
WORLD HAPPINESS REPORT

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ABSTRACT

The world happiness report is a significant survey that indicates how happy each nation is. It has the potential to guide policy making decisions by governments based on markers and it can be valuable in observing the effects of the pandemic. In this paper, we investigate the world happiness dataset that holds the happy score for each country, as well as factors that may contribute to the results. The goal in this research was to investigate the regions that score the highest or lowest for happiness, factors that contributed to the results and how and if they may have changed over time. Data exploratory analysis was used and showed that countries that can be categorized as high income often would score higher for happiness.

Keywords: Happiness, Country, World Happiness report.

INTRODUCTION

There are many factors that influence the scores for happiness for the citizens of that country. Multiple studies conducted that investigate how circumstances such as corruption and freedom to make independent choices has an impact on how well the citizens are doing for example, the effects of crime and corruption on happiness in Latin America [1]. This can be used to evaluate the exploratory analysis of the dataset. The aim of this paper is to evaluate which regions are reported to be happier and the factors that may contribute to these results.

1. ANALYTICAL QUESTIONS AND DATA

1.1 Analytical questions and data

The overall aim of this paper is to explore how happiness changes across countries and what factors may influence this. Demonstrated below are a series of questions that we will be investigating:

1. What region ranks the highest in overall happiness?
2. How did countries happiness rank or score change over time?
3. Which countries experience a significant increase or decrease in happiness?

4. What key factors contribute to happiness.

Since the pandemic has created catastrophic waves across the world, affecting people's health, countries economy and restricted movements, there is interest into how this would affect the year 2021 happiness report. Additionally, a look into whether peoples living conditions are improving across the world to make their lives feel less burdened.

1.2 Data

This research paper is aligned with the *World Happiness Report 2021* in partnership with center for economic performance and center for sustainable development [2]. This paper would be investigating how happiness rank across countries. Happiness is defined as a how satisfied you are with your life [3]. This data was sourced from *Kaggle* [4]. Happiness scores and rankings were gathered from the Gallup World poll [5]. The columns that will come after the happiness score and may have an impact on the ranking for happiness are GDP, social support, life expectancy, freedom, corruption and generosity. The number of rows and columns in the dataset are 20 x 150 respectively.

	Ladder score	Standard error of ladder score	upperwhisker	lowerwhisker	Logged GDP per capita	Social support	Healthy life expectancy	Freedom to make life choices	Generosity	Perceptions of corruption
count	149.000000	149.000000	149.000000	149.000000	149.000000	149.000000	149.000000	149.000000	149.000000	149.000000
mean	5.532839	0.058752	5.648007	5.417631	9.432208	0.814745	64.952799	0.791597	-0.015134	0.727450
std	1.073924	0.022001	1.054330	1.094879	1.158601	0.114889	6.762043	0.113332	0.150657	0.179226
min	2.523000	0.028000	2.596000	2.449000	6.535000	0.463000	48.479000	0.362000	-0.288000	0.082000
25%	4.852000	0.043000	4.991000	4.706000	8.541000	0.750000	59.802000	0.718000	-0.126000	0.667000
50%	5.534000	0.054000	5.625000	5.413000	9.569000	0.832000	66.603000	0.804000	-0.036000	0.781000
75%	6.255000	0.070000	6.344000	6.128000	10.421000	0.905000	69.600000	0.877000	0.079000	0.845000
max	7.842000	0.173000	7.904000	7.780000	11.647000	0.983000	76.953000	0.970000	0.542000	0.939000

Figure 1. Summary of the data frame.

[Figure 1] shows the summary of the data frame, no cleaning of the data was needed as there were no missing values. This dataset is suitable for answering the analytical question proposed earlier because one of the columns includes a list of the countries involved, to which I can then map and compare them to each other, to evaluate any patterns overtime. The assumptions I would be making for this dataset would be it would show a linearity relationship between happiness score and variables that have a relationship with this factor.

1.3 Analysis

In order to examine and answer the research questions, the subsequent plan was laid out. Please take note that the order of the sequence was not rigorously followed and at times required for previous steps to be revisited in order to get the most optimized results.

1. Upload dataset.
2. Data transformation and feature selection.
3. Bar graph for countries happiness
4. World map plot
5. Correlation between features pairwise plot
6. Correlation map to identify features between variables
7. Line graph to explore relationships.

2. Findings, Reflections and further work

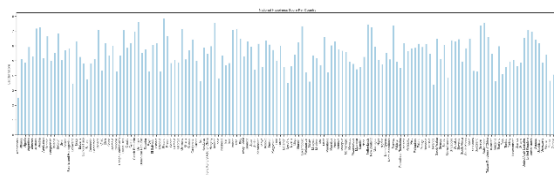


Figure 2. Happiness score for every country in the dataset.

To begin with, the happiness score was tallied up in a bar graph, where each bar represented a country from the dataset as shown in [Figure 2]. This graph helped to visualize which country ranked the highest in overall happiness, which was shown to be Finland, a high-income country. Further research which found that the low crime rate and universal health care system helped back this discovery [6].

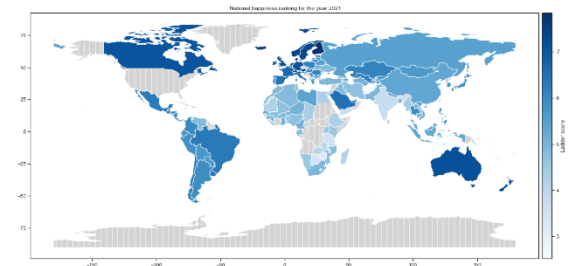


Figure 3. World map showing happiness score.

To understand how happiness is spread around regions across the globe, the ladder score which is a column in the dataset that contained the happiness score was plot on a world map with a legend attached to it. The map shows that countries which would be high income countries score higher in comparison to third world countries. This map answers the first question, that was asked earlier in the report.

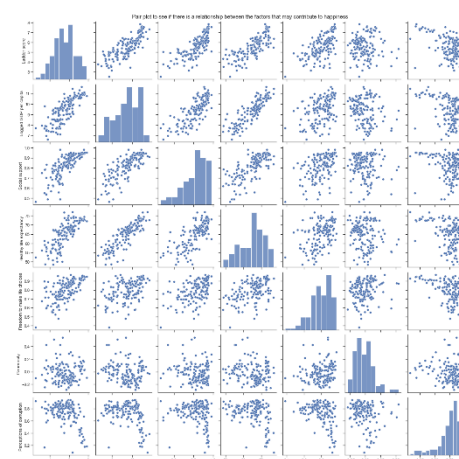


Figure 4. Pairwise scatter plot for variables.

To get a quick overview of the relationship between each variable in the dataset, a

scatterplot matrix was conducted to see if any variable increased or decreased in relation to each other, or in some cases there are no relationships. [Figure 4] helps us to answer which key factors contribute to the happy score, further study of this is continued further in the report.

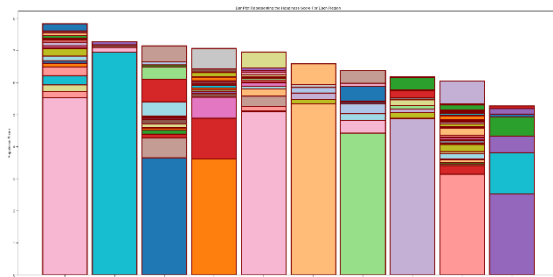


Figure 5. Bar graph representing the happiness score for each region.

Countries which would be classified in Western Europe was the region that had the highest score for happiness and south Asia was the region with the lowest score. One reason for this disparity in results could be income as the GDP between the two regions are significantly different.

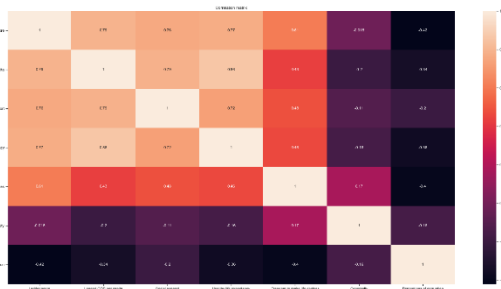


Figure 6. Correlation matrix for selected variables.

Selected variables chosen from the pairwise scatter plot that was shown to have a strong relationship to the ladder score was plotted into a correlation matrix [Figure 6] to get a clearer outlook into the relationships between the variables. This also helped to answer the key factors that contribute to the happiness score.

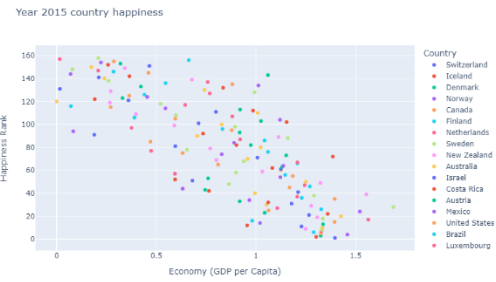


Figure 7. 2015 Country happiness and GDP

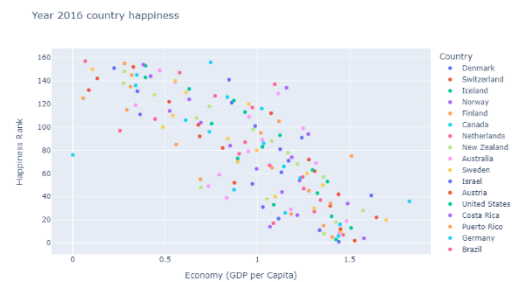


Figure 8. 2016 Country happiness and GDP

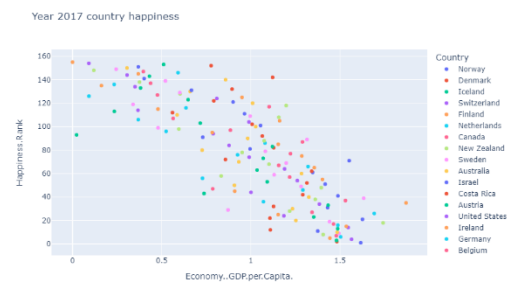


Figure 9. 2017 Country happiness and GDP



Figure 10. 2018 Country happiness and GDP

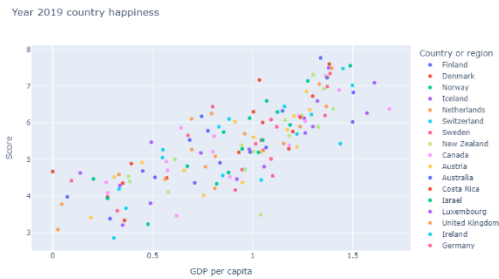


Figure 11. 2019 Country happiness and GDP

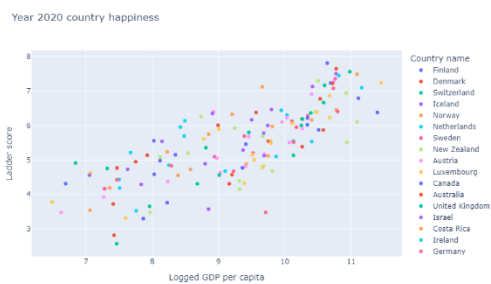


Figure 12. 2020 Country happiness and GDP



Figure 13. 2021 Country happiness and GDP

A scatter plot comparing the GDP to happiness score for countries across the globe over the years from 2015 to 2021 was plotted. From observation, it was found that up to the year 2017 there was a negative correlation between GDP and happiness, but after 2017 there was a positive relationship which showed that as a countries GDP increased so did the score for happiness. A reason for these changes would be a developed country with a high GDP per capita would have improved educational resources, more spending for healthcare, better tax revenues and more consumption but an economic growth has no effect on increased crime rates, diseases more present in developed countries such as

obesity and cancer, enviromental costs due to pollution and fading utility of income [7].

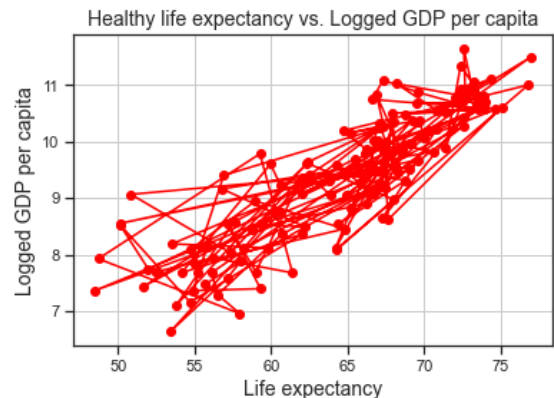


Figure 7. Line graph for life expectancy against GDP.

A graph was plotted to further examine the relationship between GDP and life expectancy as both of these had a strong relationship to the ladder score. It was found that as the GDP of the country increased, then so did the life expectancy.



Figure 8. Line graph for Happy score against corruption.

A line graph was created for happy score against corruption. The results were unclear.

CONCLUSION

It was found that the GDP of a country has a greater impact on the happiness score of a country since the regions that contains countries classified as developed showed higher results in the ladder score. Limitations to this research would be how the pandemic may have skewed the results. Future work would be further investigating the factors that affect the

happiness score and relating it to real life cases that may help politicians and government bodies to make decisions based on the results as well as further investigate machine learning resources to predict the outcome.

Word Count:

Introduction = 92

Analytical Questions and Data = 120

Data = 207

Analysis = 85

Findings, Reflections and Further Work = 597

REFERENCES

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