Homework 03 Part 1 **Name: Sanittawan Tan**
Perspectives in Computational Research

Problem Statement

Select a data visualization and write a (roughly) 1000 word critique of the visualization based on the five qualities of great visualizations drawn from Cairo's *The Truthful Art: Data, charts, and maps for communication*

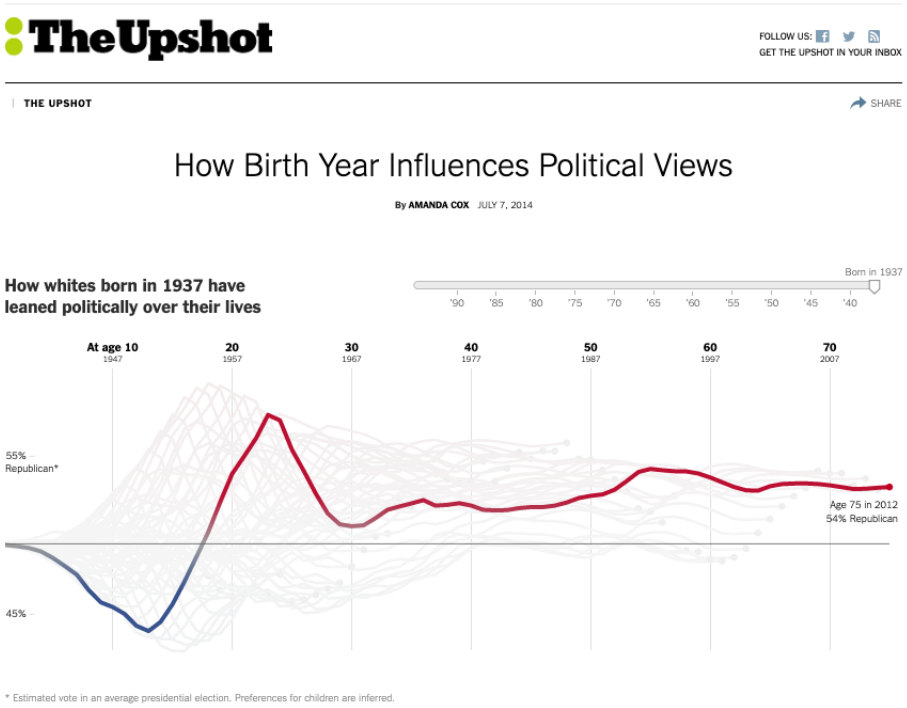
Selected Visualization

Visualization: How Birth Year Influences Political Views by Amanda Cox

Source: The Upshot, *The New York Times*

Link: https://www.nytimes.com/interactive/2014/07/08/upshot/how-the-year-you-were-born-influences-your-politics.html

Figure 1: Selected visualization (main chart)



Critique

Before evaluating the graph based on Cairo's five criteria, I would like to briefly discuss why I intentionally chose this Upshot article which contains one interactive chart and three other static plots. As we will evaluate more closely, I decided to evaluate this article because the main interactive chart is not easy to comprehend at first, but the title instantaneously grabs my attention. The topic also relates to an important social science question. As the chart compresses many information which may not be so straightforward to understand, it makes an ideal candidate for this exercise.

The Upshot article contains a series of charts. The first plot is an interactive plot that shows the political ideological development of white American born in different years inferred from their voting behaviors. For instance, White Americans who were born in 1973 started off supporting Democratic presidential candidates in a higher proportion. As they grew older, the proportion of voters who support Republican candidates increases. The second static plot shows the relative importance of age that contributes to voters' behavior. The third and the fourth static charts are subsets of the first interactive charts. They contrast voting preferences of white Americans who were born in 1941 and 1952.

1. **Is it truthful?**

According to Cairo, truthfulness of a visualization entails clarity and sincerity.[1] I think all the plots included in the Upshot article are truthful. Every plot has a clear title and axis labels. For instance, the interactive chart which plot Republican/Democrat vote shares in presidential elections against the year and age of voters are clear and easy to follow.

However, one minor point that could decrease its truthfulness is the note below the chart which states that voting preferences for children are inferred. This is because the chart actually starts when white voters are 10 years old (though the years of birth annotated under the age change as users move cursor of the "Born in (year)" tab at the top right corner from left to right. I found this part to be strange because I am not sure how much information readers gain from knowing a voter's preference when they cannot actually vote at that age. Moreover, the preferences are inferred, so it is unclear how reliable the inference is.

Although I raise the question about the inference of vote preferences for children, I am aware that these charts are based on an academic paper by Yair Ghitza and Andrew Gelman (2014). The paper is also hyperlinked in the body of the article. Although the article itself does not extensively discuss the data sources beyond Gallup's presidential approval rating, the paper explicitly states the data collection process and all the data sources since the data is retrieved from surveys.

The final minor point is that the title of the article can be slightly misleading since it does not mention that the data is solely on white American voters. One has to look at the interactive chart title to find that information. In this case, the title of the visualization is clearer than the article title in my perspective.

2. **Is it functional?**

Cairo argues that a visualization is functional if it helps readers to interpret them correctly. This means the type of a visualization should be tailored to its audience. The chart may be simple,

[1] Page numbers are omitted here and throughout the write-up because I am referring to the EPUB version of this book which is inconsistent with the physical version.

but it should retain its truthfulness and conveys a clear story. The first interaction plot appears to be overwhelming at first because it has interactive features, notes, and a variety of labels. I believe that readers have to probably spend 2-3 minutes staring at the chart before understanding the message it tries to convey. In fact, I have to scroll down to the last two static plots which pick out white voters born in 1941 and 1952 to begin to grasp what the interactive plot and the article are about. However, once I understood the graph, I believe that the charts in the article are all functional. Firstly, the interactive features are all well-done. When readers move the upper right tab from left to right, one single line which represents the voting preferences over the age of white voters born in a certain year is shown while other lines representing similar information (for different birth years) are greyed out in the background. This design effectively reduces clutter.

Although all the other lines are greyed out, readers can still gain some valuable information from them. Here is my interpretation of the entire chart: regardless of when they were born, one common pattern among white voters arises. The proportion of Republican supporters increase as the age cohort grows older (while the proportion of Democratic candidate voters decreases). Take the age cohort who were born in 1941 (second to last chart), they were supporters of Republican presidential candidates at a much higher proportion when they came of age. As the age cohort grows older, the Republican supporter proportion is still larger than that of the Democrats. In contrast, the age cohort who were born in 1952 started of with a much higher proportion of Democrat candidate supporters. However, as they aged, the proportion of Democrat presidential candidates supporters decreases while that of the Republican increases. Therefore, the key insight from these charts appear to be the fact that the proportion of Republican candidates supporters tend to grow rather than decrease.

A few words about the static chart on the "formative years." This chart is more straightforward and is nicely done. The chart shows that the ages 14 to 24 are the formative years of voters' preferences which could last a lifetime. This is because the relative importance plotted on the y-axis spiked during the period.

In terms of audience, the charts are made for the public although the content is based on an academic research paper. I think that the charts are as accessible to academics as to the public.

3. **Is it beautiful?**

According to Cairo, a visualization is considered beautiful if it is aesthetically pleasing, simple, clear, and elegant. A beautiful visualization does not contain chart junks or things that are note related to the story or do not add value to readers' understanding of the topic. Again, I think the visualization in this article is beautiful. Firstly, the makers use appropriate colors which correspond to partisanship in the interactive graphs. When there are higher proportion of Democrat supporters, the line is painted blue. The opposite is painted red for higher Republican proportion. When the proportions are almost the same, Cox used grey color to distinguish it as well. One minor critique is that she could have used a different line style to indicate the inferred proportion of the data. It is unclear from the chart and the readers like me have to assume that the part of the line before the voting age is inferred, not actual data. What she could have done to distinguish the inferred and actual data is to use the dotted line for the inferred portion of the line and the solid line for the actual data. Apart from this critique, I think the chart maker did well in terms of the use of colors because it is both meaningful and beautiful.

Secondly, the labels are clear and have the appropriate amount. Each of them conveys useful information for readers. My favorite part is the annotated presidential years under the main

interactive graph. I found them to be very helpful because I am incapable of associating calendar years with all the US presidents (I can put US presidents in the right order, but it would take me some time to recall which presidents were in office during which particular years). Additionally, the presidents change when I dragged the tab from younger age cohort to older ones. For example, people who were born in 1992 like me only have only experienced three (now four) US presidents at the time that the article was written.

4. **Is it insightful?**

Cairo posits that there are two kinds of insights: spontaneous and knowledge-building. According to Cairo, the latter insight is much more common in interactive charts which are of our interest. Hence, an insightful visualization should entail either or both insights. As I mentioned earlier, the interactive chart in this Upshot article is difficult to interpret at first. Therefore, it does not lend itself to spontaneous insight. However, once readers have a sense of the visualization, it greatly contributes to our knowledge-building insight.

I believe that readers would walk away from these charts with two insights. First, voting preferences of White Americans changed over time, but we can detect some common patterns (increased proportion of Republican presidential candidate supporters). Some age cohorts started off with much more Democrat supporters while other began with higher proportion of Republican voters. Second, ages 14 to 24 are "political" formative years. Experiences about politics at the earlier stage of life can have a lifetime impression on White Americans voting behavior. As a student of political science, I found these insights to be illuminating, especially the formative years. I expected that the most important formative years would have been around middle age. The chart did show that there is another spike around middle age too, but the relative importance is not as high as the earlier years. It also makes me question how much influence these white American voters receive from their parents since the political formative years seem to happen at the earlier stage in life.

5. **Is it enlightening?**

Cairo states "Great visualizations change people's minds for the better. They are enlightening." He further notes that the fifth criteria is largely impacted by the first four. The final criteria appears to be rather vague, but Cairo admits that some topics matter more than others because they are more critical to people's well-being. Thus, we will use this conceptualization to evaluate the Upshot graphs. As an extension to insights, I believe that the first insight may not be very enlightening. We already know that people's voting preferences do change over time. Therefore, there is really no "wow" moment. Nevertheless, one could argue that the breakdown by age cohort is indeed enlightening because we see the effect of growing up, i.e. spending formative years under Republican or Democrat presidents can greatly impact white Americans' voting preferences over their lifetime. To me (and other readers I hope), the second insight on political formative years is enlightening because it was not what I was expecting.

However, if we were to turn this question to political campaigners, I can see that they would find the visualization very enlightening because they could plan better campaign strategies. For example, a Republican candidate campaign could spend more resources on targeting and mobilizing older voters on the assumption that there are more likely to be Republican candidate supporters.