

Who is Happy in the World and Why?

Introduction

I am interested in investigating what affects happiness around the world and how happiness has changed over time.

Data

Data from the 2021 World Happiness Report¹ was used to create the first four figures below. It contained 149 countries and 20 features. An additional fifth figure was created using reports from 2015-2021^{2,3} to track changes in the ladder ('happiness') score over the years. In the report, happiness was measured through the Cantril ladder score which corresponds to a scale from 0 to 10, with 0 being the worst possible life and 10 being the best possible life a person could be living. Participants are then asked to rate their lives on this ladder scale. More variables that have been found in research literature to potentially explain differences in life-evaluations (and are available for all given countries) are also included in the data⁴.

¹ <https://worldhappiness.report/ed/2021/> (report from 2021)

² <https://www.kaggle.com/unsdsn/world-happiness> (reports from 2015 to 2019)

³ <https://www.kaggle.com/londeen/world-happiness-report-2020> (report from 2020)

⁴ <https://worldhappiness.report/faq/>

Figures

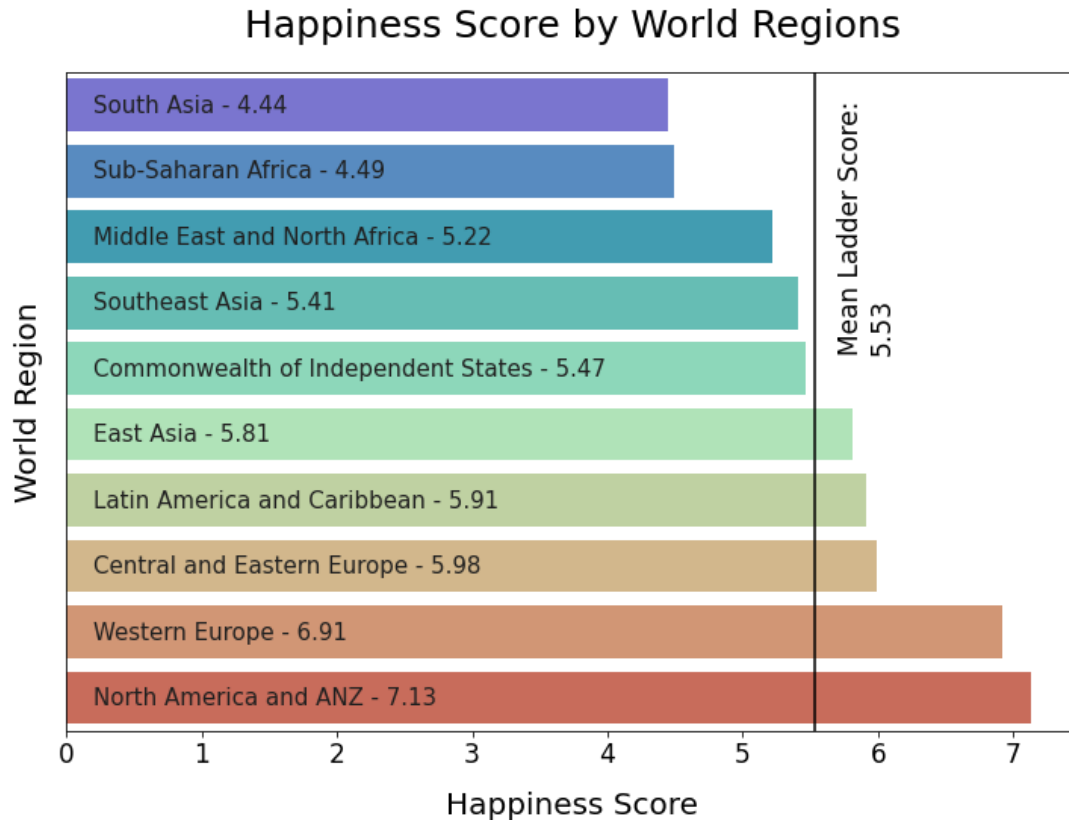


Figure 1. The bar plot above displays the mean ladder (‘happiness’) score by world region in 2021, with the mean ladder score listed by the region. The overall mean ladder score for all countries is plotted as a reference point.

To investigate happiness throughout different world regions, the figure above was created to show the mean ladder score grouped by world region. East Asia, Latin America, Central and Eastern Europe, Western Europe, and North America and ANZ all have scores above the mean ladder score (5.53). The North American and ANZ region also have the highest average score overall (7.13). The Commonwealth of Independent States, Southeast Asia, Middle East and North Africa, Sub-Saharan Africa, and South Asia regions all have score lower than the overall mean with the South Asian region have the overall lowest score. From this bar plot, it appears that the ‘happier’ regions are also the ones that are generally considered to be more developed.

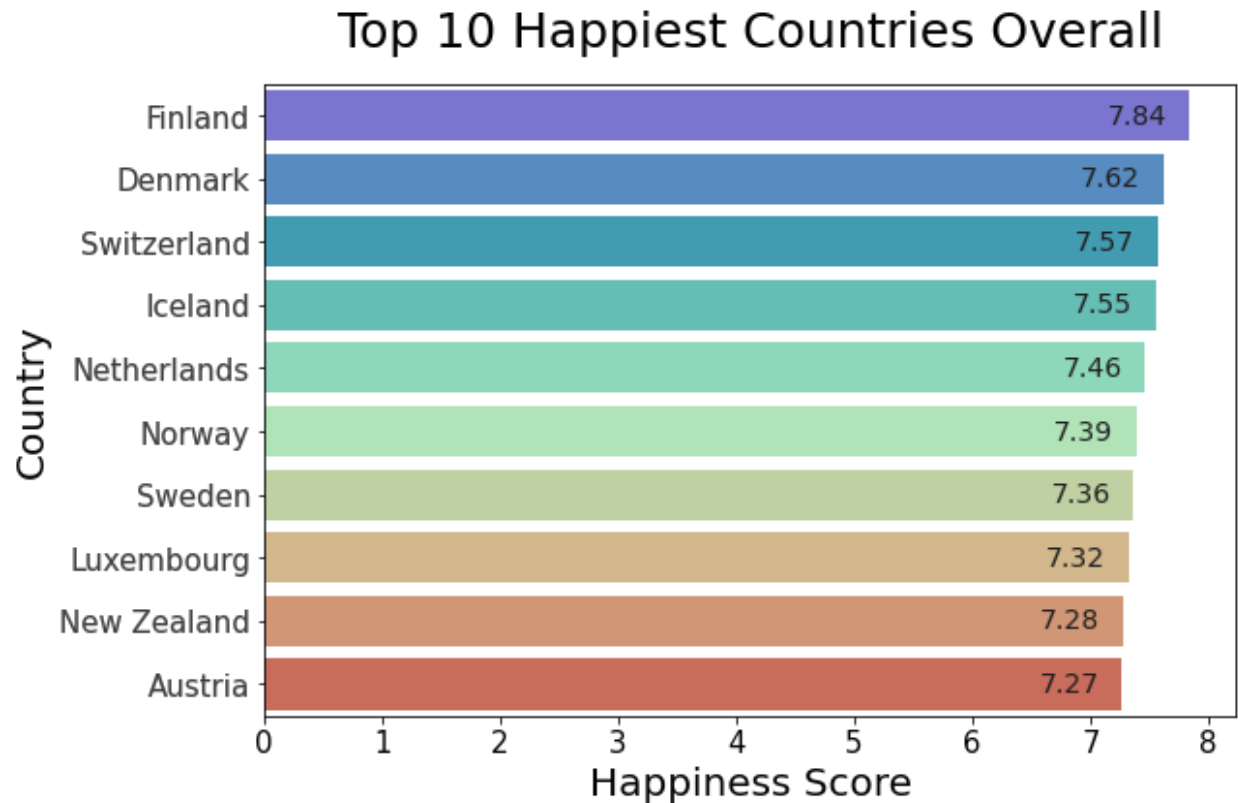


Figure 2. The figure shows the ladder (‘happiness’) score for the ten countries that have the highest ladder score in 2021.

Next, to investigate which countries have the highest ladder (‘happiness’) score overall, the countries were sorted by their ladder score and the top ten are shown in the bar plot above. All the countries displayed are European, except for New Zealand. Finland has the highest overall score of 7.84. Thus, in researching how to improve countries’ ladder scores, Finland could be used as a prime example in their social and economic practices.

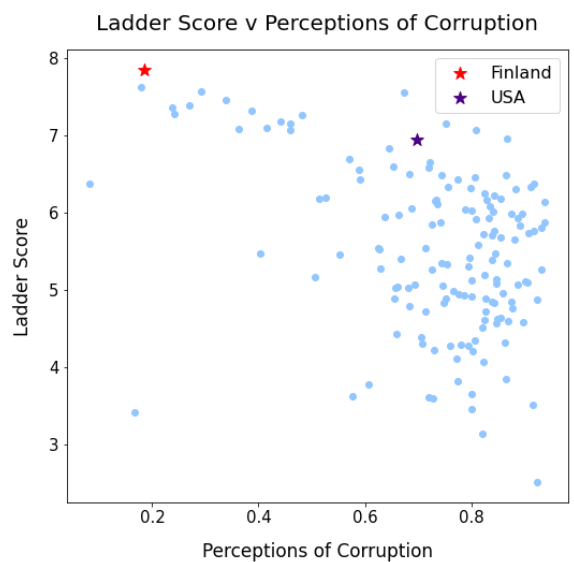
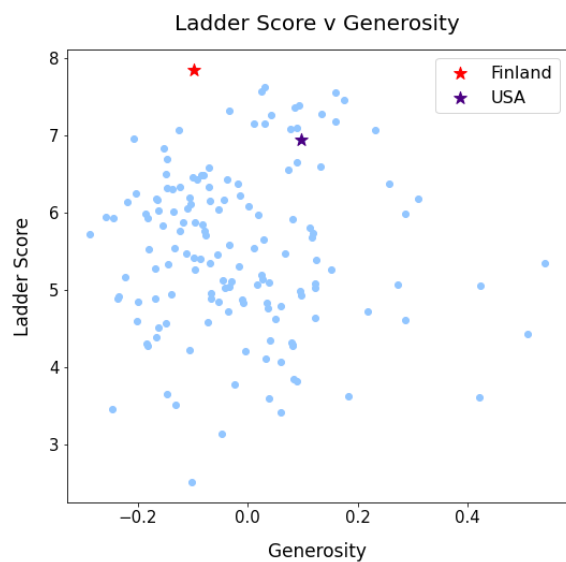
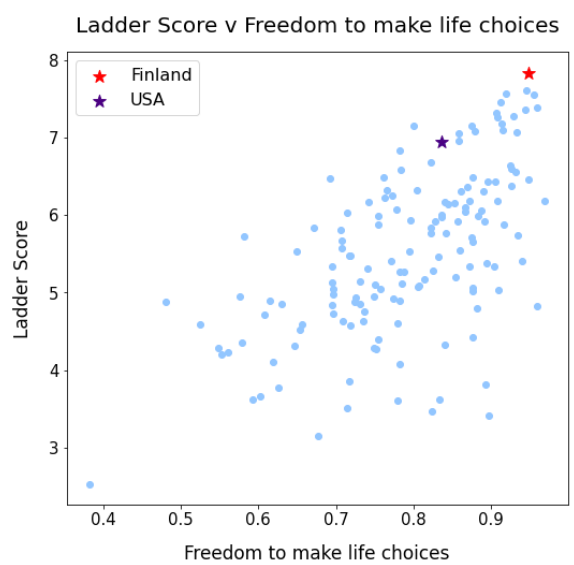
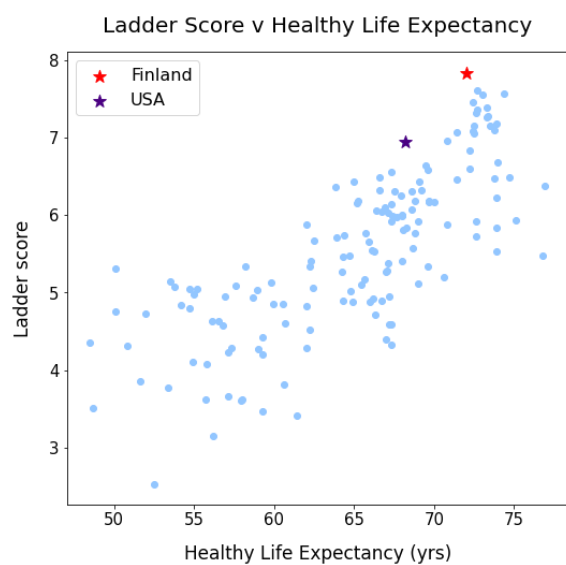
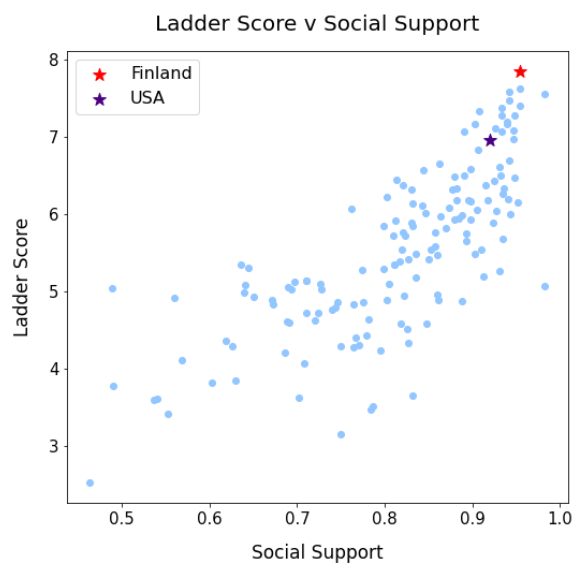


Figure 3. The plot above contains scatter plots of the ladder score against different features that could potentially be correlated to happiness. These features include logged GDP per capita, social support, healthy life expectancy, freedom to make life choices, generosity, and perceptions of corruption for each country. Finland, the country with the highest ladder score, is plotted for reference, as well as the United States since that's the country we live in.

From the scatter plots above, logged GDP per capita, social support, and healthy life expectancy (yrs) have strong positive correlations to ladder score as the points increase along both axes. Freedom to make life choices appears to also have a positive correlation to ladder score, however the correlation is not as strong. Generosity appears to have no correlation to ladder score since the points form a shapeless cloud. Perceptions of corruption has a slight negative correlation to ladder score with lower perceived levels of corruptions, but the ladder score has a very large spread with higher perceived levels of corruption. Finland, which has the greatest overall ladder ('happiness') score, is used as a reference when investigating how these factors may correlate to their ladder score. Finland has high logged GDP per capita, social support, and freedom to make life choices. Thus, countries with lower ladder scores may want to investigate Finland's economy and social support structure to increase their country's 'happiness'. Finland has a lower generosity score, but as previously state, generosity does not appear to be correlated to ladder score. Finally, Finland has nearly the lowest score for perceptions of corruption which potentially may further contribute to their high ladder score. In all variables that are correlated to the ladder score, the United States has values less than Finland (except for GDP which is close, and perceptions of corruptions which is greater) which could potentially correlate to its decreased ladder score. The United States has a higher value for generosity; however, ladder score did not appear to be correlated to generosity. Ultimately, more research would have to be done to determine if any of these features directly affect ladder score, but they may serve as a good initial point (especially investigating Finland's economic, social, and health policies) if countries are searching for way to improve their ladder score and make citizens 'happier'.



Figure 4. The scatter plot above shows the ladder (‘happiness’) score vs median income⁵ for countries in which both types of data were available in 2021. The points are also color coded by world region.

Investigating the renowned question of ‘does money buy you happiness?’, the scatter plot above indicates that it may. There is an overall positive correlation between median incomes (\$) to ladder score for each country. It appears that countries in Western Europe and North America and ANZ regions have greater median incomes and higher ladder scores. Countries in Sub-Saharan Africa have very low median incomes and lower ladder scores. However, as seen in *Fig. 3*, many other variables are also correlated to ladder score. Furthermore, it is also highly unlikely that median income directly affects ladder score and happiness. A more reasonable explanation would be that countries with greater median incomes are generally more developed, have better access to health care, and citizens are able to better provide for themselves and feel more secure. This could lead to individuals feeling healthier, more secure, and thus happier. Ultimately, while this plot shows an interesting correlation, it is not likely to contain a causal relationship. Hence, it’s unlikely that money buys ‘happiness’, but rather better health and life security (although also not conclusive).

⁵ <https://worldpopulationreview.com/country-rankings/median-income-by-country> (Median Income by Country 2021, additional sources to this data provided on website)

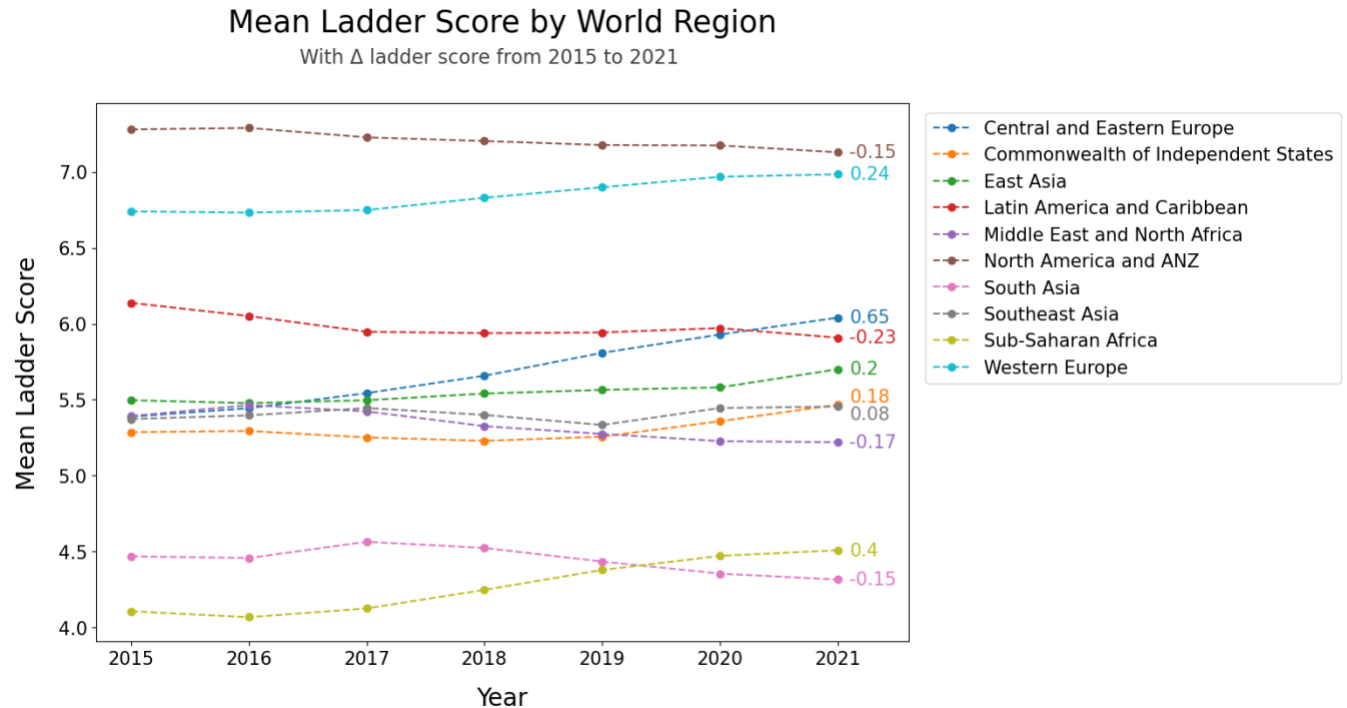


Figure 5. The plot above shows changes in mean ladder score over time from 2015-2021 by world region. The change from 2015 to 2021 (calculated as $\text{score}_{2021} - \text{score}_{2015}$) is included to the right of the lines.

Tracking changes in ladder score over time, the mean ladder score for each world region was plotted for each year from 2015 to 2021. Both the Western Europe and North American and ANZ region have consistently had the highest mean ladder score. Western Europe has seen an increase over time, and the 2021 mean ladder score for the region was 0.24 greater than the 2015 mean score. However, the North American and ANZ region had a decrease over time with the mean ladder score decreasing by 0.15 from 2015 to 2021. Out of the other world regions, the Central and Eastern European region had the overall greatest increase (0.65) in their ladder score since 2015. The Latin America and Caribbean region has had the greatest decrease in their ladder score, by 0.23, from 2015 to 2021. In future work, it would be interesting to focus on the Central and Eastern Europe region and investigate what changes in their social, economic, or health infrastructure were made since 2015 as potential causes for this increase in the region's ladder score. This could inform other regions and countries about actions they could take to also improve their ladder score, and ultimately the happiness of their citizens.