Gmail

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Data Visualization Effectiveness Profile

Google Forms <forms-receipts-noreply@google.com> Fri, Jan 31, 2020 at 12:33 PM
To: spearman@cmu.edu

Thanks for filling out Data Visualization Effectiveness Profile

Here's what we got from you:

Data Visualization Effectiveness Profile

Reference

Few, Stephen. “Data Visualization Effectiveness Profile,” 2017, 11.
http://www.perceptualedge.com/articles/visual_business_intelligence/data_visualization_effectiveness_profile.pdf

Email address *

spearman@cmu.edu

Your name *

Sarah Pearman

What visualization are you ranking? Provide the title and web-accessible URL. *

"How many texts do teens send and receive on an average day?" https://www.pewinternet.org/wp-content/uploads/sites/9/media/Files/Reports/2012/PIP_Teens_Smartphones_and_Texting.pdf (p. 11)

Usefulness. Is it useful for the intended audience? Does it communicate valuable information?

	1	2	3	4	5	6	7	8	9	10	
Useless	○	○	○	○	○	○	○	◉	○	○	Very useful

Completeness. Does the visualization have everything necessary to make it understandable?

	1	2	3	4	5	6	7	8	9	10	
No relevant data	○	○	○	○	○	○	○	◉	○	○	All relevant data

Perceptibility. Can the reader understand the information with minimal effort? Is the visualization type appropriate? Does it use illogical comparisons?

	1	2	3	4	5	6	7	8	9	10	
Unclear and difficult	○	○	○	◉	○	○	○	○	○	○	Clear and easy

Truthfulness. Is the visualization accurate, reliable and valid? Is it representing what it says it is, and in the most complete and truthful manner? Does it misrepresent the data or make comparisions that aren't correct?

	1	2	3	4	5	6	7	8	9	10	
Innacurate and / or invalid	○	○	○	○	◉	○	○	○	○	○	Accurate and valid

Intuitiveness. Is it easy to understand and clearly communicates the information? If unfamiliar, does it include easy to understand instructions on how to interpret it?

	1	2	3	4	5	6	7	8	9	10	
Unfamiliar, difficult to understand	○	○	○	◉	○	○	○	○	○	○	Familiar, easy to understand

Aesthetics. It is interesting / enjoyable to look at? Is it a good example of what a beautiful data visualization might look like? Is it somewhere in the middle - pleasing but otherwise not distracting to look at?

	1	2	3	4	5	6	7	8	9	10	
Ugly	○	○	○	○	◉	○	○	○	○	○	Beautiful

Engagement. Does it lead the audience to learn more about the topic? Does it inspire the audience to talk about the data or share it with others?

	1	2	3	4	5	6	7	8	9	10	
Distracts from data	○	○	○	○	◉	○	○	○	○	○	Draws one into the data

Describe your overall observations about the data visualization here. What stood out to you? What did you find worked really well? What didn't? What, if anything, would you do differently? *

My primary complaint about this visualization is the top labels on the bars, along with the not-so-obvious caption indicating what those numbers and the y-axis represent. The first things I saw when I looked at this were (1) the title (so I knew I was looking for numbers of texts sent by teens) and (2) the bars and their top labels. Since I was looking for a representation of "numbers of texts," I initially assumed that the numbers at the tops of the bars were numbers of texts, and it took me much longer than it should have to realize that the y-axis and the labels on tops of the bars were actually percentages of teen cell owners, while the *x*-axis was buckets of text numbers.
I also find it misleading that the y-axis, which represents a percentage, is truncated at 25. I understand why this is done with the way the data is grouped here, since the highest percentage shown is 22%, but I think I would prefer to group the data differently to avoid needing to truncate the axis to get rid of blank space. This data could probably be represented as a stacked bar graph or something along those lines to better show the relationships between the percentages of the whole.
There are also some other minor complaints with the design of this graph, such as some unnecessary grid lines.
On the other hand, this graph handles color reasonably well (nothing too distracting), and the use of a vertical bar graph and the grouping of the bars make it easy to compare 2009 to 2011 since the bars are right next to each other.
My main goal will be to resolve the ambiguity of the labels on top of the bars. I'm not sure if this will be as simple as changing the labeling (maybe adding "%" to the labels, and moving the y-axis caption to be more obvious) or if it will be better to restructure this graph altogether with different arrangement of the axes (e.g. maybe swapped, maybe making the bar graph horizontal) and/or different grouping of the bars (e.g. maybe a stacked bar graph). I'll iterate and get feedback to figure out what works best.

Who is the primary audience for this tool? Do you think this visualization is effective for reaching that audience? Why or why not? *

I don't have data on who exactly tends to view Pew Research data, but my perception is that the audience is probably fairly broad: i.e., the data is accessed by researchers such as myself, but it's also publicly available and addresses topics relevant to the general population of the United States, so it's not entirely an expert audience. I think this visualization will be misleading for most casual readers, even if they are experts, because of how the eye will naturally travel and what assumptions the reader will be likely to make first. If someone doesn't spend a long time looking at this graph, it seems likely that they will leave with some confusion about the numbers it's representing.

Final thoughts: how successful what this method at evaluating the data visualization you selected? Are there measures you feel are missing or not being captured here? What would you change? Provide 1-2 recommendations (color, type of visualization, layout, etc.) *

I think a method like this would benefit from having a component such as "structure," which sort of combines "type of visualization" and "grouping of data"—i.e., does the grouping in your data offer an intuitive and accurate representation of the real-world nature of these data points (or have you tried to use a pie chart for continuous data and a line graph for categorical data)? I also wonder if an evaluation method should include a component like "accurate first impression": I guess this is similar to "perceptibility," but whether you can come to understand the graph after staring at it even briefly to evaluate it is not the same as "do I immediately start making the right impressions from my very first glance at the most obvious visual elements of this graph" (or is there some first impression I have to correct to understand the graph).
