World Happiness Report

(COMP3125 Individual Project)

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*Abstract*— This project explores global happiness using data from the World Happiness Report and UNESCO, focusing on the factors influencing happiness, such as economic stability, education, and regional differences. Through time series analysis and correlation studies, the research identifies possible trends in happiness levels over time and examines how these factors interact to shape well-being across various regions. While this project uncovers valuable insights, it also emphasizes the complexity of happiness and the need for further research to understand the deeper causes of these trends.

# Introduction

# Happiness is one of the most important things in human life. This project explores world happiness, focusing on the factors contributing to happiness and how these factors vary across different countries and demographic groups. Using data from the World Happiness Report and UNESCO, I will explore trends and develop correlations that provide a deeper understanding of global happiness. There are a few questions that are guiding this analysis: How have global happiness levels changed over time? Are there common trends or anomalies? What regional groups report higher happiness, and is there data that explains why this might make sense? Furthermore, how do factors such as economic stability influence happiness levels? Does education also have an impact on happiness? Current research highlights that happiness is extremely complex, influenced by a combination of personal, social, and structural factors.

# Datasets

## Source of dataset

The educational data used in this study was sourced from UNESCO, a renowned international organization that specializes in promoting education, science, and culture. UNESCO offers a wide range of data related to education, including global indicators on learning outcomes, literacy rates, and educational attainment. The data was generated through extensive surveys, country reports, and collaborations with national governments and international organizations. Along with this, I used data from the World Happiness Report, a global survey that ranks countries based on subjective well-being, also known as happiness. The World Happiness Report is updated annually, with the most recent dataset being from 2024.

## Character of the datasets

The UNESCO and World Happiness Report datasets vary in format, size, and the parameters they contain. To deal with discrepancies in the country lists and formats between the two sources, I created two additional datasets for regional mapping. This allowed for the proper alignment of happiness data across the same regions, ensuring that no critical data was omitted. The datasets were merged based on the "Country" column to combine happiness and education data. Specifically, happiness and education data were merged using the "country name" from the happiness dataset and the "country" from the education dataset. Similarly, the happiness data was merged with the country-region list to align happiness data with regional information.

For data cleaning, any rows with missing values were removed to avoid bias in the analysis. Additionally, data was filtered to remove irrelevant or extraneous entries, focusing on the years and countries most relevant to the questions.

This is what each dataset looked like:

|  |  |  |
| --- | --- | --- |
| Data | Parameter | Description |
| Country-Region | Country, Region | Name of country with its corresponding geological region |
| World Happiness | Country name, year, Life Ladder, Log GDP per capita, social support, Healthy life expectancy at birth, Freedom to make life choices, Generosity, Perceptions of corruption, Positive affect, Negative affect | Data that focuses on happiness and some of the direct factors that impact happiness |
| UNESCO | NATMON\_IND, Indicator, LOCATION, Country, TIME, Time, Value | Data that focuses specifically on years of schooling throughout different countries and different years |

# Methodology

A. Time Series

I created a time series analysis to examine how global happiness levels have fluctuated over time. This approach involved calculating the annual average happiness score ("Life Ladder") for each year in the dataset and plotting this against time to observe any trends or patterns. The dataset spans multiple years, so by grouping the data by year and computing the mean for each year, a clear visualization of global happiness levels over time was generated. This approach is particularly useful to identify any increasing or decreasing trends or to understand how various external factors (economic crises, social changes) might correlate with happiness levels. However, the method assumes that past trends can help predict future behaviors. It may not fully account for sudden, unexpected changes, such as political upheavals or natural disasters, which may disrupt trends. I chose this method because it is the easiest to visualize how global happiness has evolved over time and whether there is a defined trend. I used Pandas to manipulate and aggregate the data by year, while Matplotlib was used to generate the visualizations.

B. Correlation Between Various Factors and Happiness

In addition to time series, I examined correlations between global happiness and other factors, including region, education, and economic stability. This analysis aimed to understand the relationships between these factors and happiness levels, which can provide insights into what drives happiness.

I analyzed how happiness levels differ by region. By grouping data by region, I calculated average happiness scores for each region and visualized this through a bar chart. This makes it easy to identify which regions report higher happiness levels. I analyzed the correlation between education levels (measured by average years of schooling) and happiness scores. By merging education data with happiness data, I was able to visualize the possible correlation between these variables, which can help identify whether higher education levels are associated with higher happiness. Finally, I analyzed economic stability (measured by GDP volatility) and its impact on happiness using the relationship between stable economies and reported happiness levels. By correlating economic stability data with happiness scores, I managed to come up with a visual that highlights whether countries with more stable economies tend to report higher happiness.

# Results

A. Analysis of Global Happiness

A graph with a line going up

Description automatically generated

Fig. 1. Global Happiness levels over the years.

The analysis of happiness scores over time revealed a notable pattern. In 2007, happiness levels began at a relatively low point, followed by a gradual decline in subsequent years. There are several different reasons why this decline could have occurred: Natural disasters, mental health crises, increased social media (and misinformation), etc. While these factors could have contributed to lower happiness levels, further analysis and research would be required to pinpoint the exact causes.

However, between 2016 and 2020, happiness levels saw a sharp increase, reaching an all-time high. This could be linked to several factors, including improved social support and increasing access to health care and education in many parts of the world. Things like Pokémon GO taking everyone out of the house probably played a role in this, creating more social interaction and boosting stimuli for everyone. The rise in happiness in this period contrasts with the sharp decline in 2021 and 2022, likely due to the COVID-19 pandemic, which brought unprecedented health, social, and economic challenges to the global population.

As of the most recent data in 2023, happiness levels are on the rise again, but it remains uncertain whether this upward trend will continue. Current factors like political instability, climate change, and future global health crises could significantly impact future happiness levels, making predictions challenging.

B. Regional Comparison of Happiness

1) Happiness only by region

Surprisingly, Oceania emerged as the highest region in terms of average happiness, followed by North America, Europe, South America, Asia, and finally Africa. This result might seem surprising at first glance, but it may reflect the economic prosperity and high standards of living in regions such as Oceania and North America.

Oceania’s dominance in happiness levels could be attributed to countries like Australia and New Zealand, which consistently rank high in terms of life satisfaction, social support, and individual freedoms [1]. North America (particularly the United States and Canada) also reports high happiness scores, driven by factors such as economic opportunities, social support networks, and relatively high standards of living, but things seem to be changing [2]. While this trend aligns with expectations, it is important to note that happiness can be influenced by various subjective factors that may not be fully captured by just looking at location alone. This is why I decided to look at education and economics, to capture a big 3 and see how each might influence happiness.

2) Happiness by Education (by region)

First, I looked at the average years of schooling by region and came up with this: Europe, Oceania, North America, Asia, South America, Africa. I then decided to plot this data on top of the regional data to see if there were similar trends, and this is the result:

A graph of a bar chart

Description automatically generated with medium confidence

Fig. 2. Average Happiness and Education by Region

There seems to be a slight bit of a correlation between education and happiness. The general conclusion to make from this is that the regions that report low happiness will have lower years of schooling, relative to the other regions.

However, it is important to remember that these findings should be interpreted with caution. Regional differences in happiness are also influenced by cultural, historical, and political contexts. For example, countries in Europe might rank slightly lower than Oceania or North America, but factors such as public health systems and social policies that promote well-being may still result in relatively high happiness levels. Additionally, if we were to take out some countries from a region, their education levels could plummet or skyrocket. If we were to isolate the United States as its own region, it would have an education score of over 13, but since there is more than just the United States in North America, the average is brought down.

3) Correlations: Economic Stability and Happiness

The final finding also shows there is some correlation between economic stability and happiness. This means that, on average, the more economically stable a country is, the higher the reported happiness levels among its citizens. Economic stability often translates to better job security, consistent access to essential services, and reduced levels of stress caused by financial insecurity—all of which contribute to higher life satisfaction [3].

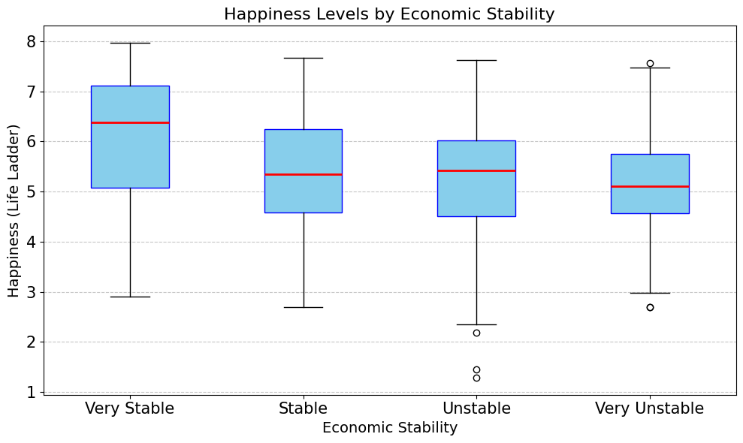


Figure 3. Happiness Levels by Economic Stability.

The trend we see from the data might not be extremely convincing but taking into consideration the fact that this is not the only factor that contributes to happiness, this trend is consistent with existing research. However, it is worth noting that this correlation does not necessarily imply causality. In terms of economic stability, while the correlation between a stable economy and happiness exists, political stability, environmental factors, and cultural attitudes once again all play significant roles in determining the overall well-being of a population.

# Discussion

The results of this project were valuable insights into the factors influencing global happiness, particularly the roles of economic stability, education, and regional characteristics. However, there were some limitations and areas where further analysis could improve the findings. While I made efforts to clean and merge datasets, some countries had missing or inconsistent data, especially when combining happiness and education indicators. This could have led to biases in the results, particularly in countries with incomplete or unreliable reports. All these findings highlight a trend, but deeper analysis would be needed to establish causal relationships. Although regional comparisons provided a useful overview, they may have oversimplified the impact of local contexts. For example, regions like Oceania or North America were highlighted as having higher happiness levels, but this does not account for the complexities within the countries themselves. A more granular analysis at the country or city level might reveal different insights, especially in larger, more diverse countries.

Future Work

For the future, including more data sources, including more recent and localized surveys or qualitative research to complement the World Happiness Report would strengthen my analysis. A study that follows the same population over several years could help identify deeper causal relationships between factors like economic stability, education, and happiness. This approach would also help assess the long-term effects of crises (something like COVID-19) on happiness. Although economic stability, region, and education serve as significant factors, future research can dive deeper into a variety of other influences on happiness, such as mental health awareness, social cohesion, and access to technology, to name a few. Incorporating a more diverse set of happiness measures, such as behavioral data, or using multi-dimensional indicators beyond self-reported life satisfaction, could help address the issue of cultural bias in happiness ratings. If I had gathered more data on the economics of countries/regions, I believe that the final graph would show a much stronger correlation. There is a lot of interesting data available, but it becomes increasingly harder to find data for regions and countries that are ranked lower on the happiness index, non-surprisingly. The infrastructure is typically very weak in these countries, which makes this kind of research especially difficult.

# Conclusion

This project has revealed important correlations in global happiness, particularly with regard to the influence of economic stability, education, and location. However, the findings underscore the complexity of happiness, indicating that factors like cultural, political, and social contexts must be considered when interpreting these trends. While there were limitations in the datasets, such as missing or inconsistent data for some countries, the insights from this research contribute to a broader understanding of the external factors influencing happiness. This research has important implications for policymakers and organizations focused on enhancing global well-being. By promoting economic stability, improving educational systems, and fostering social support networks, countries can boost the happiness and overall life satisfaction of their populations. Moreover, recognizing the regional and cultural factors that impact happiness can help create more effective and context-specific policies to improve quality of life worldwide.

##### Acknowledgment

##### References

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