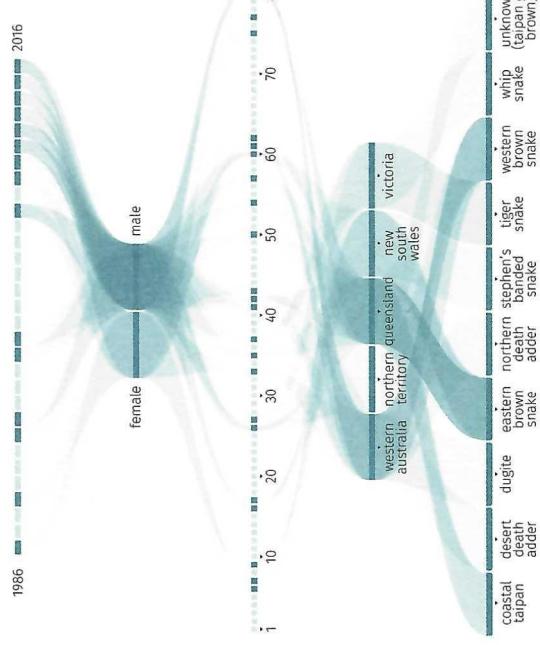


**IF YOU FIND YOURSELF using text captions to explain parts of your visual, or if your audience asks you to explain how a chart is structured, or if—as happens to me sometimes—someone looks at your chart and blurts out, *What exactly am I looking at?* then the chart isn't clear. A clear chart communicates its ideas with little or no intervention. It stands on its own and sometimes produces what one data scientist (now an executive with the San Antonio Spurs) calls a “bliss point”—a moment when we feel we *get it*, instantly and without thinking.**

That feeling is different from the one we get from eye candy—really pretty charts with gorgeous color schemes, curvy forms, and a multitude of data. Those are captivating but may or may not generate insight. Bliss points produce a flash of instant understanding. They don't even have to be pretty. Compare:

**Eye candy:**

## SNAKE BITES IN AUSTRALIA

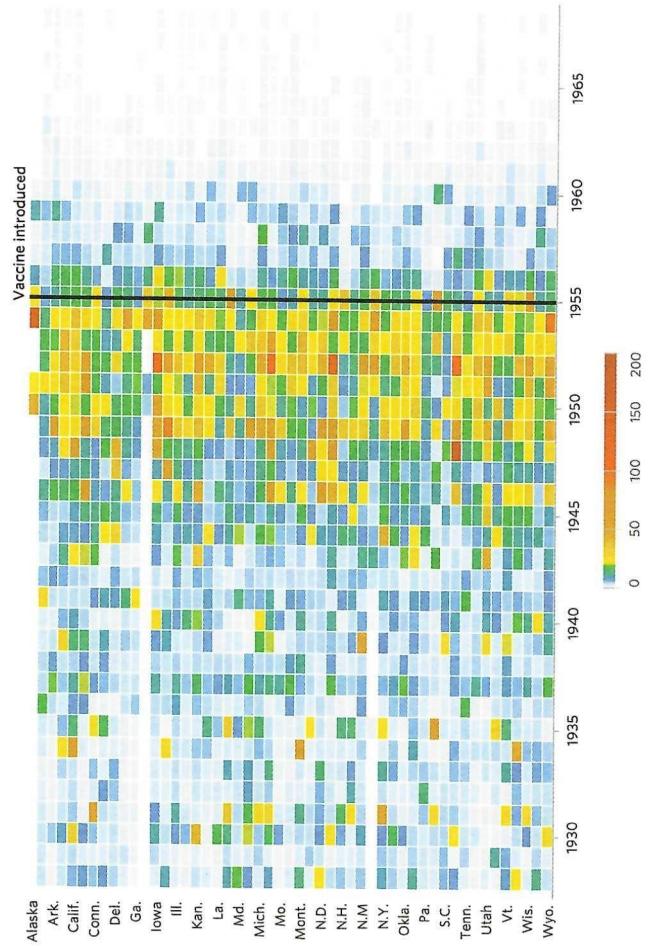


BY MATT GOULD, CC BY-SA 4.0, [HTTPS://COMMONS.WIKIMEDIA.ORG/W/INDEX.PHP?CURID=58876507](https://commons.wikimedia.org/w/index.php?curid=58876507).

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## Bliss point: **POLIO**



REPUBLISHED WITH PERMISSION OF DOW JONES INC., FROM WSJ.COM, "BATTLING INFECTIOUS DISEASES IN THE 20TH CENTURY: THE IMPACT OF VACCINES"  
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The first chart is gorgeous but takes work to figure out. It's unclear how the twisting bands function beyond grabbing our attention. They make it harder to get to the meaning. The idea in the second chart hits us almost as soon as we see it. That's what you're aiming for.

Sometimes simplicity helps achieve clarity, but simple things aren't always clear, and clear things don't have to be simple. To achieve clarity, to get to those bliss points, requires more than nice colors and sparse, simple designs. Every mark on a chart that requires the audience to stop and consider, to make decisions about where to focus,

to challenge how they normally think, works against clarity. Use these guidelines to achieve a clear design.

**1 Take stuff away.** Think about every mark on your chart and ask, *Is this necessary to make my point?* Often extraneous axis labels and distracting grid lines, for example, which are generated automatically by chart-making programs, get left in. Unnecessary color can pull attention away from the core idea. Be aggressive. Even try to delete variables altogether if you think you can make your point without them.

**2 Remove redundancy.** A headline that reads “Sales vs. Revenue” just repeats the axis labels. Captions that simply describe what the visual shows add no insight. Axes representing dollars or percentages don’t need \$ or % repeated on every label. Look for places in your dataviz where information is repeated and take as much as you can off the page while maintaining clarity.

**3 Limit color and eye travel.** Color is powerful—and distracting. If eye-catching colors are assigned to noncore elements, they’ll fight for attention. Think of color as a fraction that needs to be reduced. You want to show  $\frac{2}{3}$ , not  $\frac{12}{18}$ . Do this by grouping variables and using gray for contextual, secondary information. Keys, legends, and captions with pointers force eye travel. It may seem trivial to have to look to the right corner for the key and then back to the visual, repeating the process three or four times, but it’s not. Darting back and forth, or following long lines to labels, slows down chart reading significantly. The farther the information is from what it references, the longer the trek for the eyes. Keep labels and captions close to the parts of the visual they reference. In line charts I like to put labels at the ends of the lines they represent; they make a natural stopping point for eyes scanning the visual, and they remove the need for a key.

**4 Know how people think.** The brain works on heuristics. It takes shortcuts. In our minds, the future always comes *after* the present—to the right of it. Values go *up*, with higher values *above* lower ones. In general red means *hot* or *danger* or *bad*, while blue is *cool* or *water*, and green is *good* or *safe*. When you design *against* such neurological conventions, viewers must work hard to get past it. Imagine trying to read a timeline from right to left, or a y-axis with 0 at the top and 100% at the bottom. Respect convention—and take

advantage of it. If a trend is worrisome, make it red. Put a higher value literally higher than others on your chart. Put North up and South down.

## 5

**Describe ideas, not structure.** Use text, headlines, captions, and other visual markers to highlight ideas or insights rather than to describe the visualization's architecture.

Headlines that reiterate the form don't help the audience as much as ones that hint at or explicitly state why the visual exists. Compare, for example, "Distribution of Spending on Health Care and Wellness" with "More Spending Doesn't Increase Wellness." Or "Trend Line of Median Operating Losses by Year" with "Losses Are Mounting."

## 6

**Bonus pro tip: Align everything.** This simple guideline is supremely effective at creating visual order. The sense of clutter and murkiness that some charts produce comes in part from the way items float independently throughout the visual space. Axis labels are centered on their axes and tilted. Captions hover wherever there happens to be white space. Use the y-axis as a left alignment, establish a second point with which to align captions and other labels, and the cluttered feeling will disappear.

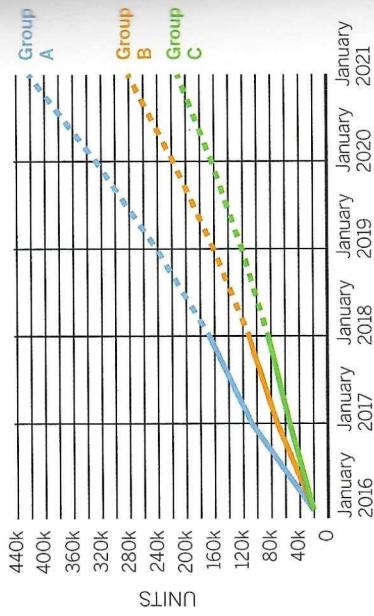
Clarity isn't easy, and it takes courage. Chart makers tend to stuff everything they have into their visuals—variables, labels, colors. Maybe they're not sure what the central idea is; maybe they want all the data there to show the boss how busy they are. It may be comforting to the chart makers, but it makes their visualizations inaccessible or, worse, impenetrable for users. Presenting a clear chart that says one thing well may discomfit you at first, but your audience will appreciate it.

The following challenges are intended to improve clarity. Focus mostly on ways to remove confusion and clutter, using the prompts with each chart. Don't worry about forms, and think about color, labels, standard conventions, and other considerations only as they relate to creating clarity.

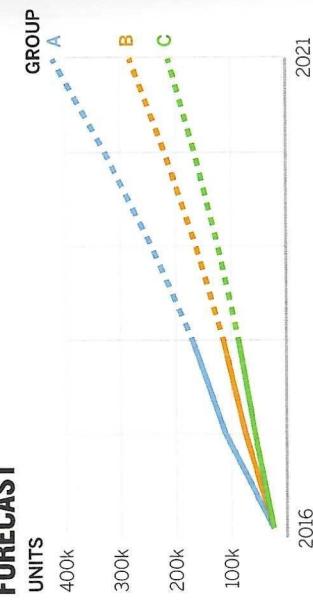
## CRAFTING FOR CLARITY WARM-UP

1. You want to use a line chart to show the year-to-year trend in three forecasts. Which grid creates the clearest experience for that context?

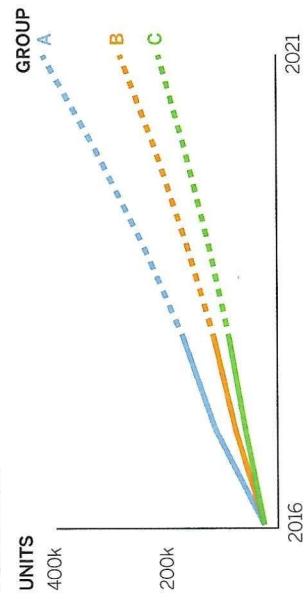
A FORECAST



B FORECAST



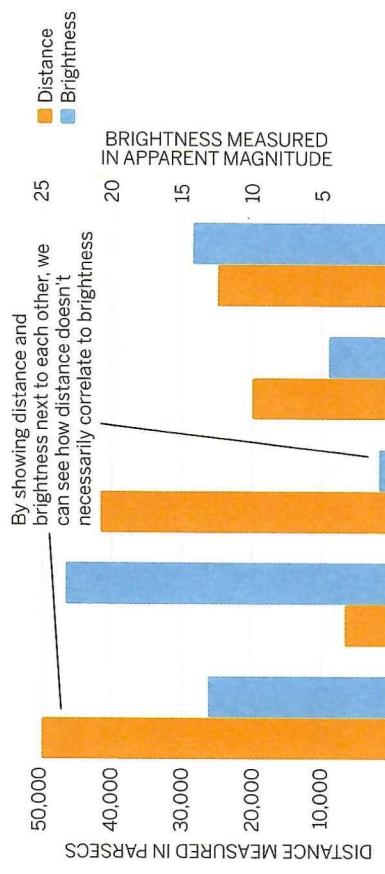
C FORECAST



## MEASURING THE DISTANCE AND BRIGHTNESS OF NEARBY GALAXIES

2. Find a common element in the following bar charts that makes both unclear. Find one element in each that makes it uniquely unclear.

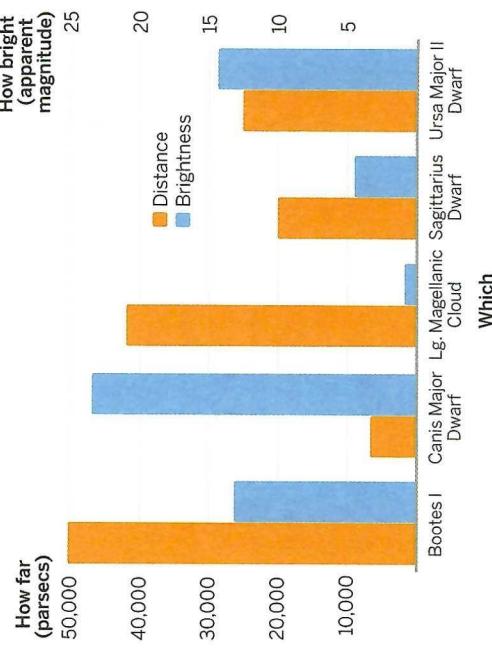
Distance in parsecs is shown on the left side, and brightness in apparent magnitude is shown on the right.



By showing distance and brightness next to each other, we can see how distance doesn't necessarily correlate to brightness.

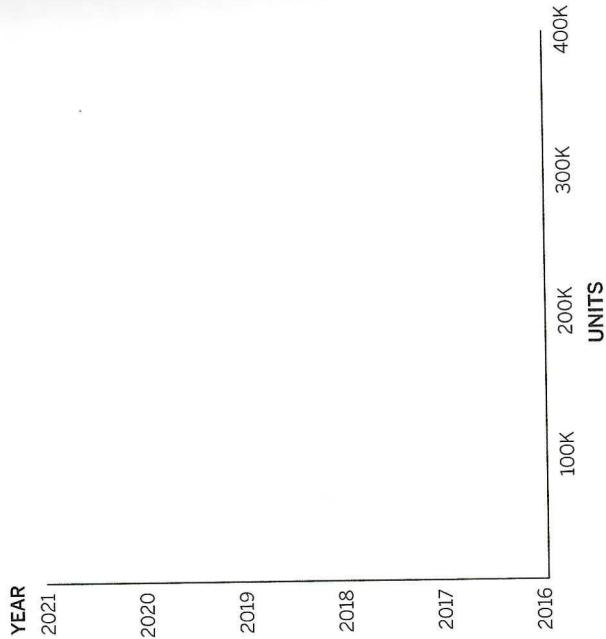
## DISTANCE AND BRIGHTNESS

They vary by galaxy.



3. True or false: To make a chart clearer, you should always remove as many things from the visualization as you can.

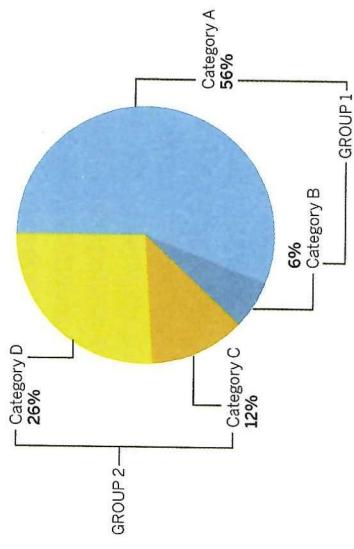
4. Will a data visualization plotted on these axes be clear? Why?



5. In a scatter plot you want to plot average health care spending against average life expectancy for several countries. The plot will show a positive correlation across all countries except one: the United States, which spends the most but achieves only a middle-to-low life expectancy. Which headline would you choose for clarity?

- A** Health Care Spending vs. Life Expectancy for Several Countries  
**B** Investing in Health Care Works—Nearly Everywhere  
**C** Countries That Spend More on Health Care Live Longer  
**D** What Does Health Care Spending Tell Us About Life Expectancy?

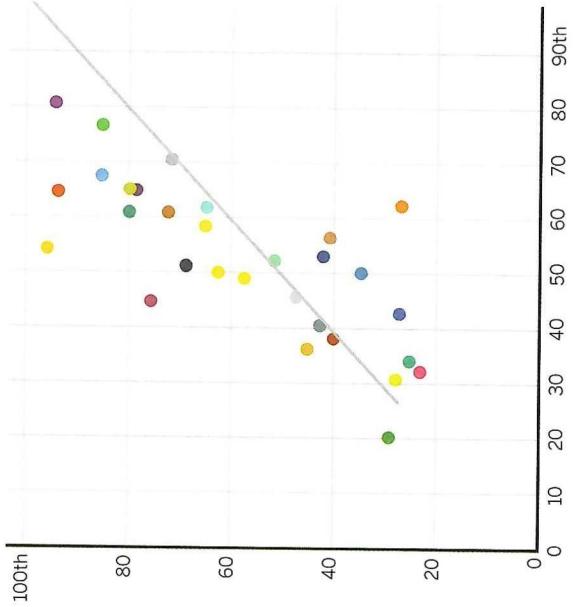
6. What makes this pie chart less clear than it could be? How would you fix it?



7. You want to show customers' relative happiness or anger by region on a map. Which color scheme will be clearest?

- A Happy
- B Happy
- C Happy

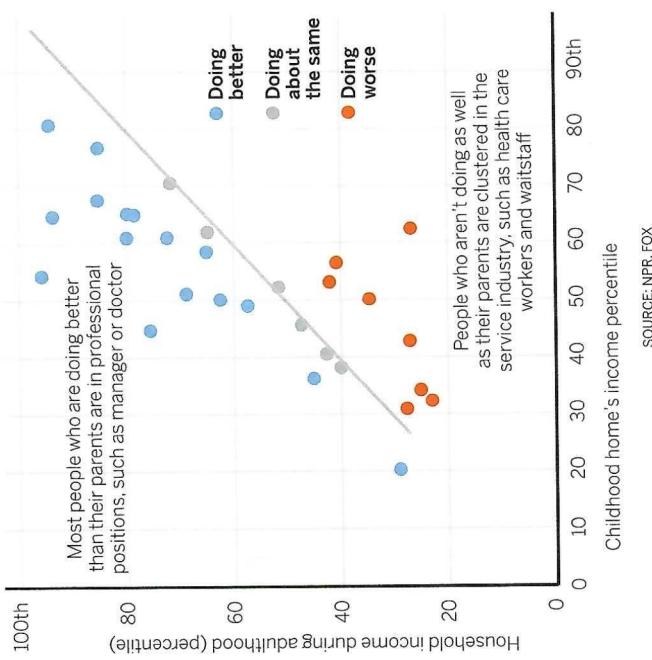
8. Without knowing what this scatter plot is about, what in the visual field would you attack first to improve its clarity?



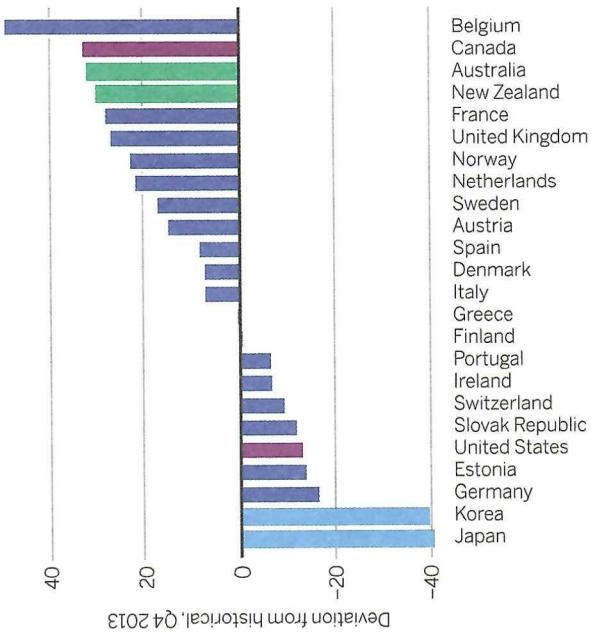
9. Here is an expansion of the same scatter plot made less clear by the number of alignment points. Mark all the horizontal and vertical alignment points.

10. After improving the chart's alignment, find other ways to make it clearer and sketch a new version.

## HOUSEHOLD INCOME DURING CHILDHOOD VS. INCOME DURING ADULTHOOD



## HOUSE PRICES AND INCOME AROUND THE WORLD



## THE SIMPLE, UNCLEAR BAR CHART

It's tempting to think that a chart with ample white space, few words, and a clean design will be clear, but it might not be. In general, simplicity leads to clarity, but sometimes less is less. Simplicity fails when we're forced to stop and think about what we're looking at. If the audience is asking for information that's not there, the chart is probably too simple. Missing or confusing labels, visual elements that draw the eye without explanation, and clever but obtuse headlines are some of the ways simplicity can go awry, as it has here. Let's work on it.

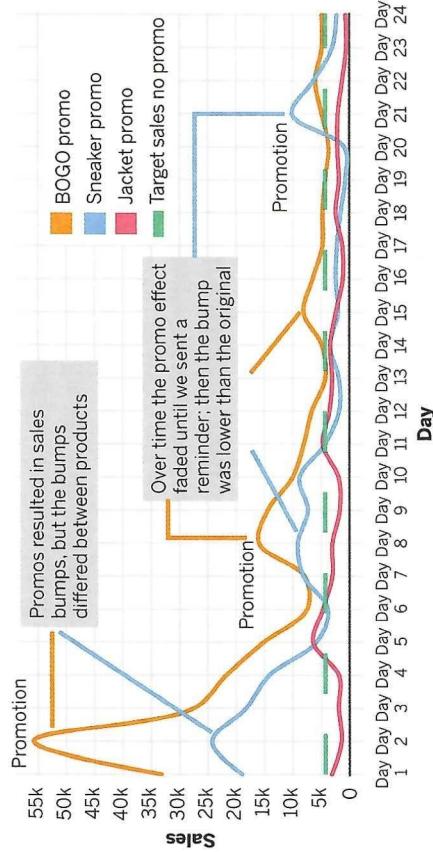
1. Identify four elements of this chart that contribute to a lack of clarity.
2. Sketch a new version of it given the following contextual information:

- a. The y-axis shows a percentage deviation from the historical average ratio of house price to income during the fourth quarter of 2013.
- b. Large positive deviations from historical averages may signal a housing bubble.

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(sketch space)

## STORE PROMOTIONS AND SALES OVER TWO-PLUS WEEKS



## THE OVERDONE LINE CHART

I wish this kind of chart were less common than it is. It seems to pop up especially when the goal is to show viewers not just the data but also an analysis of it. When it comes time to provide the takeaway, the chart maker seems to lose trust in the visual and fill it with words and marks to ensure that the audience knows where to look to see the analysis. Unfortunately, all the words and marks here don't create clarity; they leach it out. We don't know whether we should be looking or reading, and with all those places to focus, it's unclear where to start. Let's work on it.

1. Identify at least two instances of redundancy and say how you'd eliminate them.
2. Identify at least three more elements that make the chart less clear than it could be.
3. Sketch a clearer version that maintains focus on all three variables. Assume that the y-axis refers to dollars. Assume that the promo schedule is as follows:

Day 1: Original promo  
Day 5: Follow-up email 1  
Day 14: Follow-up email 2  
Day 20: Last-chance email

4. Sketch a version of this chart that focuses clearly on a comparison of sneaker and jacket promotions.
5. Sketch a version that shows the “valuable” promotion period versus the “costly” promotion period (assuming that your analysis showed that promotional activities after 12 days were not cost-beneficial).

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(sketch space)