Akshit Bhatnagar Jared Goldsmith Jillian Jarrett February 24, 2018

Exercise 7 Report: Fix a Visualization

Motivation: Many visualizations stray from modern principles, often misleading readers and obfuscating the data they represent. Our aim was to identify problems and shortcomings in two visualizations: Climate Pie Charts and Distribution of Spanish Speakers in the United States. Furthermore, guided by the effectiveness and expressiveness principles, we rendered new visualizations to correct these problems and effectively convey the same data.

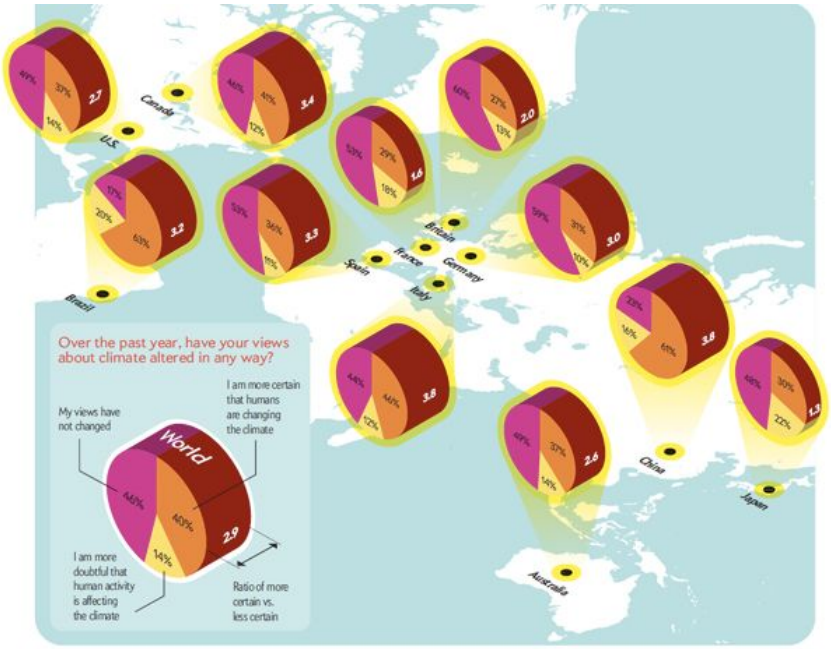
What: The sources for our visualizations were tabular datasets that included several attributes and geographical identifiers.

Attributes & Types

Climate Pie Charts	Country	Categorical
	Certain views percent	Sequential quantitative
	Doubtful views percent	Sequential quantitative
	Unchanged views percent	Sequential quantitative
	Ratio of more/less certain	Sequential quantitative
Spanish Speakers in the United States	State	Categorical
	Percent Hispanic	Sequential quantitative

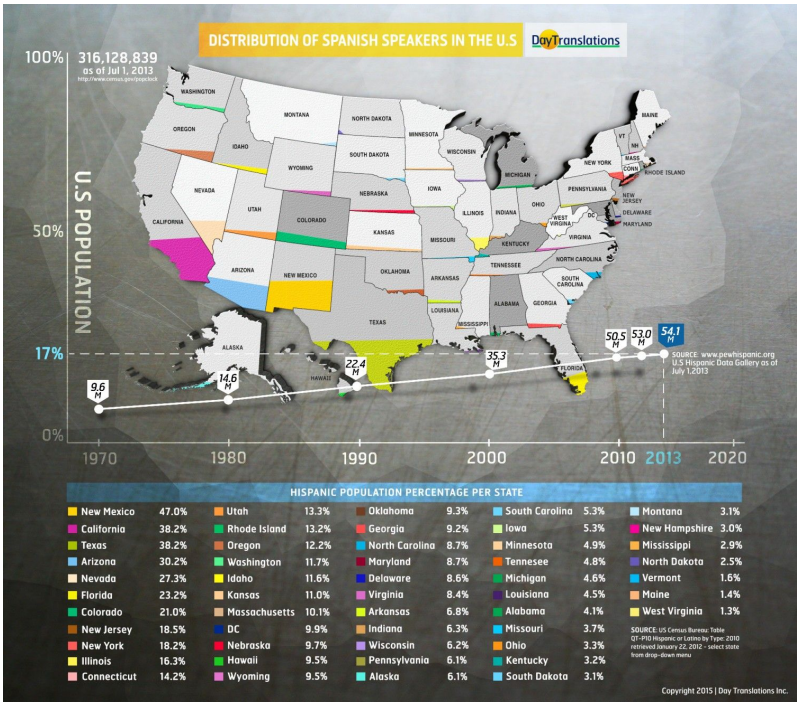
Why: Our initial visualizations had several shortcomings. The channels are not effective for the types of data they are representing.

Climate Pie Charts. Three dimensional graphics are difficult to interpret. Volume, the least effective of the magnitude channels, is used to convey the ratio attribute. The map is hard to read due to the unusual angle and occlusion : the 3d pie charts obscure large parts of the world map.



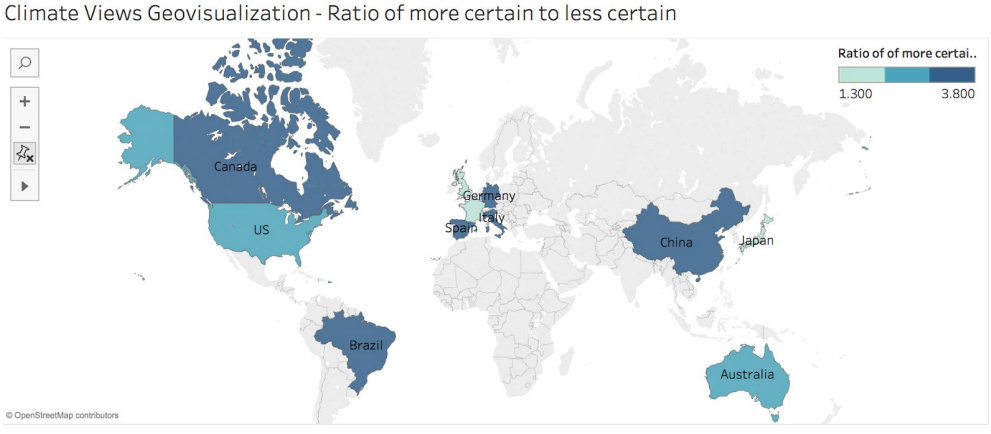
Furthermore, the colors are not colorblind friendly and the similar hues and luminosity (intense pink, red, orange and yellow) are hard for even non-impaired readers to differentiate. The angles are a low expressiveness channel, and this visualization utilizes them twice by situating pie charts at an angled vantage point.

Distribution of Spanish Speakers in the United States. This visualization uses ineffective channels to convey the distribution of spanish speakers in the United States. It uses different area scales (state boundaries) to represent what percent of Spanish speakers comprise its population. It uses a redundant and overwhelming categorical color palette for the state attribute. Its legend more effectively conveys the same information as the geovisualization, making the geoviz ineffectual.

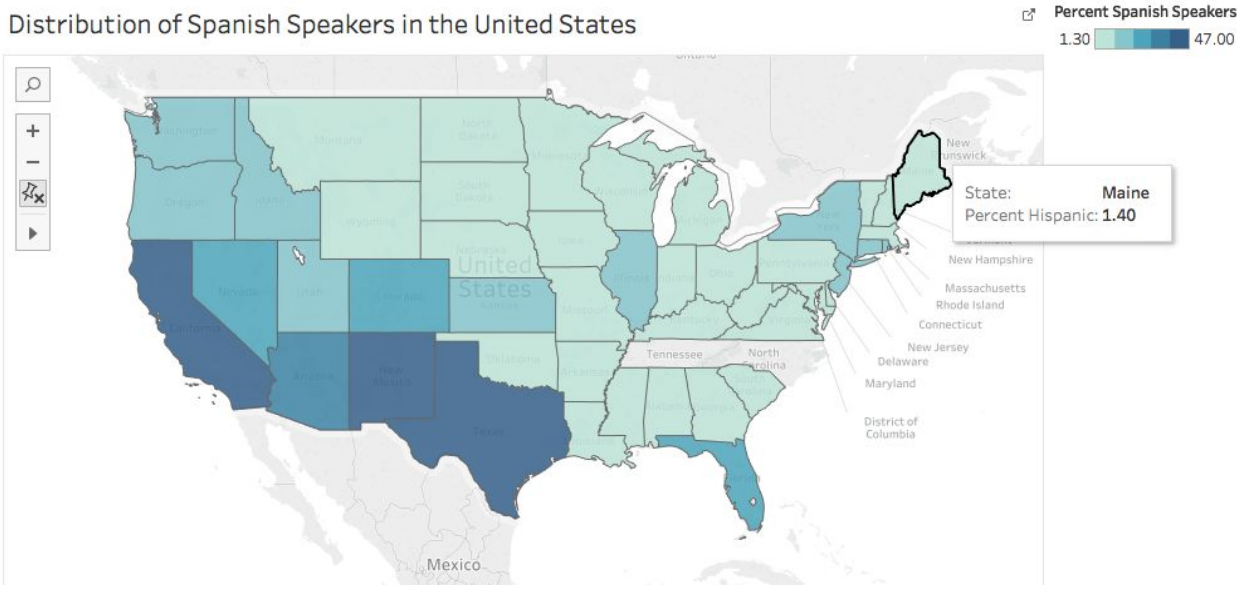


How: We remade these visualizations to more effectively convey the same attributes.

Distribution of Climate Views. We split this visualization into two distinct parts: a pie chart that shows the distribution of climate views within a single country, and a geovisualization to show how views are distributed around the world. For the pie chart, we look at the breakdown of a single country at a time. We used a categorical color palette to distinguish the three different vantage points, and a hover tool (not shown) shows actual values. Rather than bombarding the viewer with multiple pie charts,we've included a dropdown filter to allow viewers to select countries of interest. For comparing views between countries, we've included a world map with a sequential, cb friendly color palette. We've binned the colors for increased discriminability, and opted for three bins to show our 2.5 range of climate view ratios.



Distribution of Spanish Speakers in the United States. This visualization shows the percentage of Spanish speakers in each of the United States. We were unable to display the temporal data because it was not included in the tabular dataset. For the state attribute, we kept a geovisualization with a hover tool that helps users identify states. To show the percent of Spanish speakers in each state, we relied on the color luminance channel. We binned a sequential monochromatic color palette for enhanced readability and ease of comparison among the states. We used 5 bins to distinguish the 45.7 percent range in our data. Again, the hover tools allows users to find the exact metric of any states of measure and helps with any shortcomings with the color palette.



Conclusions: We dissected two visualizations and reimagined them to convey the same data in a more effective manner. We removed elements that are known to be misleading and replaced them with more effective channels. We found there were often design decision tradeoffs that were handled on a contextual basis.