considering factors beyond traditional work-related metrics. Policymakers can use this information to design strategies that promote well-being across various domains, fostering healthier work environments and work-life integration. Lastly, individuals can gain insights into the multifaceted nature of life satisfaction, leading to more balanced and informed decisions regarding their career and personal aspirations.

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Appendix 1

World Area	Job Satisfaction from the Mean	Happiness Index from the Mean	Human Development Index from the Mean
Africa	-4.5%	-25.75%	-28.66%
Central Asia	4.25%	-0.04%	-4.49%
East Asia & Pacific	-1.44%	4.68%	-1.11%
Europe	5.73%	12.17%	12.29%
Latin America & The Caribbean	-2.00%	4.52%	-3.32%
Middle East & North Africa	-5.62%	-18.30%	-4.86%
Northern America	11.00%	23.99%	20.37%
Russia	1.00%	-2.80%	-100.00%
South Asia	1.00%	-23.19%	-15.65%