

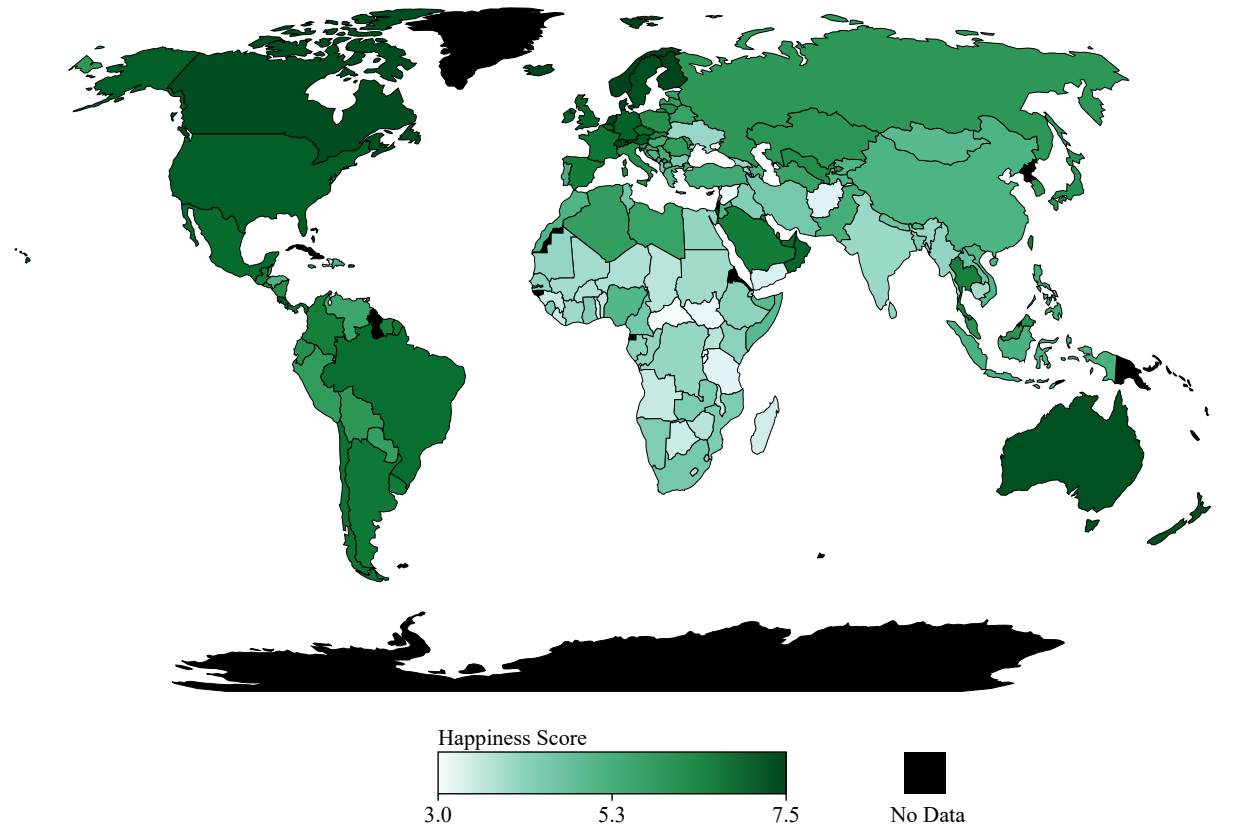
Final Project: World Happiness

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The purpose of this project is to analyze how happiness is correlated for every country in the world as well discover some possible correlations happiness has with different factors and variables. In this project, we'll be analyzing how a country/region's happiness score changes through time, area, and other variables.

What does happiness look like on the world map? Are certain continents or areas happier than others?

Average Happiness Score of Each Country



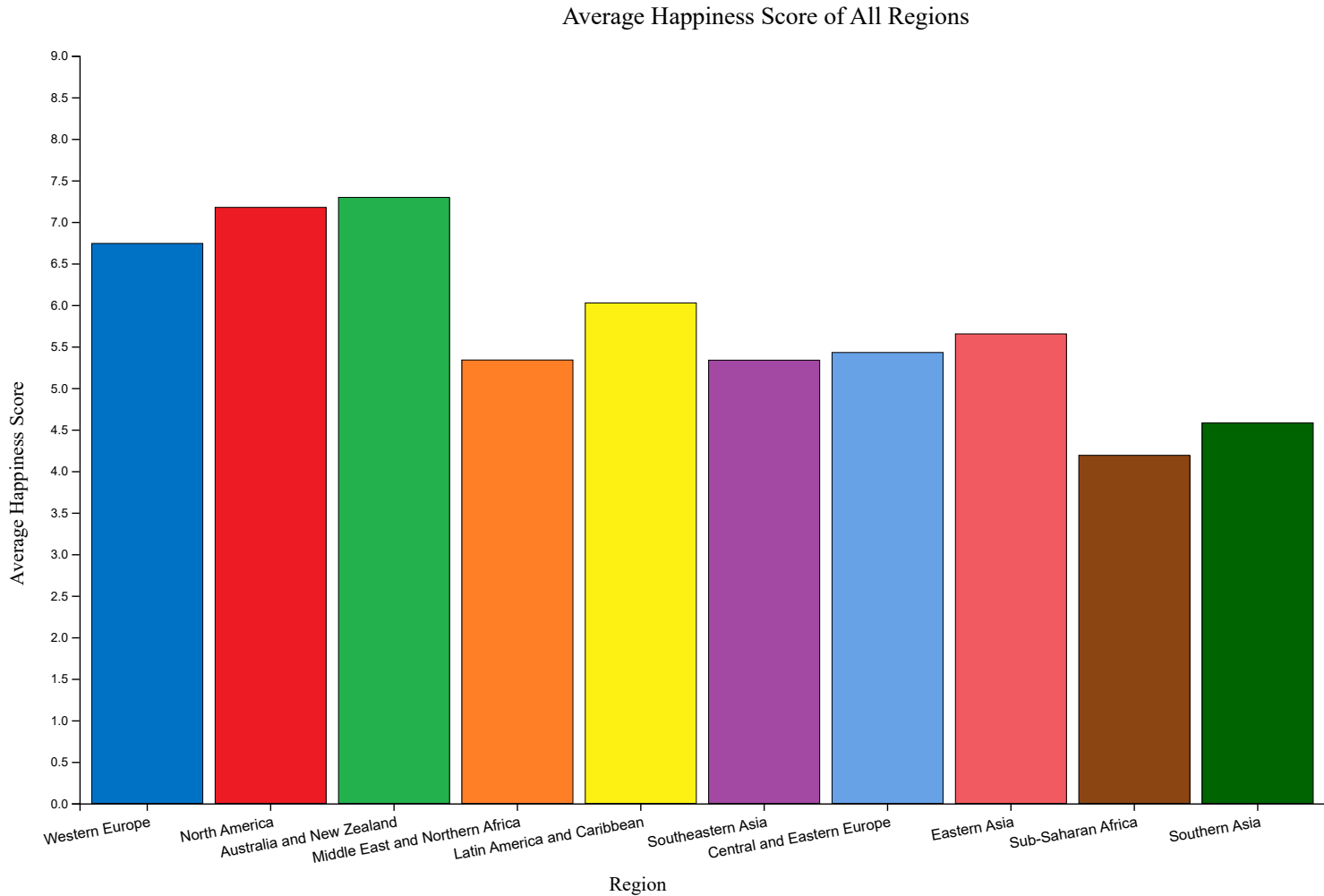
Story: I wanted to start off this project with a map of all the countries and their happiness scores to see if we can immediately see any patterns. From this map, we can see that North America, South America, Europe, and Australia are darker and thus more happy. Meanwhile in Africa and Asia, they tend to be less happy. Antarctica has no people living there so the color is black (as well as other countries I did not have data on).

Caption: I decided to use green for the color scheme because maps usually use the color green to represent land masses so I felt it was most appropriate. Initially, I wanted to use yellow since the color yellow is typically associated with happiness, but yellow is hard to see on a white background so I settled with green. Not all countries on the the map had data from my dataset, so I decided to use black to mark those countries as "no data" since black would be most distinctive to the average person and colorblind people. The 1 mark in this visualization is area, with each area representing a country. The 1 channel used in this visualization is

color, with it encoding the average happiness score of that country. I decided not to use tooltip on this visualization because I felt like it wasn't necessary for the reader to know the exact happiness score of each country in order to identify patterns and trends. I'd rather the reader focus on the general trends they see within the map and tooltip would take away from that.

Which region of the world is the happiest on average?

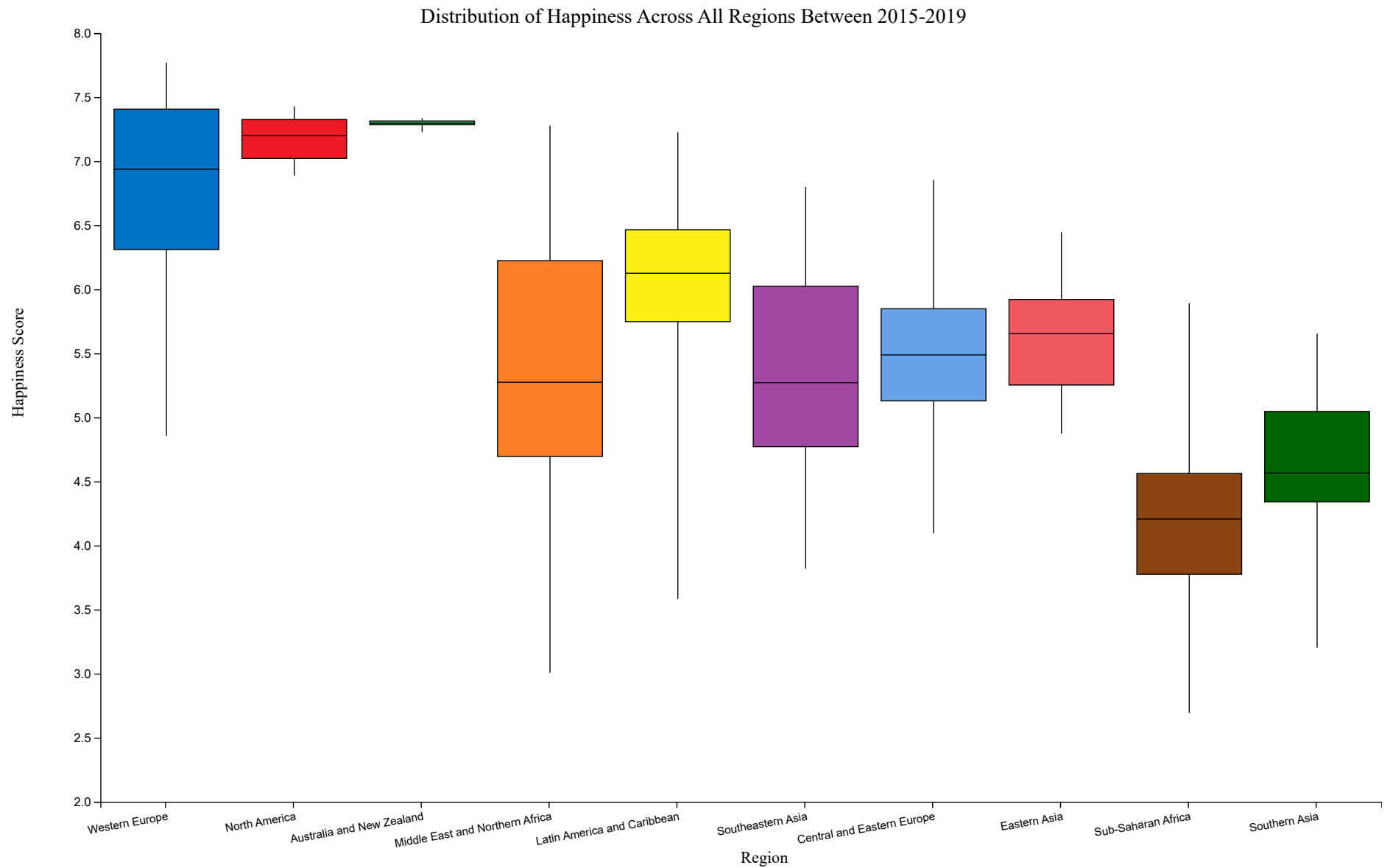
Sort Me!



Story: I chose to create this visualization because I wanted to have an official list of which regions of the world tend to be the happiest. As we can see from this bar chart, Australia and New Zealand tend to be the happiest of all regions. This data could be skewed however since the region of "Australia and New Zealand" only consists of two countries, unlike other regions that are more likely to have outliers that may lower their average happiness score. To see which countries this may be, I will create a box plot to view how the data varies for each region.

Caption: The colors I chose were meant to make it easy to distinguish each region from each other and make the chart more visually appealing. Since there were a lot of regions, I had to repeat some colors (i.e. blue and green) so I made sure that I used different brightness and saturation so that the shades were distinctive from each other. I also made sure that all the colors were different luminances for those who have black and white color blindness so at least all the bars did not look the exact same. There is 1 mark being used which are lines that represent each region. The 2 channels being used are color and vertical position. Color is meant to encode region and the vertical position is meant to show the happiness score. I also decided to slightly angle the text on the x-axis so that all the names would be visible since the region names can be long.

How does happiness score vary between different regions? Do some vary more than others?



Story: I created this visualization to actually see the spread of happiness scores across all regions. So far, we can see that "Australia and New Zealand", which was said to have the highest average happiness score in our bar chart, does have very little variance in its data. In this bar plot, we can see that Western Europe has the country with the highest happiness score however, since the data varies a lot it has a lower mean happiness

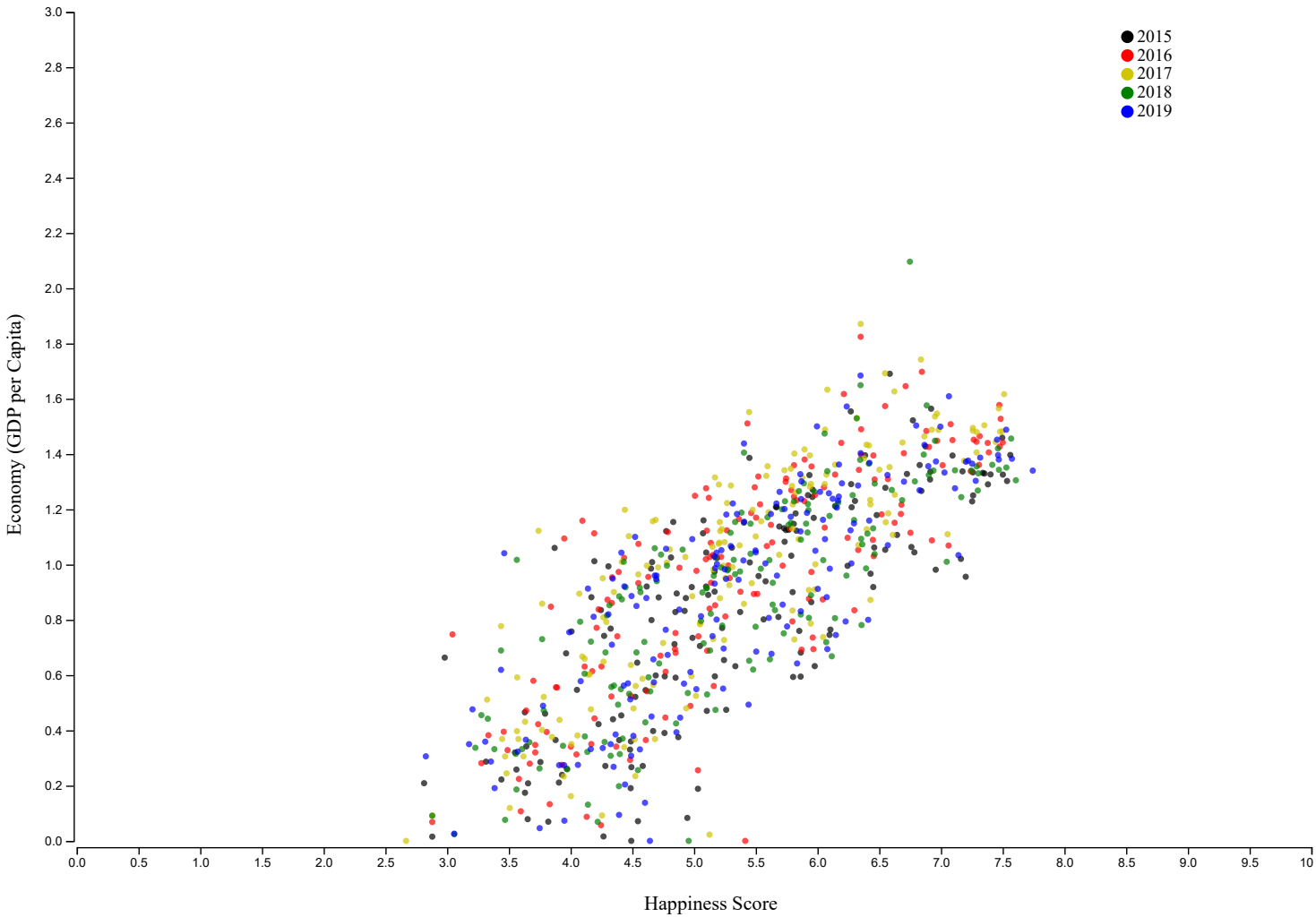
score than Australia and New Zealand. This plot goes to show that mean isn't the greatest way to measure a region's happiness score and it's important to take into account variations of data.

Caption: I used the same colors to represent the different countries from my bar chart. I did this to maintain consistency and prevent confusion when looking through my project. This visualization has 1 mark represented in lines. The lines are meant to show the minimum, maximum, median, 1st quartile and 3rd quartiles of happiness scores of each region. There are two channels: color and vertical length. Colors are meant to encode the region being represented and vertical length is meant to represent the variance in happiness scores. I also decided to slightly angle the text on the x-axis here as well so that all the names would be visible since the region names can be long.

How does happiness correlate with the different variables? How strong are these relationships?

● Economy ○ Family ○ Health ○ Freedom ○ Trust ○ Generosity

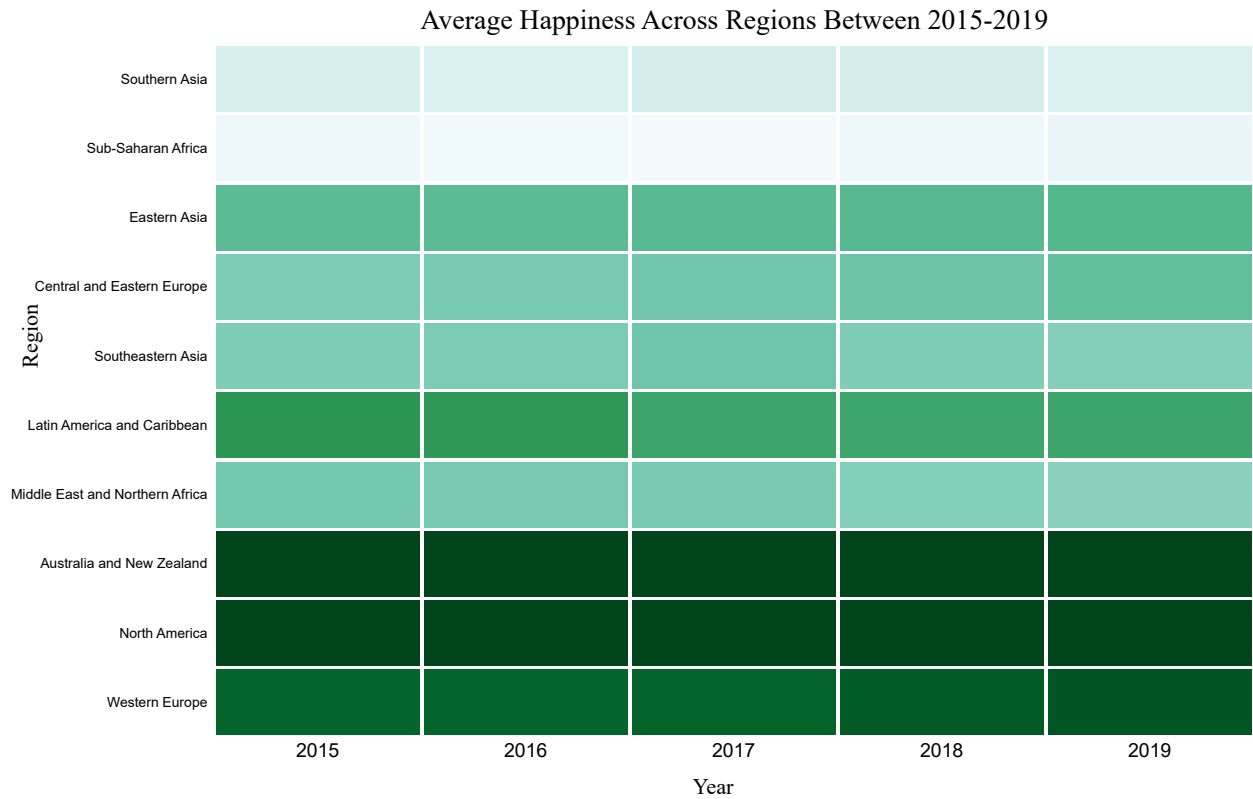
Relationship Between Happiness Score and Other Variables



Story: The reason why I wanted to create this visual was because I wanted to see if there were any strong correlations between each variable and Happiness Score. Based on this graph, we can see that Economy, Family, and Health have strong positive correlations with Happiness Score. Freedom also has a pretty distinct positive relationship with Happiness Score but it's not as strong as the previous 3 variables. Trust and Generosity don't seem to have a strong relationship with Happiness Score, as the data points appear fairly varied regardless of Happiness Score. I also wanted to note that in later years (2017-2019), Family and Health seemed to have improved compared to previous years.

Caption: The colors I chose for the scatterplot are meant to represent the different years the data came from. I chose these colors because they contrast very well together, so it is easier to see trends between different years as you flip through the different variables. Ideally, I wouldn't want to use this many colors since it's not very accessible to those who are colorblind, but the reason why I wanted to distinguish each data point by the year is because I wanted to see if there was any distinct patterns or changes that occur through the years. There is 1 mark on this plot with each point representing a country. There are 3 channels being used: color, vertical position, and horizontal position. The color represents the year the data point came from. Vertical position represents the score from each variable (i.e. Economy, Family, etc.). Horizontal position represents the happiness score of each country.

Across all regions, how has the happiness changed overtime between 2015 and 2019?



Story: In addition to finding possible correlations with different variables (i.e. Family, Economy, etc.), I wanted to see how time affected each region's happiness score. Based on this heatmap, it doesn't seem to be a distinct correlation between the years and average happiness scores. There are some changes but no discernible pattern.

Caption: I chose green again for the color palette because I wanted it to match the colors with the choropleth for the sake of consistency since in both plots, the color green is meant to represent average happiness score. The 1 mark being used in this visualization is area. The area is meant to represent a region during a certain year. The 2 channels being used are color and horizontal position. Color encodes the average happiness score of a region during that year with white being for smaller happiness scores and dark green for larger happiness scores. Horizontal position represents the years over time in chronological order. When choosing the

scale for this heatmap, I decided to use minimum and maximum instead of 0 and maximum because I wanted to make sure the colors can be discernible from each other as much as possible since there is very little difference over time for each region. It is also why I decided to use tooltips on this visualization since the differences in color were so minimal.