It's a Wonderful Life*:

A Look at the World Happiness Report (2015)

*with access to support systems, personal freedoms, and wealth

[redacted]

November 13, 2020 | SI 649

This week, I built an interactive dashboard called "It's a Wonderful Life*: A Look at the World Happiness Report (2015)." While the holiday season of feel-good songs and exaltations of thankfulness is almost upon us (or, according to Hallmark, it is *already* upon us), this dashboard aims to show a more complete picture of the factors contributing to the happiness or unhappiness of the world's nations.

This visualization built off of my findings from my previous research and creation of an infographic called "Do Happiness, Health, Wealth, and the Olympic Go Hand in Hand?". With the original infographic, my main goal was for viewers to be able to compare and contrast how Norway and the United States (along with a few other top nations) fared when each nation is assessed by its happiness, health, wealth, and athleticism:

Figure 1: "Do Happiness, Health, Wealth and the Olympics go Hand in Hand?" infographic

The infographic focused only on the top ranking countries in the datasets, not the bottom ranking, because Norway is a top-ranking country and that is what I wanted to compare my data points to. With this interactive dashboard, I examined the World Happiness Report data set again, but this time I included the full range of countries in the world. With a larger dataset and a fully interactive visualization, I developed the following learning objectives.

Learning Objectives

1. The user will be able to compare and contrast how nations across the world fare when assessed by happiness ranking and its attributes.
2. The user will be able to explain the relationship between a country's GDP and its rank in the World Happiness Index.
3. The user will be able to recall that the happiest nations are nations where several needs are fulfilled at the individual and national level, while the unhappiest nations are not able to fulfill these same needs.

Inspiration & Design Process

Again, I relied on Gallup World Poll's World Happiness Report as a data source (published annually, but I chose to use data from 2015 in order to maintain consistency with my infographic).

Surprisingly, I couldn't find many interactive dashboards on data from the World Happiness Report. There are a lot of geovisualizations, though. For example, Figures 2 and 3 both encode happiness on the world map:

Figure 2.1: The Geography of Happiness

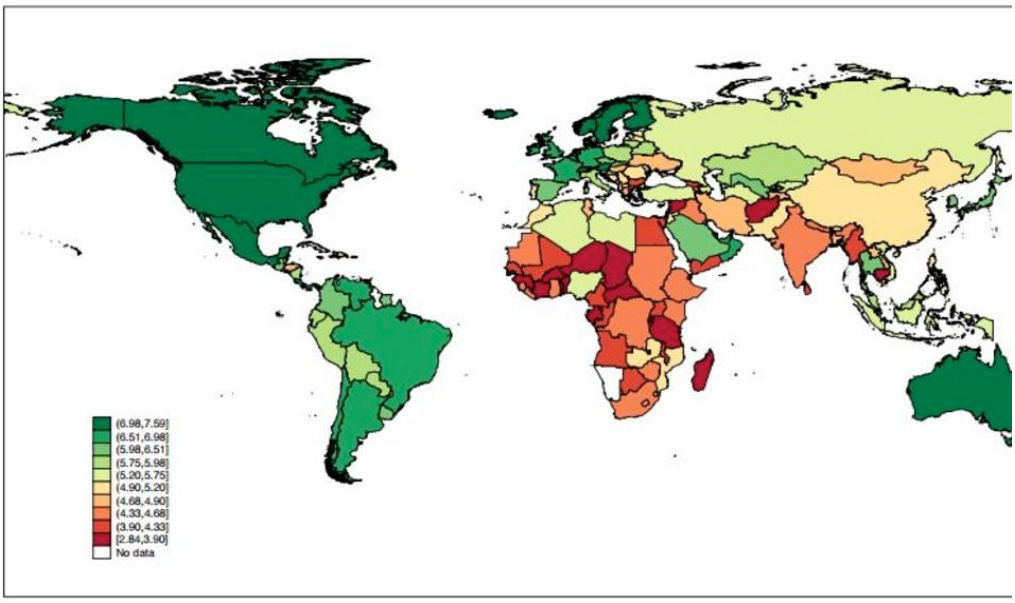

Figure 2: Static Visualization from U.S. News: 'These Are the 20 Happiest Countries in the World'

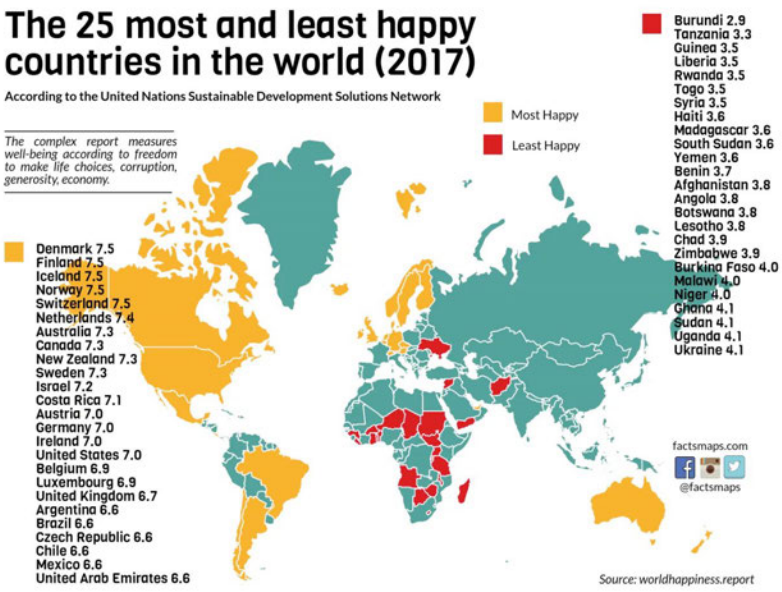

Figure 3: Static Visualization from FactsMap: [‘The 25 Most and Least Happy Countries in the World’]

It was harder to find visualizations based on past happiness reports with more comprehensive data included in the charts. I was able to find the bar graph below, which color encoded the aspects contributing to each country’s happiness ranking. This inspired me to use a similar approach, with bar graphs, to show the breakdown of the happiness score for each country when it is selected on the map or from the list of countries by GDP.

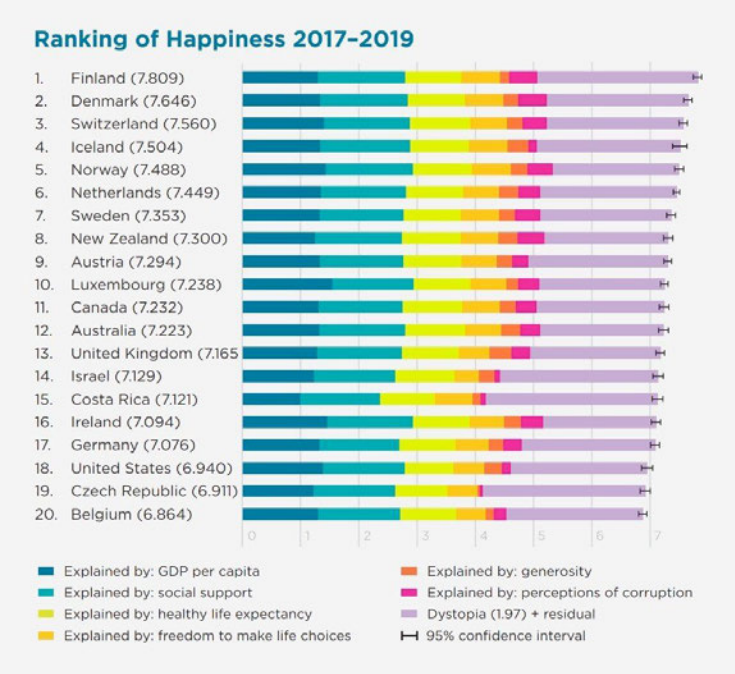

Figure 4: Stacked Bar Chart showing the World Happiness Report rankings from 2017-2019

Finally, I mentioned the visualization I found at the Happy Planet Index in my static visualization blog post. Again, it was the :

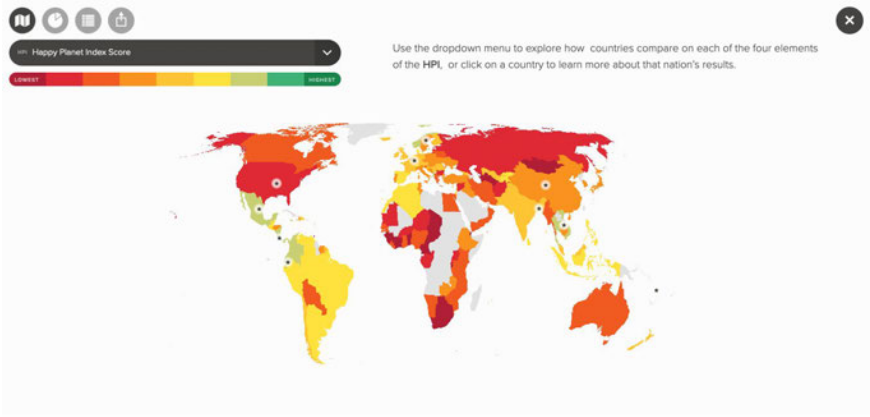

Figure 5: Life expectancy, ecological footprint, wellbeing, and inequality are the four categories that comprise the "happy planet index". Users can select one of those four options via the drop down menu to see the color-encoded outcome on the map. Zooming and panning are possible, and clicking on a country displays a tooltip with the country's name and ranking.

Because I had previously worked through designs with my static visualization, I already had a general idea of wanting to work with a geovisualization, and adding the ability to filter to see data for a specific country. This mostly meant that my experimentation and design iterations were all relatively similar, but differed a little in what I chose to encode and how I arranged the information on my dashboard. Figures 6-9 are examples of earlier stages in the design process, before I settled on the final design in Figure 10.

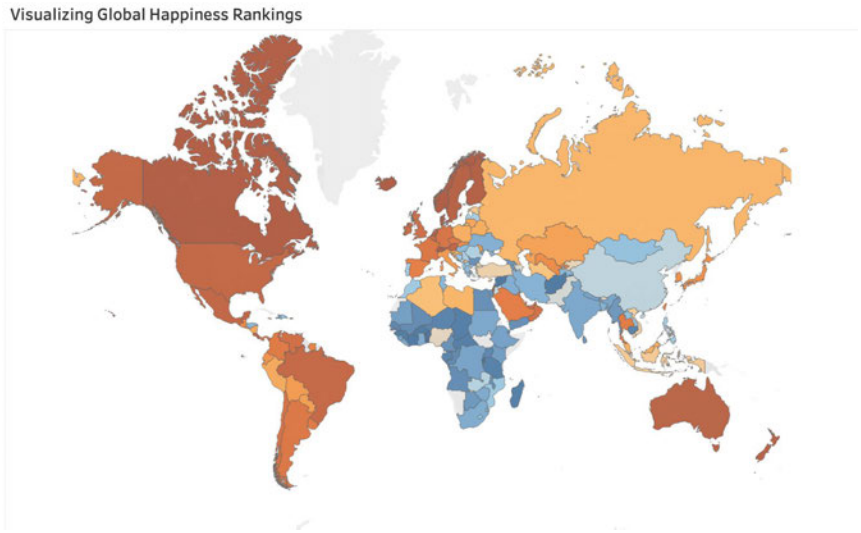

Figure 6: A return to the Global Happiness rankings encoded as a geovisualization, before I realized the value of encoding GDP by size of the dot with ranking by color

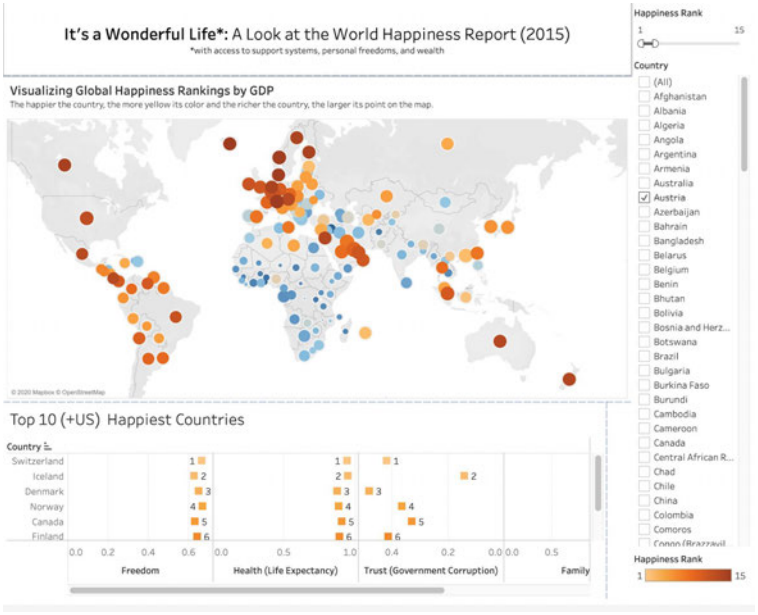

Figure 7: Settled on displaying a geovisualization with GDP and happiness ranking encodings, and debated including some version of the happiest countries by happiness factors below

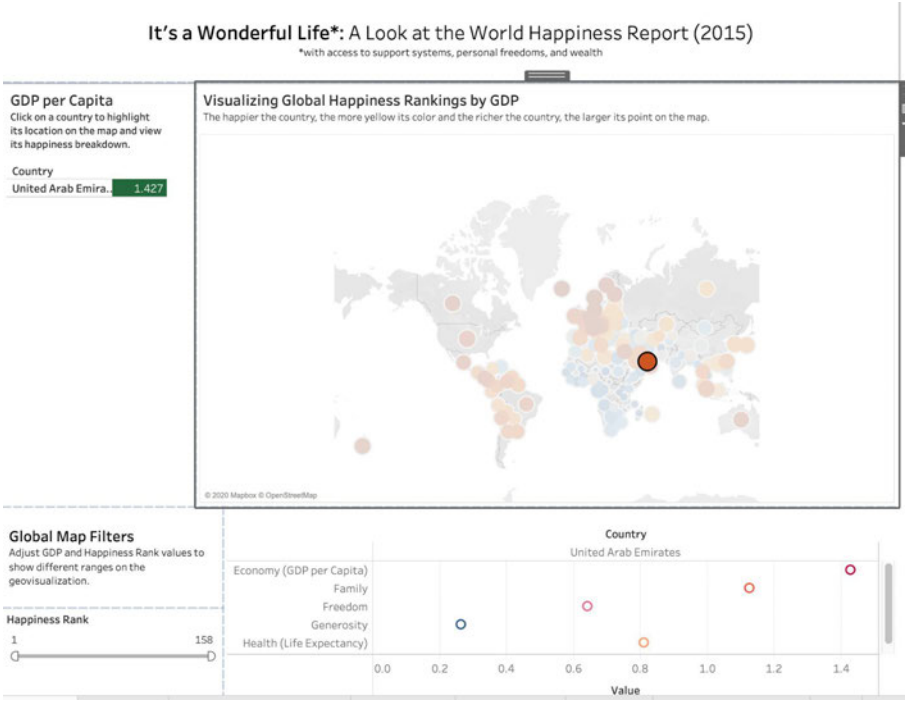

Figure 8: Created filters to connect the three visualizations, but didn't like the way the data was being displayed on the bottom plot

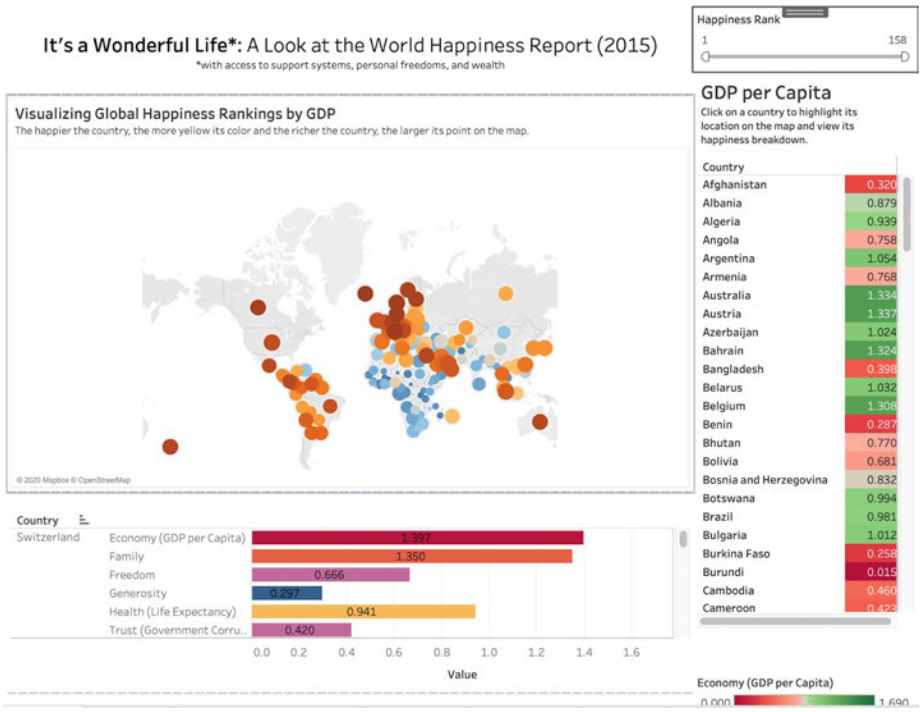

Figure 9: Adjusted the layout of information on the dashboard in different ways to see what looked best

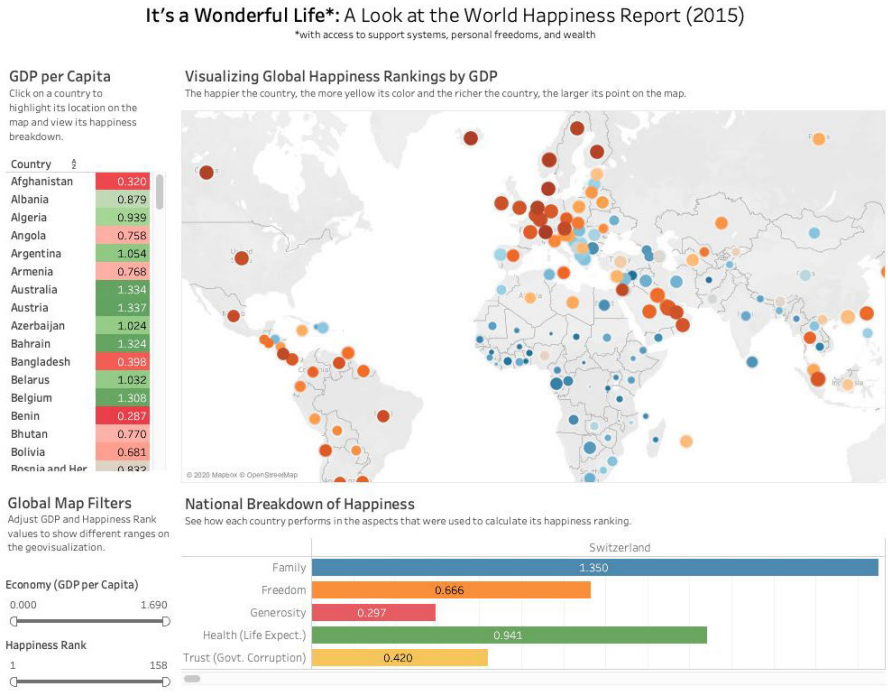

Figure 10: The final design for the visualization before I corrupted my dashboard and had to recreate it from scratch, but couldn't get the same color scheme to apply to the bottom chart like before, sadly

Good Design & Design Principles

User Exploration

Rather than construct a narrative as I did with the infographic, I opted for a dashboard with a more exploratory approach. I created three related visualizations to show aspects of the World Happiness Report dataset. Users can zoom, pan, and hover on the map, as well as control its data points via two filter bars in the lower left corner. I am hoping to achieve Learning Objective 2 by dual encoding the map with GDP and Happiness Rank, so that -- with some examining of data points and adjusting of filters -- the is able to explain the relationship between a country's GDP and its happiness rank. Users are also able to isolate data for a specific country by selecting a point on the map or a row in the GDP table, which will populate the bar chart showing the breakdown of the happiness ranking for the country below the map (Learning Objective 3). All together, exploring the dashboard should allow a user to achieve Learning Objective 1: an ability to compare and contrast how nations across the world fare when assessed by happiness ranking and its attributes.

Filtering

Because this is more of an exploratory visualization, I think it is a good design practice for the user to be able to filter the data based on their preferences. At the same time, I didn't want the user to be able to filter on every possible parameter in every chart. I allowed the user to control the data points on the map via two sliders, which further allows them to explore the relationship between GDP and Happiness Rank across the globe. Also, although the user does need to take an exploratory approach, I also limited this by allowing them to select specific data points on two of the charts, which filters out the rest of the data in the visualization, prompting the user to focus on the details of one country without extra noise.

Labels/Descriptions

Although they are minimal (especially compared to my infographic), the dashboard does have short labels and descriptions for each distinct visualization in order to offer the user some guidance about what they are seeing. This is, hopefully, just enough information to orient the user, but still give them the opportunity to explore and draw their own conclusions. With a larger-sized dashboard, I might consider adding more direction and additional visualizations to take a more narrative approach.

Assessment & Evaluation

In order to evaluate the effectiveness of my infographic, I would (again, as with the static visualization) design a series of controlled experiments in which I give the interactive dashboard to participants, ask them to interact with while finding the answer to a set of questions, in order to evaluate whether my learning objectives have been met.

In my study design, I would include a control group (given the dashboard with no explanation) vs. a test group of students who are primed for the learning objectives by giving them context for the dashboard

before they interact with it. For example, the primed group could either read the article "Why Is Tiny Norway Totally Dominating the Winter Olympics?", or they could be given the infographic I created in response to that article. Then, they would explore the dashboard while having a list of questions to answer from their exploration of the visualization. For example:

1. What trends did you notice among nations that had a low happiness ranking? A high happiness ranking?
2. What, if any, relation does a country's wealth seem to have on its happiness ranking?
3. What are some of the aspects that affect happiness, according to the World Happiness Report's calculations? Do any of these needs seem to have a more significant impact (contributing to either very high or very low happiness rankings) than other needs?