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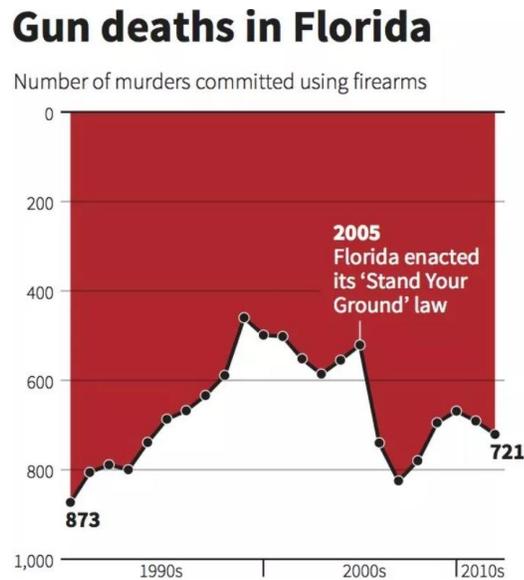April 25, 2022

MISINFOGRAPHICS AND THE DANGERS THEY POSE

By Savannah Chess

COLLEGE STATION, Texas -- Infographics are hugely important to businesses and news organizations to help their audiences visualize concepts, but many of them lead to problems of mis and disinformation spreading through inaccurately displayed data, coining the term misinfographic.

Misinfographics are defined as infographics with false or misleading information, sometimes being classified as forgery when they borrow an existing organization's brand aesthetic and logo to make it seem as though the content was coming from them, according to The Media Manipulation Casebook. A group of five senior journalism students at the University of Texas A&M were asked to analyze three separate graphs portraying misinformation and determine what tactics were used to fit the intended narratives.

The first graph shown is from the Florida Department of Law Enforcement and reports how the number of deaths in the state were affected by Florida's "stand your ground law," according to Live Science. Audiences are accustomed to viewing numbers that increase vertically in a chart and since the y-axis on this chart decreases vertically, it is an example of being intentionally misleading, according to Blue Health Intelligence. By deviating from the norm, confusion and misinterpretation of the facts when taken at a glance can occur more easily,

according to Blue Health Intelligence. Of the five students, only one could depict the problem with the following graph.

Gun deaths in Florida
Number of murders committed using firearms

2005
Florida enacted
its 'Stand Your
Ground' law

873

721

Nathan Varnell, senior journalism student and editor for The Battalion, was the only student to correctly identify the misinformation in each graph, however he said that the graph above was the one that gave him the most trouble.

"If I had just glanced at it without actually really caring what it was trying to say, it could've slipped by me," said Varnell.

Garrett Page, senior journalism student, said he doesn't usually pay close attention to the formatting of infographics when he sees them in the news or on social media. This graph made him aware of how easy it is to spread misinformation when readers are scrolling quickly, he said. Page said he now plans on paying more attention to the details of these infographics in the future.

"I didn't notice at all that the y-axis was flipped upside down," said Page. "To me, my brain was just like 'oh gun deaths declined,' and I didn't think to, like, look to see if it needed to be flipped."

Manipulation of the y-axis to create misleading graphics is very common and is used to blow out the scale of a graph to minimize or maximize change, according to Library Research Service. In this graph the method of exaggerated scaling was used, which, in line charts, is notoriously simple to skew in favor of the creator's narrative, according to Blue Health Intelligence. Blowing out the y-axis in this representation of global warming since 1880 causes the graph to indicate relatively no change over time, when in reality if the scale is minimized, there is a more factual representation, according to Blue Health Intelligence. By narrowing in on the y-axis value, a more precise visualization is given so that the message can be readily and more accurately understood, according to Blue Health Intelligence. Of the senior journalism students interviewed, three out of five of them were able to identify this problem in the graph below.
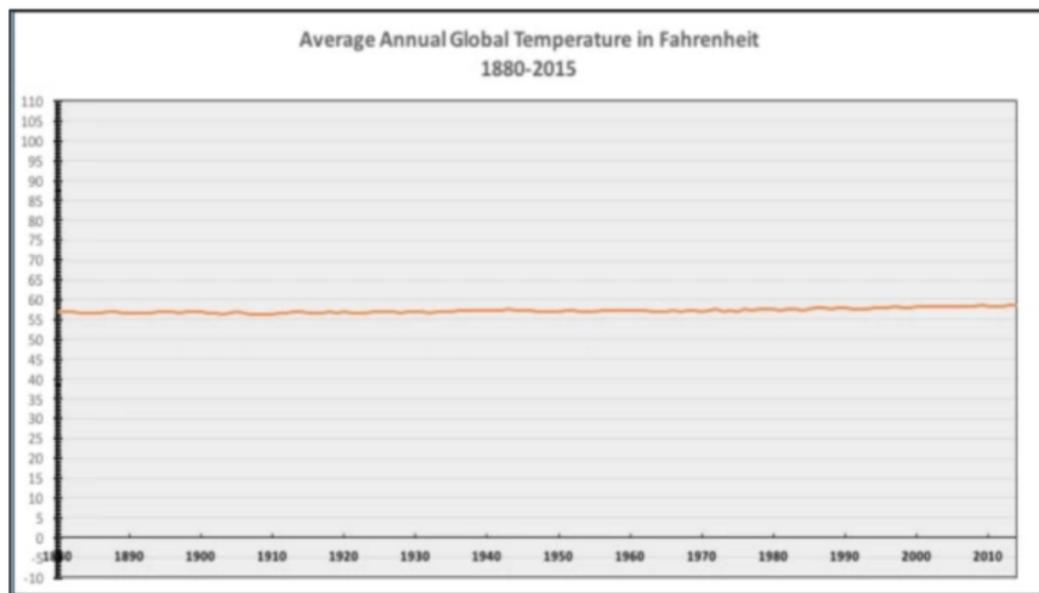

While the scale range consists of plausible temperatures in Fahrenheit, it is not sensible to use this wide of a range for the dataset, according to Library Research Service. The use of this scale serves to flatten the line to fit their narrative that the average annual global temperatures

have not changed in the last 135 years, while the graph below portrays the data with a more meaningful y-axis, according to Library Research Service.

Varnell said this was an easier error for him to spot as he has spent a lot of time studying climate change during his undergrad and understands that temperatures only need to fluctuate a little to be significant.

"A lot of global temperature changes only range like one to two degrees and this is showing like a full thermometer worth," said Varnell.

The following graph shows what the data would look like with a more meaningful y-axis, helping to show the upward trend more clearly, according to Library Research Services.
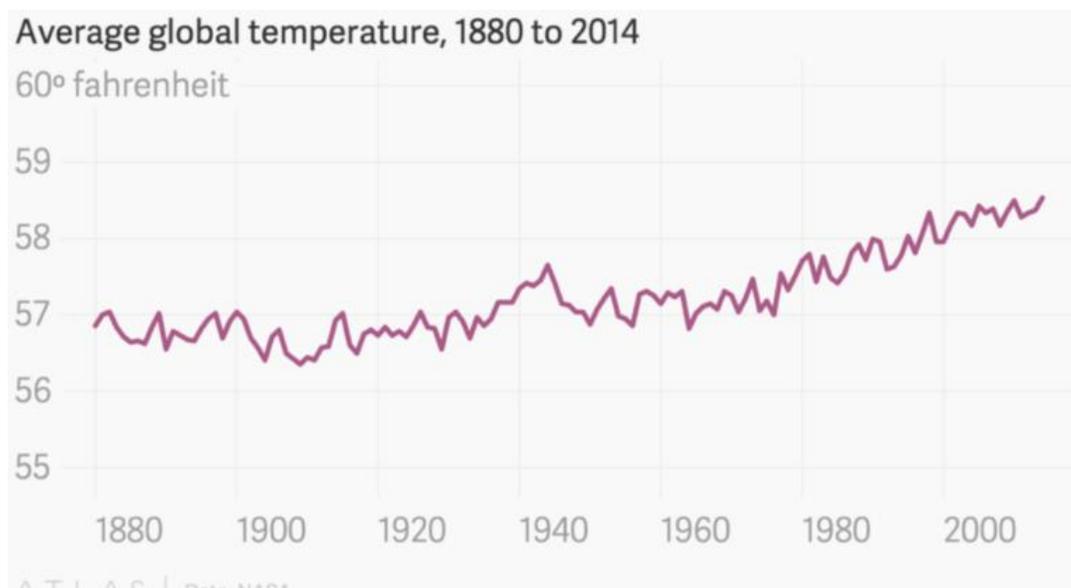
The students were then asked to analyze a graph published in Georgia by the Department of Public Health depicting COVID cases decline over time in the most severely affected counties. However, instead of arranging the data in chronological order and remaining consistent in the order of the bars, it was in non-chronological, descending order, according to AP News. Inaccurate data visualization is no small error and can have profound repercussions as they can

lead audiences to an inaccurate understanding of data and faulty insight, according to Harvard Business School.
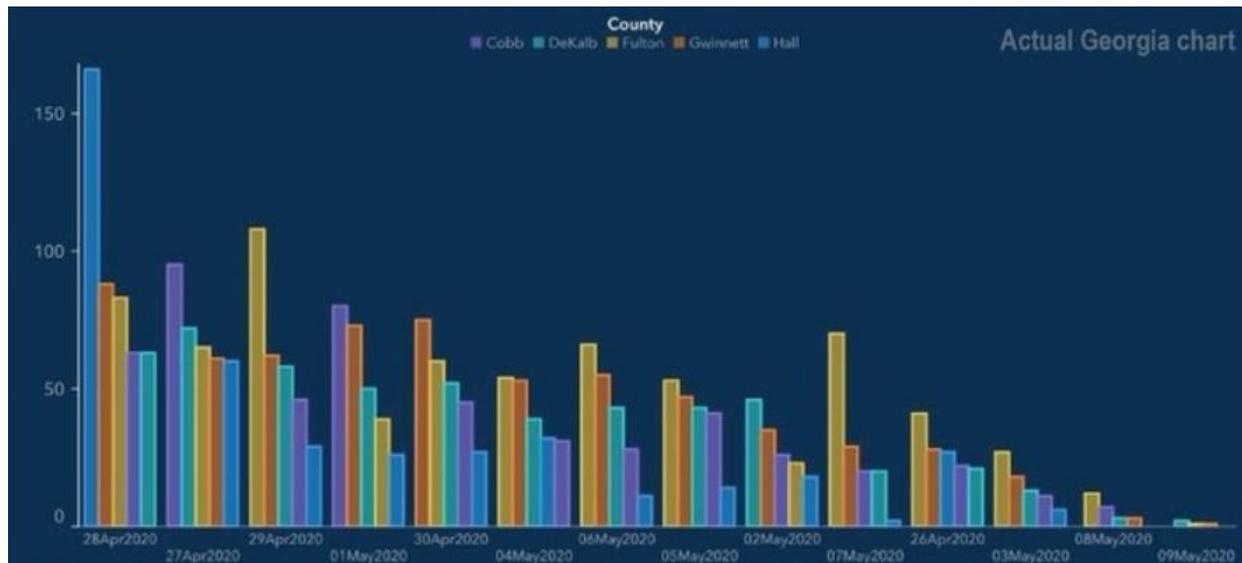

This graph makes the data appear as though the decline in cases was smoother than it was by putting the x-axis in non-chronological order, according to AP News. It is difficult to look at this graph and understand what is going on, said Varnell.

"I definitely can't make sense of time frame here and it's just confusing to look at in general," said Varnell.

Claire Otto, senior pursuing a journalism minor, said she realized the error of inconsistency with the order of the counties for each cluster, but could not figure out what else was wrong.

"I wouldn't have even looked at the x-axis until you told me to because you just assume that it's going to be correct," said Otto.

The bar graph below was recreated by the Associated Press with the same data in chronological order, showing that the daily cases actually spiked the first week of May.
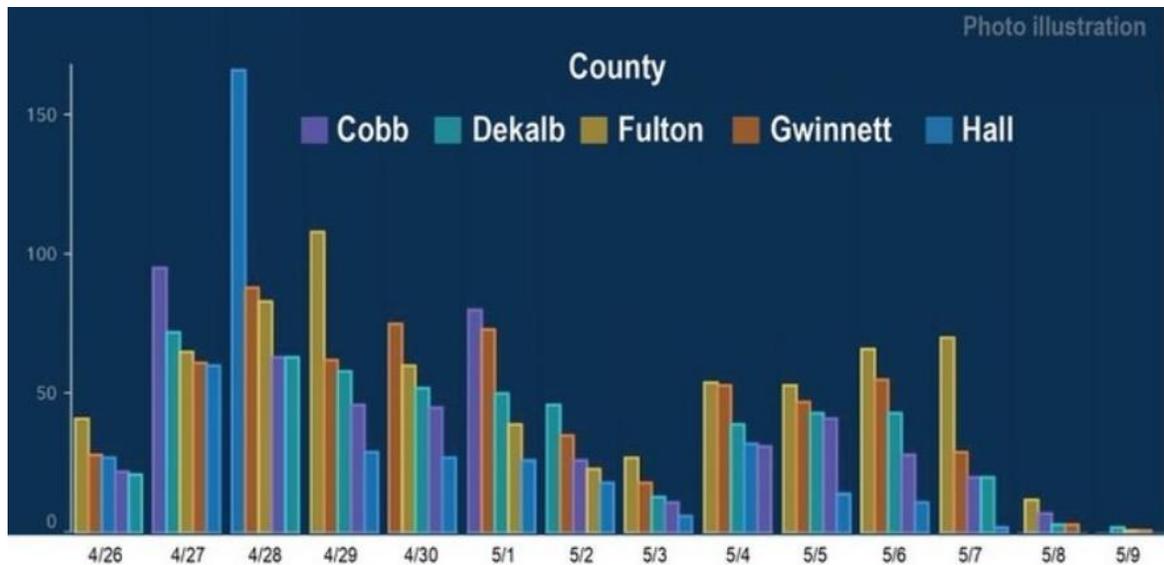
With all five of these students graduating soon with a major or minor in journalism, many of them said they were surprised by how difficult it was to spot the misinformation in these three graphs. Natalie Warrick, journalism student, said she was embarrassed about not finding the errors on her own. Warrick said that throughout the pandemic she would frequently see viral infographics about covid on multiple social media platforms that would fit a particular person or group's narrative. With the amount of misinformation that she sees on social media, she said she feels like her trust has been broken.

"You always have to do the research yourself, and I definitely do that," Warrick said. "I try to get my friends and family to do that but it's harder because they're just like, entrenched in one view, and it's like, just because you see it on Facebook doesn't mean it's true."

There are five common downfalls of data visualization, according to Blue Health Intelligence. The first, and one of the most common, is truncated graphs where the y-axis begins with an arbitrary number instead of 0, creating the impression that there is a significant

difference between data points when there isn't, according to Blue Health Intelligence. Another is improper extraction, which is where the graph only uses a portion of the data that aligns with a particular narrative rather than looking at the full story, according to Blue Health Intelligence. Too much pie is found when the sum of each slice doesn't add up to a whole, either due to sloppy mathematics or an intentional representation, according to Blue Health Intelligence. Then there's exaggerated scaling and going against the norm, as mentioned in the example infographics the students were shown. However, according to Harvard Business School there is another common way of creating misleading data, poor color choices. Using too many colors, red and green in surprising ways, or colors with little contrast can cause significant confusion for readers, according to Harvard Business School. Journalism students are taught the importance of analyzing these graphics and determining if the source is trustworthy before promoting it, said Otto.

"Even if we're young we still have to look at those things because it could be important for social media purposes, like what you post and repost," Otto said. "I think that's important."

Another problem with these infographics is the speed in which they can spread. Whether those reposting them have good intentions or not, platforms such as Instagram do not monitor their accounts in the same way mainstream media fact-checks their work, according to Daily Trojan. Flagging certain posts is when Varnell said he is most likely to pay attention to a graphic containing misinformation.

"I think I pay the most attention to how something is formatted if it comes up on my timeline when other people are already calling it out," said Varnell. "You know when other people are pointing it out, like, this is messed up for whatever reason."

Journalism student Marco Mireles said that after viewing these misinfographics he wants to pay more attention to the information that he is looking at.

"There's just a bunch of small details that normally I would brush over and wouldn't really ever think would be skewed, or kind of misleading," said Mireles. "But now, you know, I feel like my trust has gone down a little."

After studying journalism for the past four years, Page said he now puts more thought into questioning the news he sees on social media, finding out who wrote it and what news outlet is promoting it, as well as if it's reliable.

"It's still something that I definitely need to continue to work on and like, check the sources that I'm reading and stories that I'm reading," said Page. "But it's something that I'm definitely a lot more conscious of now."

Mireles said that he thinks social media has made it easy to post an article and make something look more credible than it is, so he focuses on getting his news from sources he deems credible rather than random accounts on the internet. For example, accounts like @so.informed, with almost three million Instagram followers, are known to help inform people on topics so that they are more willing to take action on, but it is unapologetically partisan, according to Daily Trojan. Because it openly skews to one side of the political spectrum and condenses information into infographics, users should fact-check the information before reposting and potentially spreading misinformation, according to Daily Trojan. When trying to determine if a source is credible, Mireles said it's important to really look into their account.

"Whenever I'm browsing online, say I'm on Instagram or TikTok, I would just recommend looking at the different accounts," said Mireles. "Go to their profile and see what other types of things they've posted in the past. And if they have a website linked, you can go to

their 'About' page. Just look through the information that they have on there and check their background and their history. I guess from there it's kind of up to you to make a decision on if you think they're credible or not."

Word Count: 1818

Sources

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