

Visualizing Data

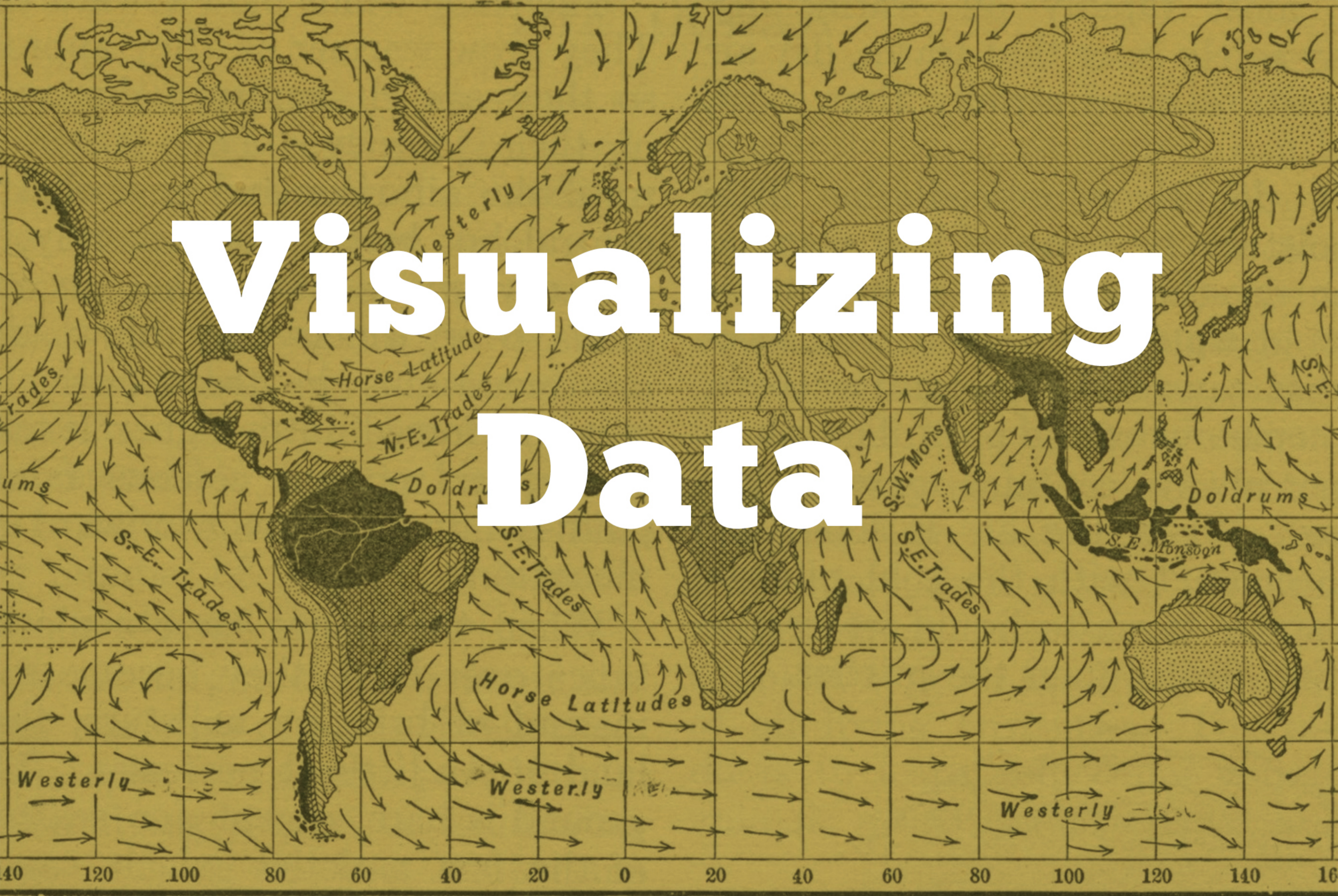
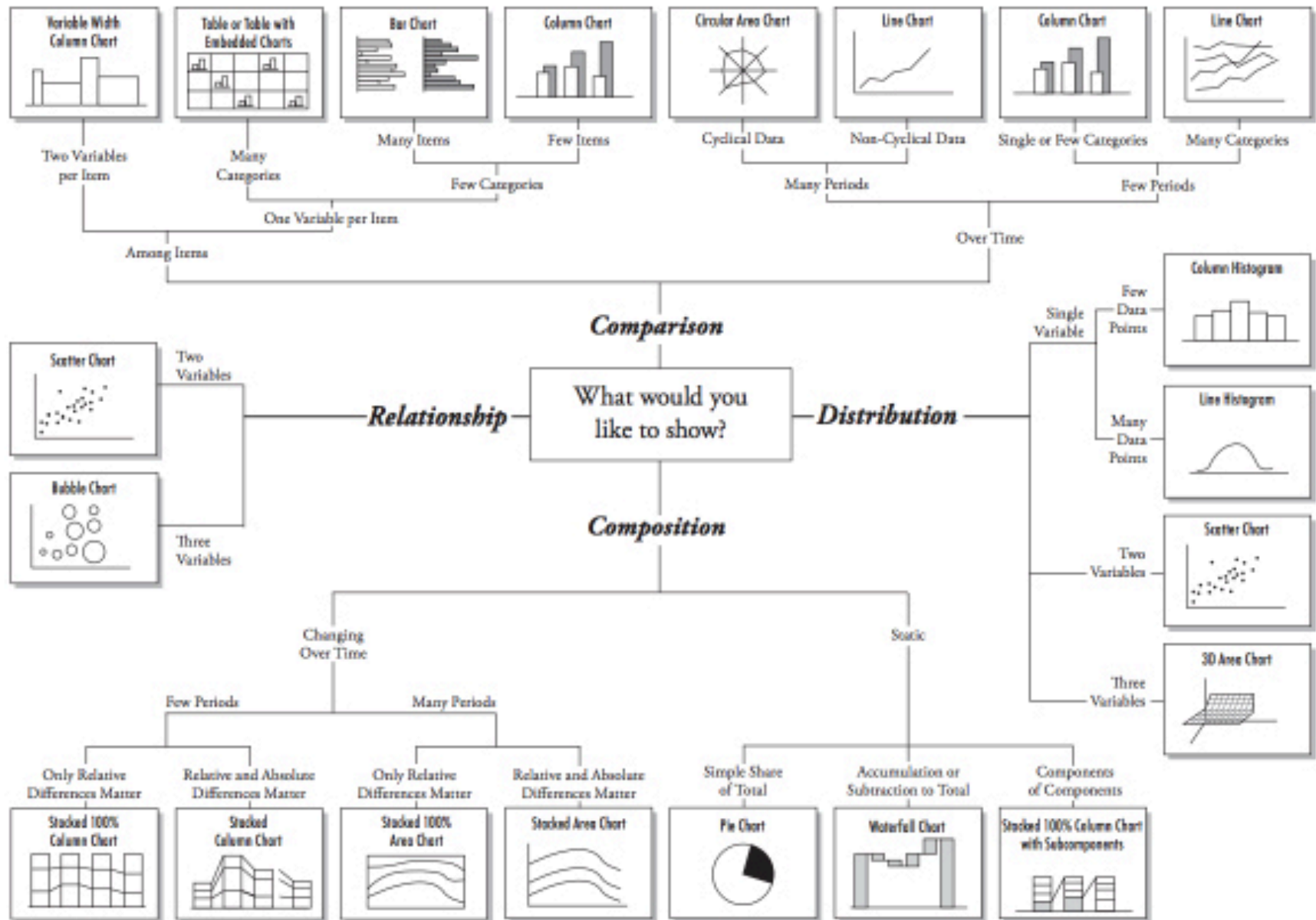
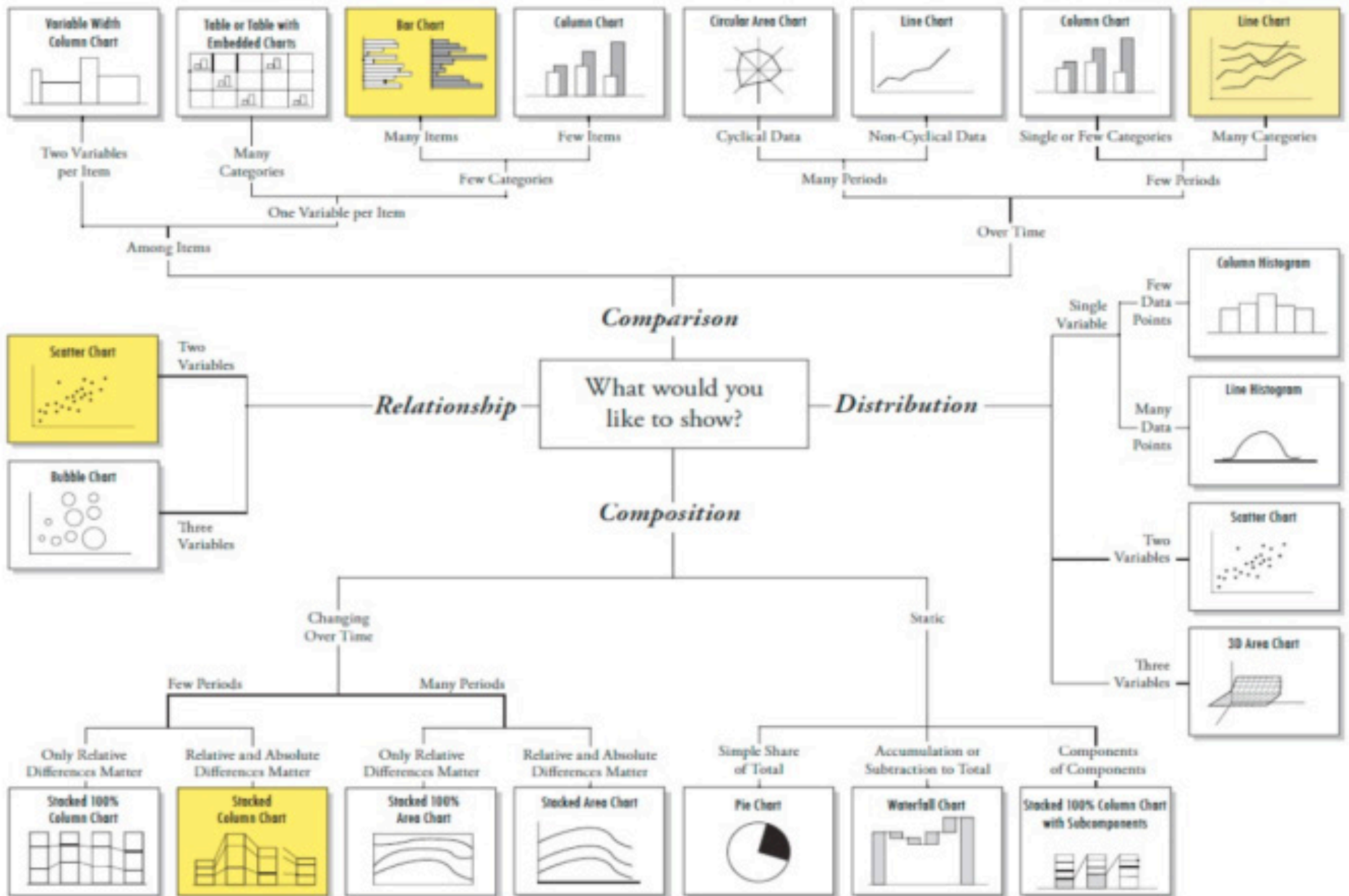
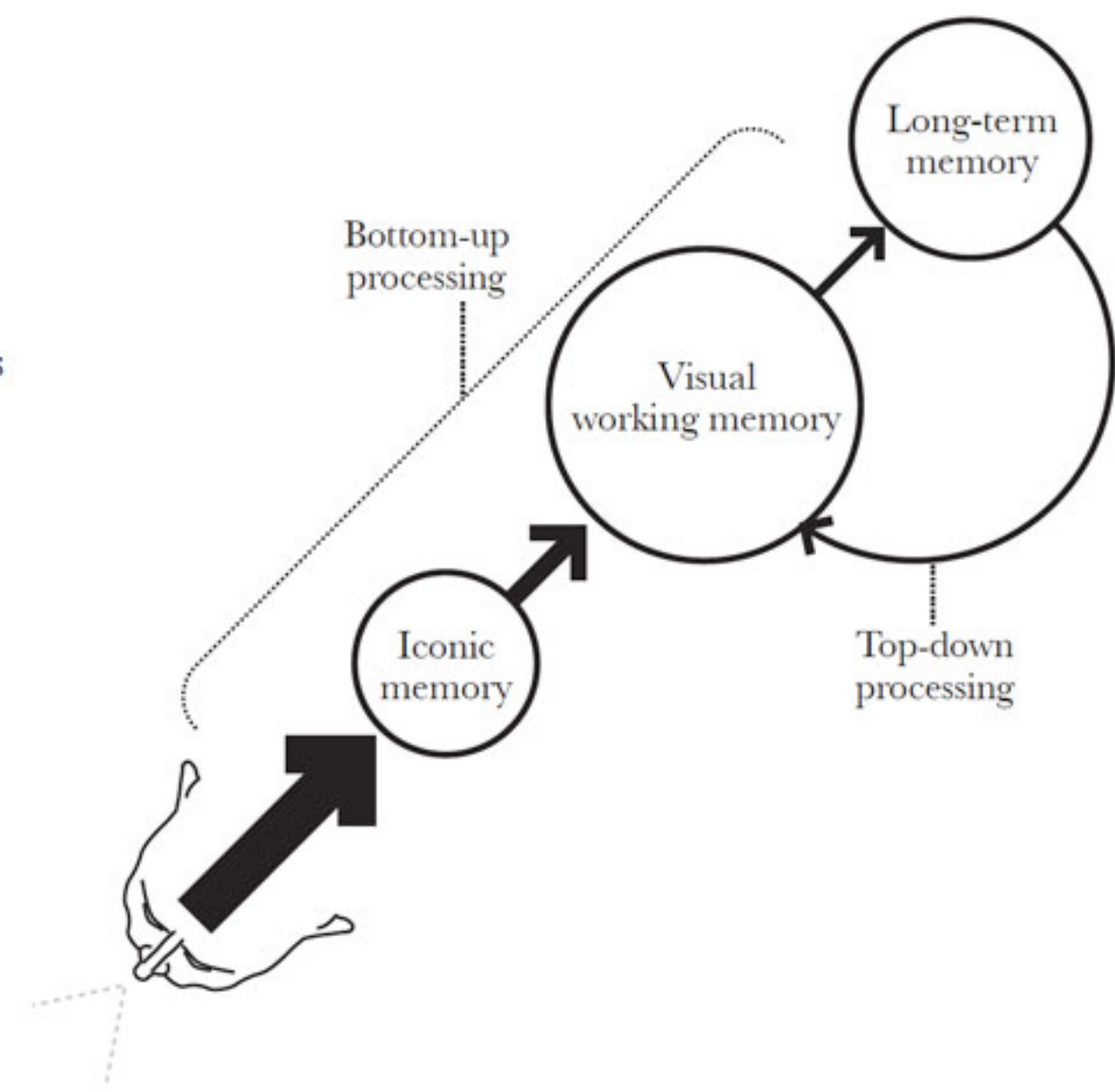
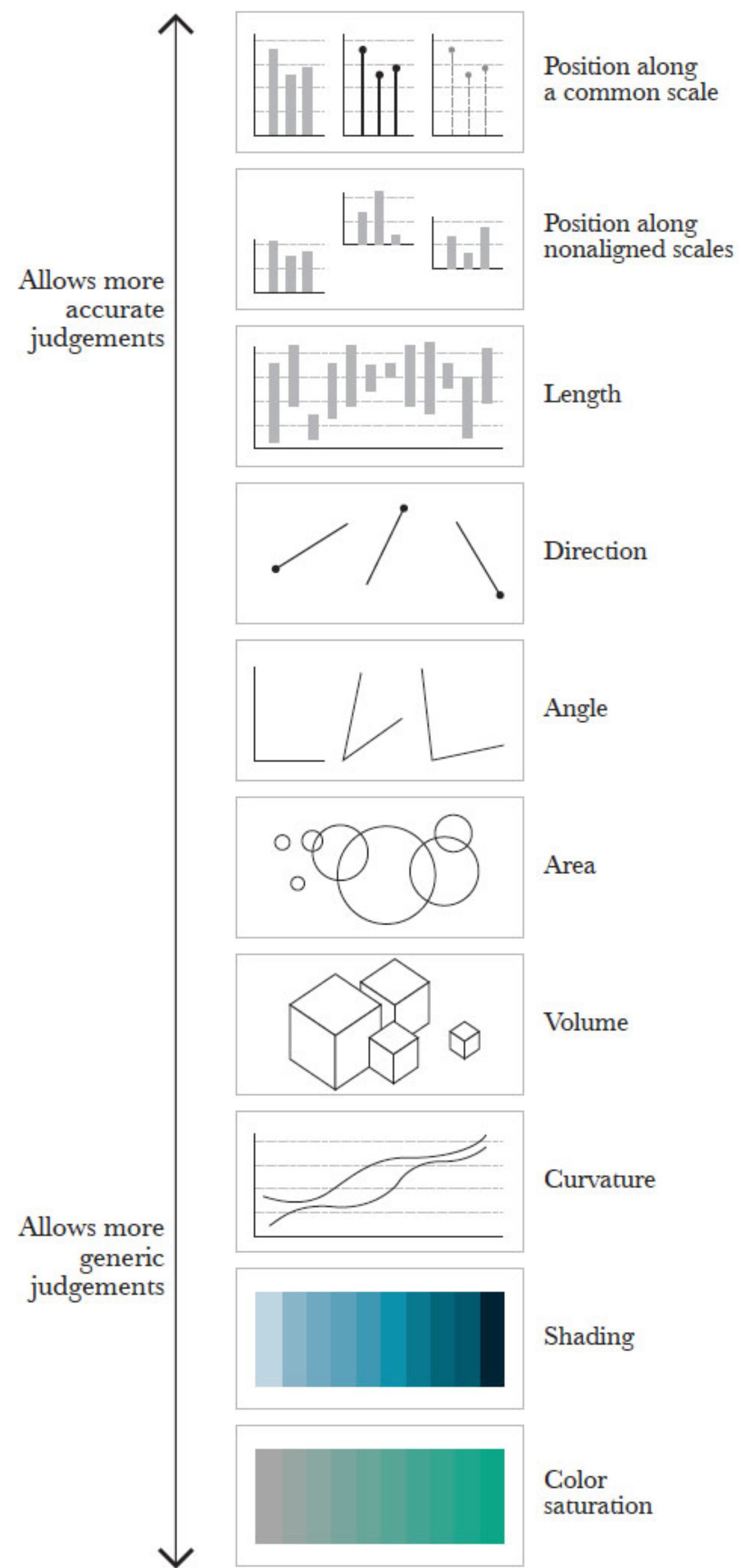


Chart Suggestions—A Thought-Starter







Pictures from
The Functional Art,
pages 120 and 138

LINES

Classic form

Show trends

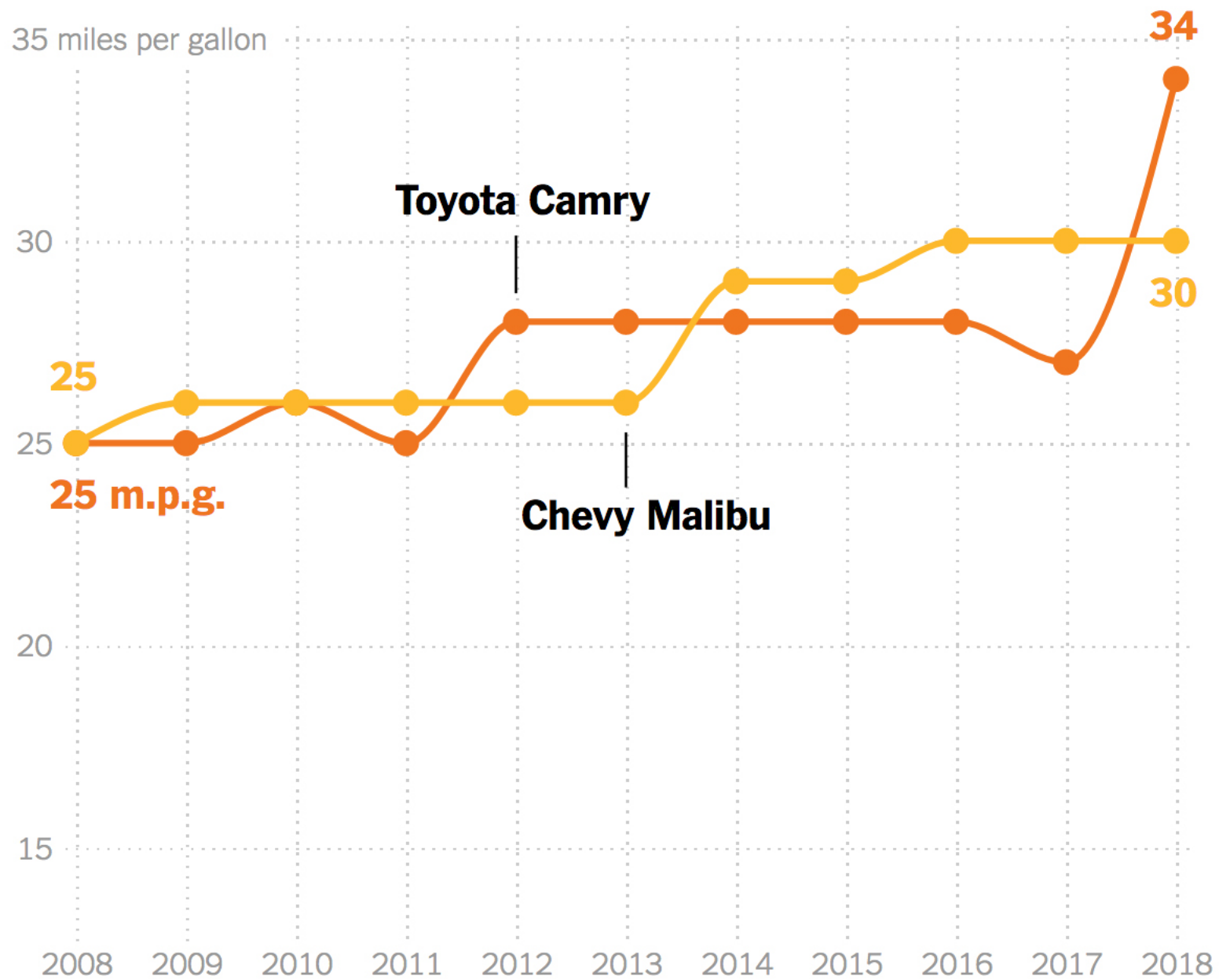
Good for comparing over time

Continuous data

Common mistakes: Unnecessary legends, 3D, correlations not causation



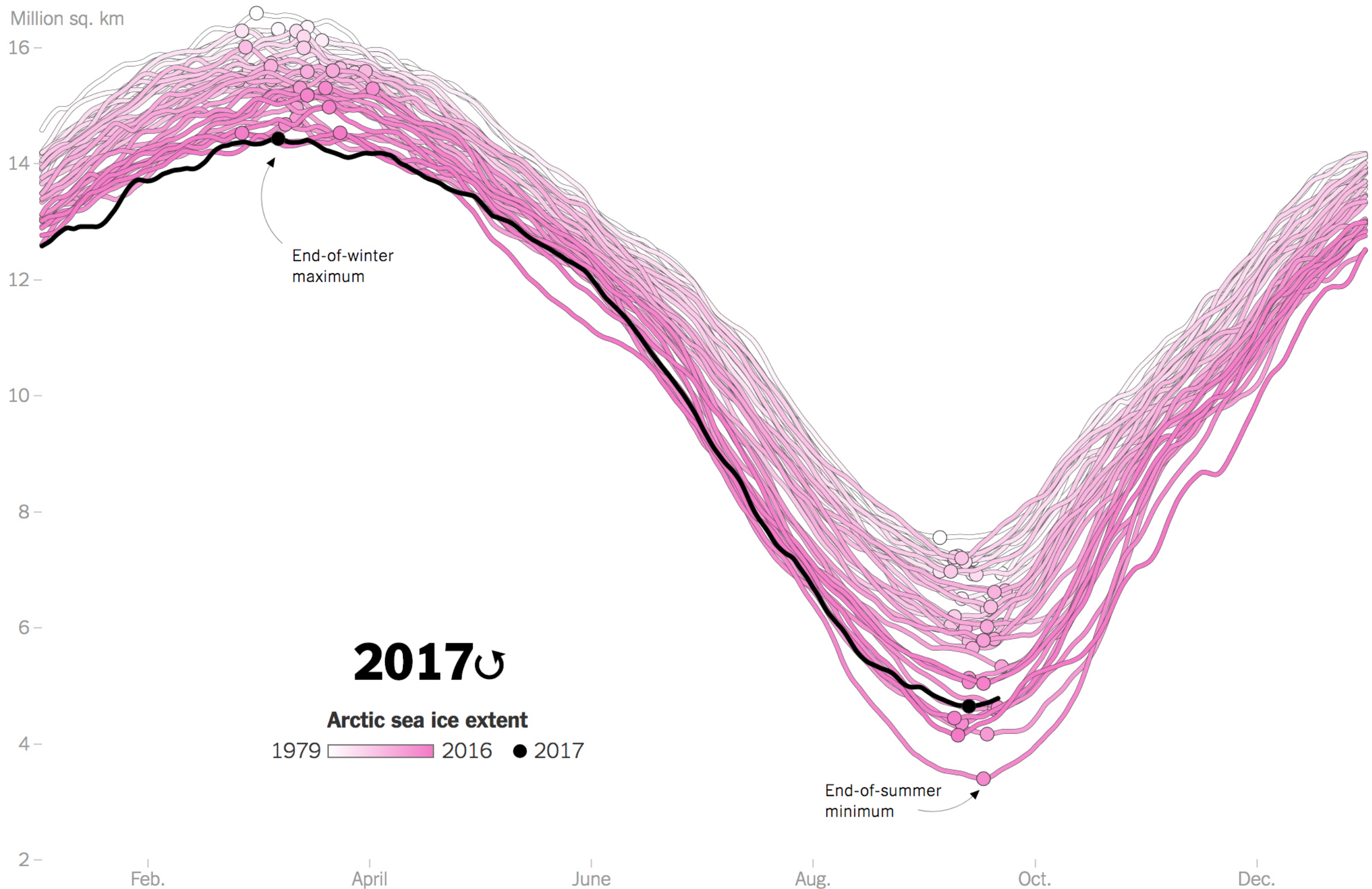
Two paths for how sedans have improved engines



Fuel economy, combined city and highway, miles per gallon | Source: fueleconomy.gov

We Charted Arctic Sea Ice for Nearly Every Day Since 1979. You'll See a Trend.

By NADJA POPOVICH, HENRY FOUNTAIN and ADAM PEARCE SEPT. 22, 2017



	1999.1.1	65 months	2004.4.28	low	high	2003.4.28	12 months	2004.4.28	low	high
Euro foreign exchange \$	1.1608		1.1907	.8252	1.2858	1.1025		1.1907	1.0783	1.2858
Euro foreign exchange ¥	121.32		130.17	89.30	140.31	132.54		130.17	124.80	140.31
Euro foreign exchange £	0.7111		0.6665	.5711	0.7235	0.6914		0.6665	0.6556	0.7235

	\$64,368	Vanguard 500 Index	-2.0%	+12.2%	-11.7%	-0.8%
	62,510	Fidelity Magellan	-2.1	+11.3	-12.9	-0.2
	50,329	Amer A Invest Co Am	-1.2	+09.4	-03.9	+4.0
	47,355	Amer A WA Mutual Inv	-1.5	+09.9	+00.8	+3.0
	40,500	PIMCO Instl Tot Return	-2.3	+02.4	+09.4	+7.6
	37,641	Amer A Grow Fd Amer	-2.9	+14.1	-11.0	+7.4
	31,161	Fidelity Contrafund	-1.0	+10.7	-06.5	+3.0
	28,296	Fidelity Growth & Inc	-1.8	+08.2	-08.7	-0.1
	25,314	Amer A Inc Fund Amer	-0.5	+09.9	+05.5	+5.4
	24,155	Vanguard Instl Index	-2.0	+12.3	-11.6	-0.7

Lunge Feeding

Scientists tracking fin whales have created the first detailed model of how they feed. After gliding to depths of more than 600 feet in search of krill, a fin whale will repeatedly accelerate and open its mouth wide, engulfing about 20 pounds of krill and more than its own weight in water as it grinds to a halt.



START OF LUNGE
After accelerating into a school of krill, the whale opens its mouth.

Lunge
SPEED
... 5 miles per hour
0 6 seconds



2 SECONDS
Grooves in the blubber between the lower jaws begin to expand.



3 SECONDS
Now fully open, the mouth causes massive drag and deceleration.

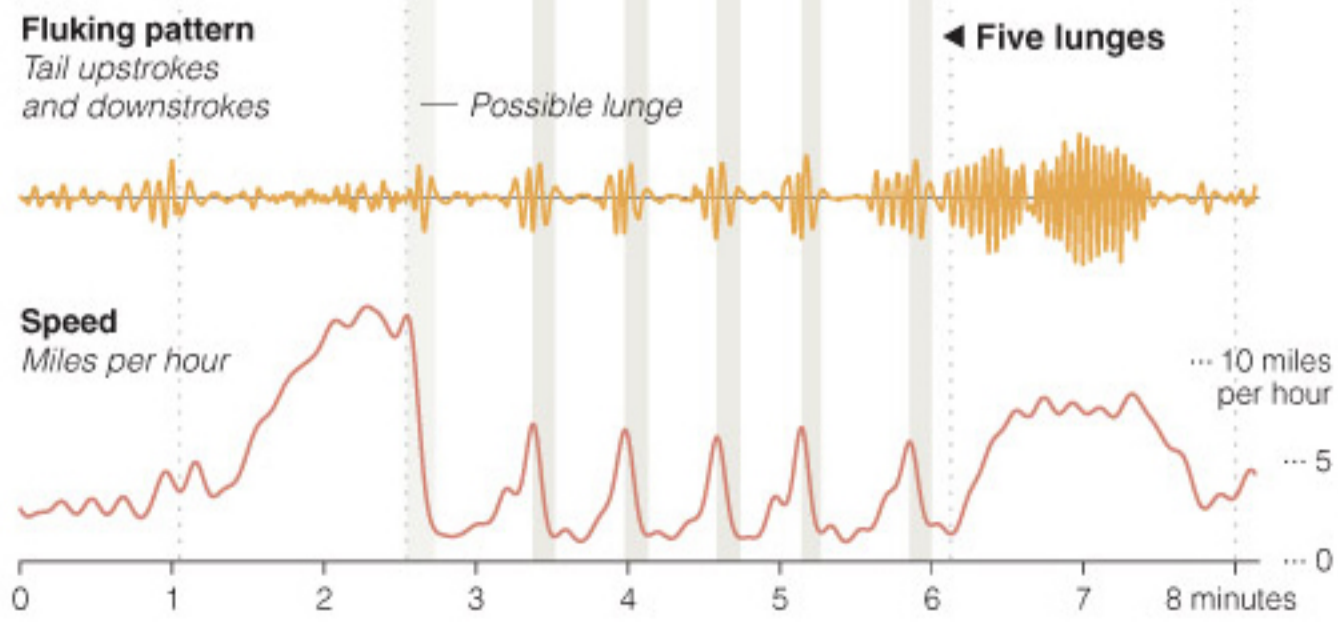
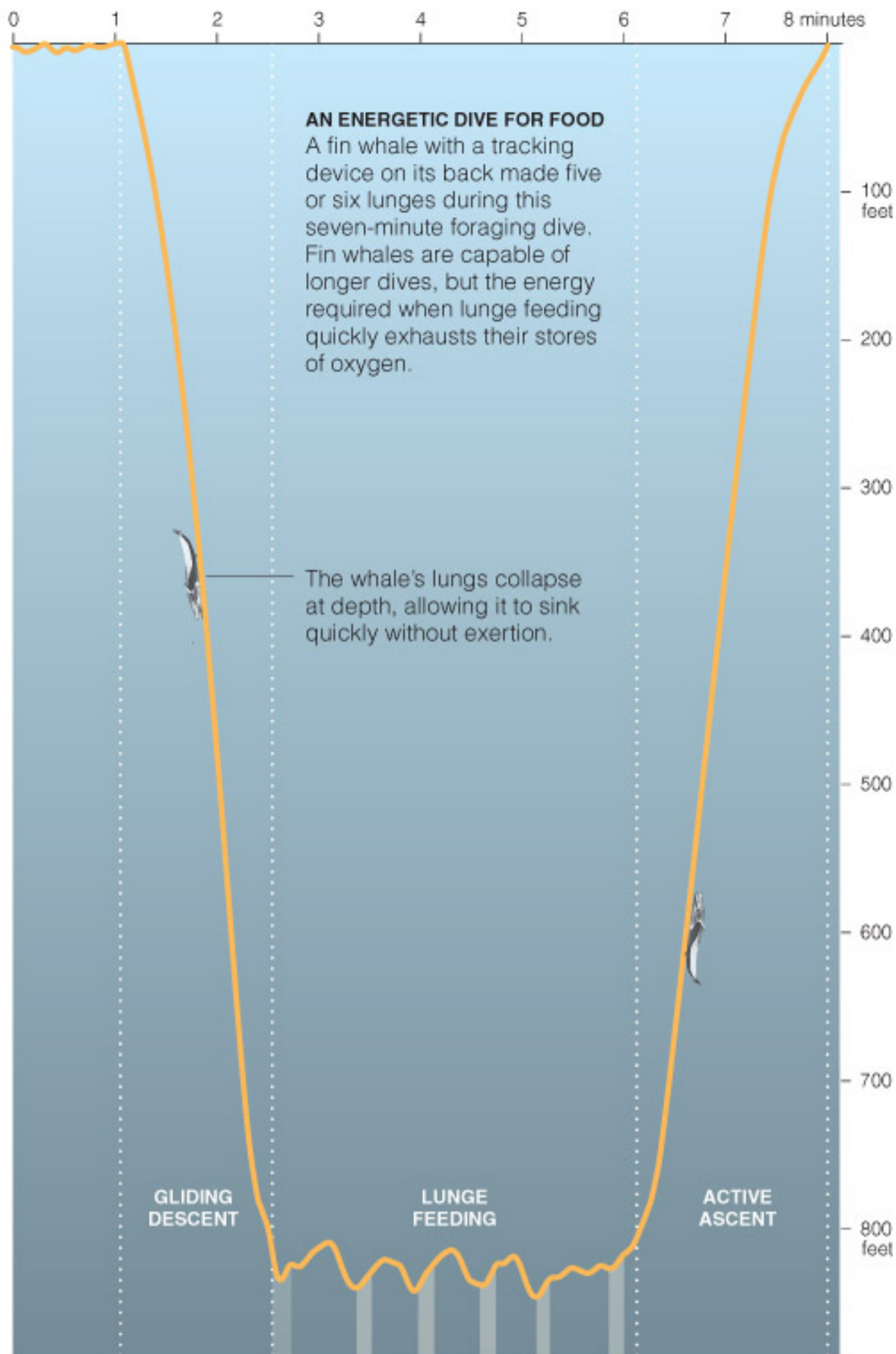


4 SECONDS
The closing mouth continues to drag as the whale pushes forward.



6 SECONDS
The whale starts to filter out the krill and prepare for another lunge.

... 5 miles per hour
0 6 seconds



Sources: Jeremy A. Goldbogen; Nicholas D. Pyenson; *Journal of Experimental Biology*; *Marine Ecology Progress Series*

JONATHAN CORUM/THE NEW YORK TIMES; WHALE ILLUSTRATIONS BY NICHOLAS D. PYENSON

BARs

Classic form

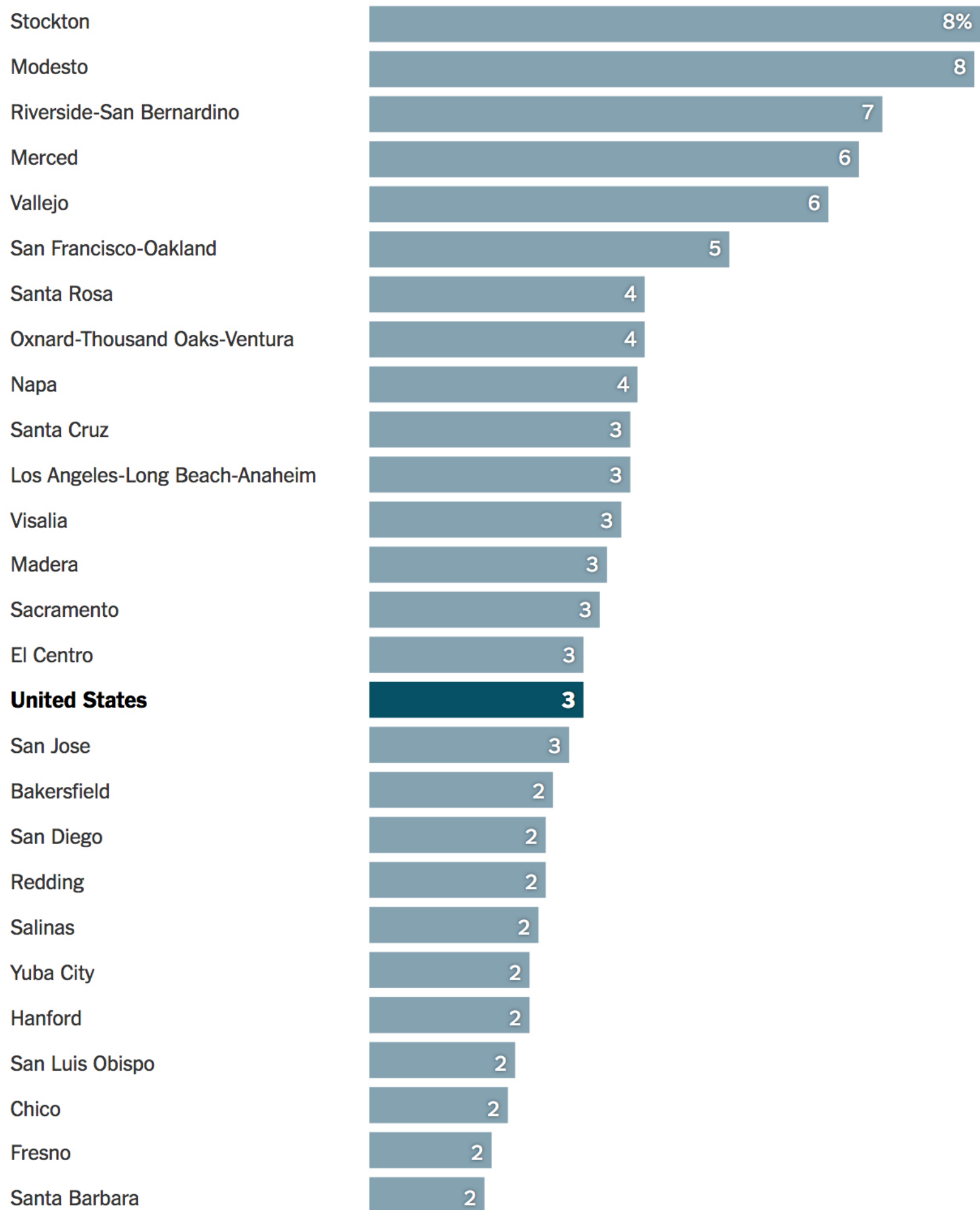
Precise comparisons

Distinct data

Common mistakes: Non zero baselines, random ordering of items

The Worst Commutes in California

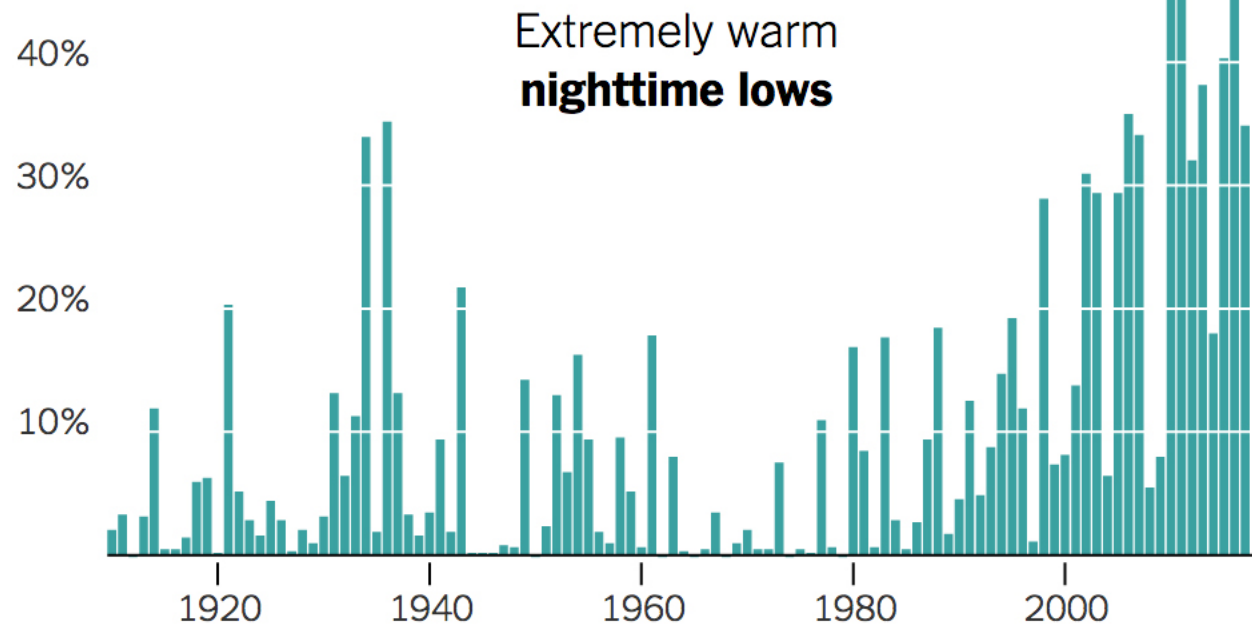
The share of commuters who travel 90 or more minutes to work.



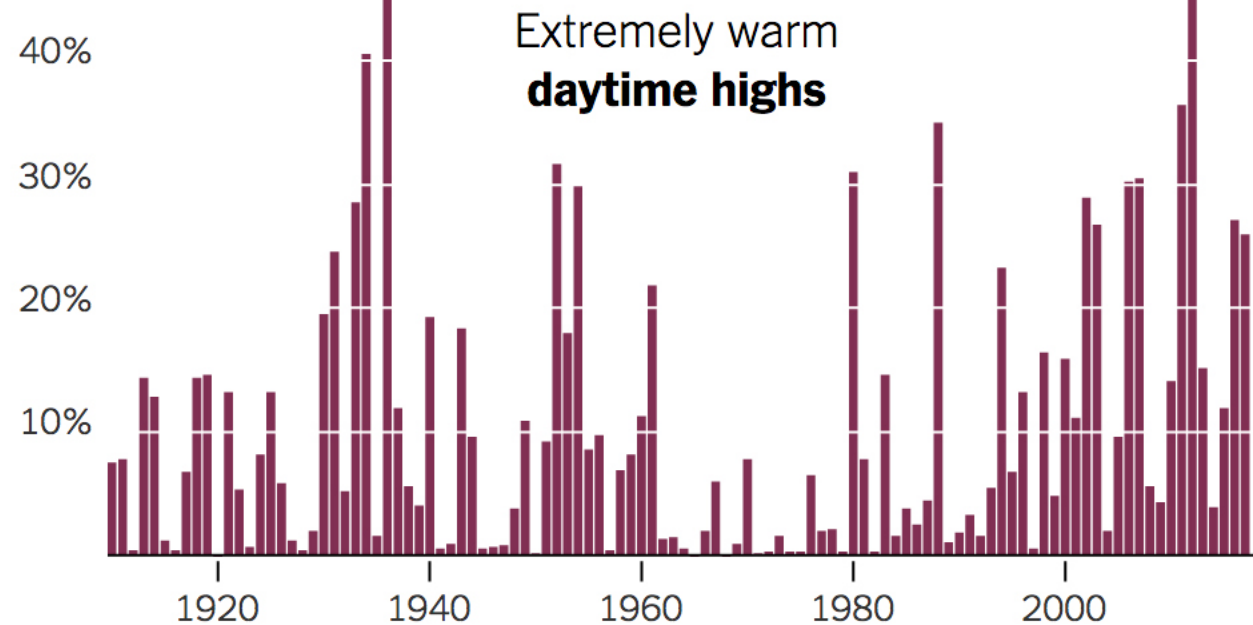
More of the U.S. is Seeing Extremely Warm Temperatures at Night

Percentage of the United States in which local areas are experiencing extreme minimum (nighttime) and maximum (daytime) summer temperatures

50% of United States area



50%



Source: National Oceanic and Atmospheric Administration | NOAA defines extremely hot temperatures as those in the top 10 percent for the local period of record.

In the mid-2000s, ESPN’s appetite for programming was so voracious that the Justice Department looked into complaints that the network was engaging in anticompetitive practices — an inquiry that ESPN executives first acknowledged in recent interviews. The complaint centered on ESPN’s practice of buying rights to more college games than it had the capacity to televise, leading to accusations that by “warehousing” games, it was depriving colleges of exposure and other networks of potentially valuable programming.

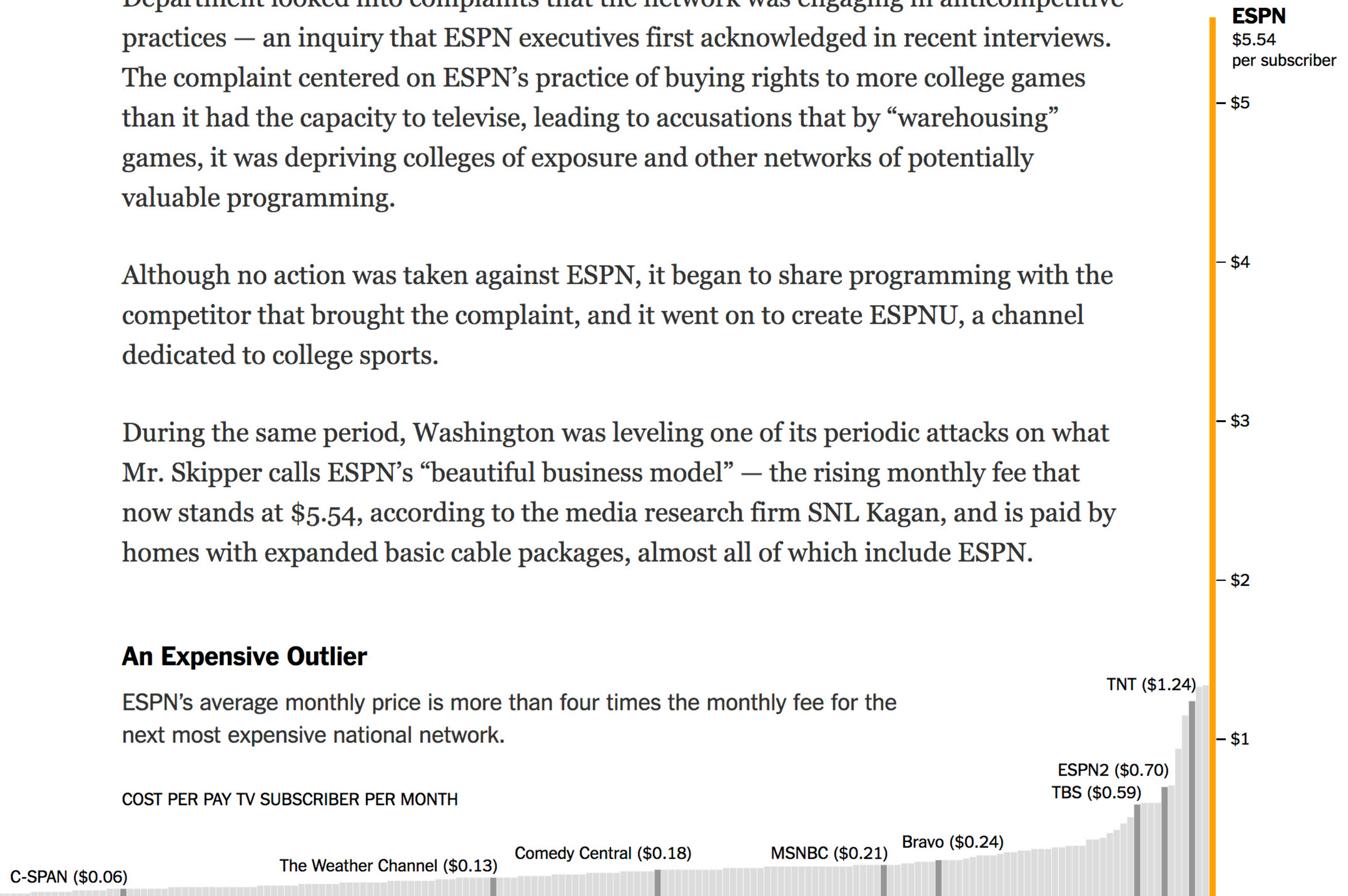
Although no action was taken against ESPN, it began to share programming with the competitor that brought the complaint, and it went on to create ESPNU, a channel dedicated to college sports.

During the same period, Washington was leveling one of its periodic attacks on what Mr. Skipper calls ESPN’s “beautiful business model” — the rising monthly fee that now stands at \$5.54, according to the media research firm SNL Kagan, and is paid by homes with expanded basic cable packages, almost all of which include ESPN.

An Expensive Outlier

ESPN’s average monthly price is more than four times the monthly fee for the next most expensive national network.

COST PER PAY TV SUBSCRIBER PER MONTH



Source: SNL Kagan

There's a strand of the data viz world that argues that everything could be a bar chart. That's possibly true but also possibly a world without joy.

Amanda Cox

Data Types

Categorical/Discrete



Countries (USA, Canada)
Dog breeds (Terrier, Dalmation)
Colors (Red, Blue)

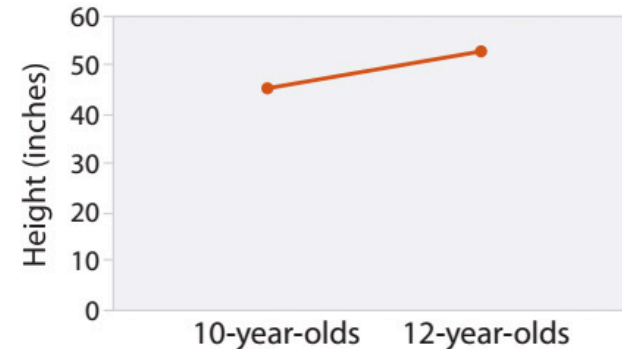
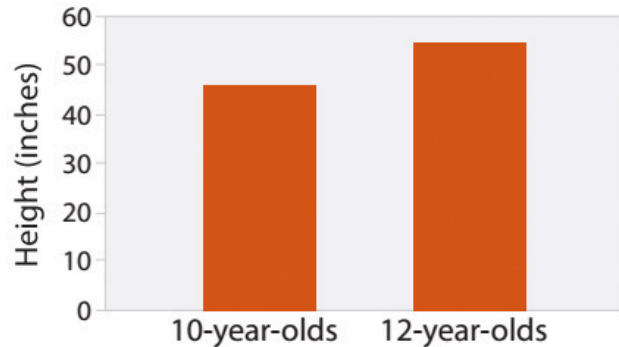
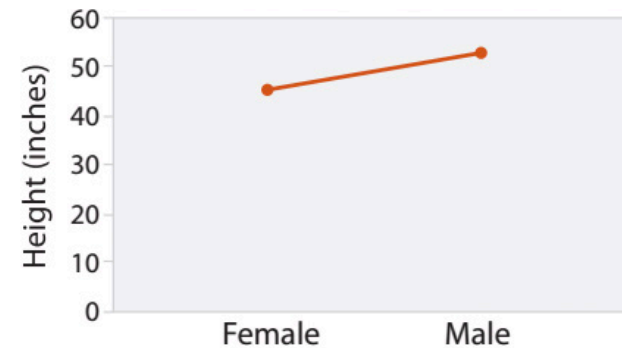
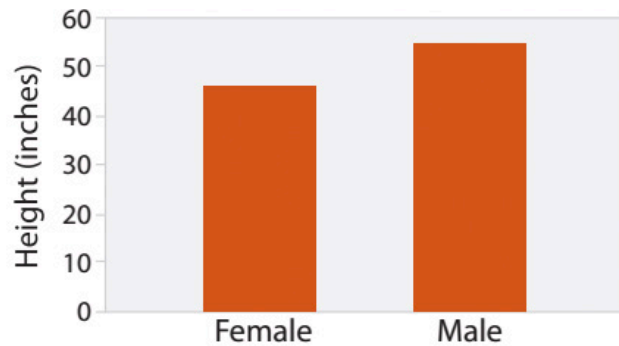
Continuous



Temperature (50° → 80°F)
Stock market prices (\$4 → \$10)
Weight (100 → 200 lbs)

Bars: Categorical Data

Lines: Continuous Data



**“The more male a person is,
the taller he/she is.”**

Bubbles & Pies

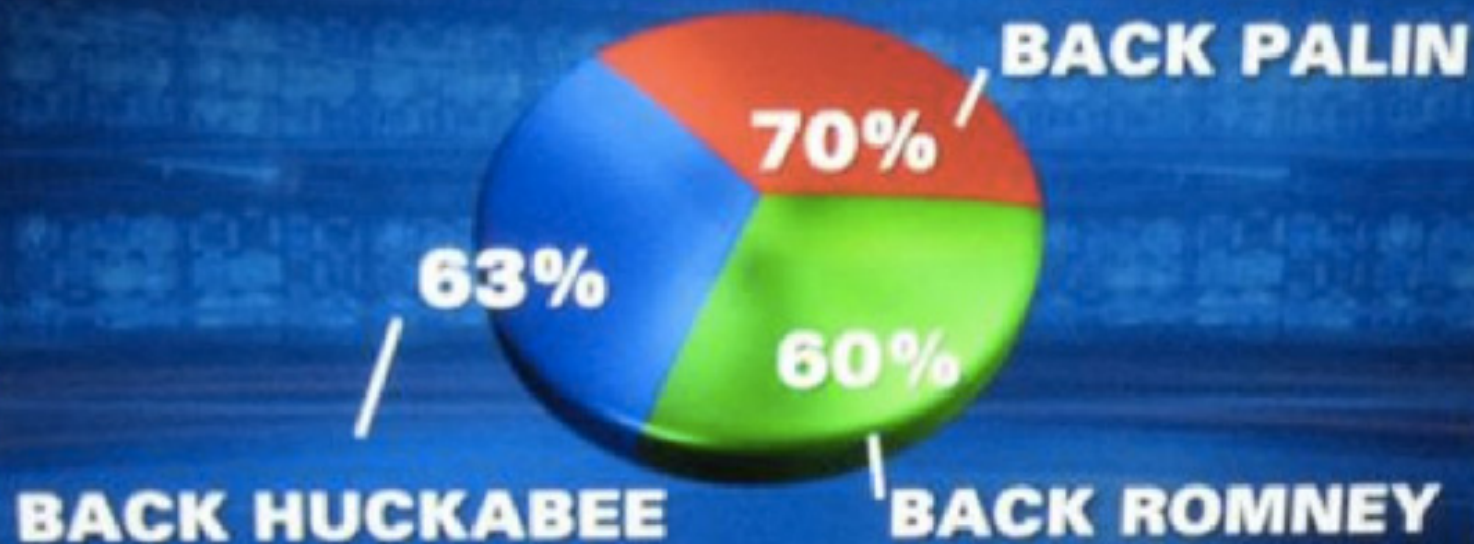
Parts of a Whole
Use sparingly

Common mistakes: Too many pieces in a pie chart, Complex legends, Not adding to 100%



2012 PRESIDENTIAL RUN

GOP CANDIDATES

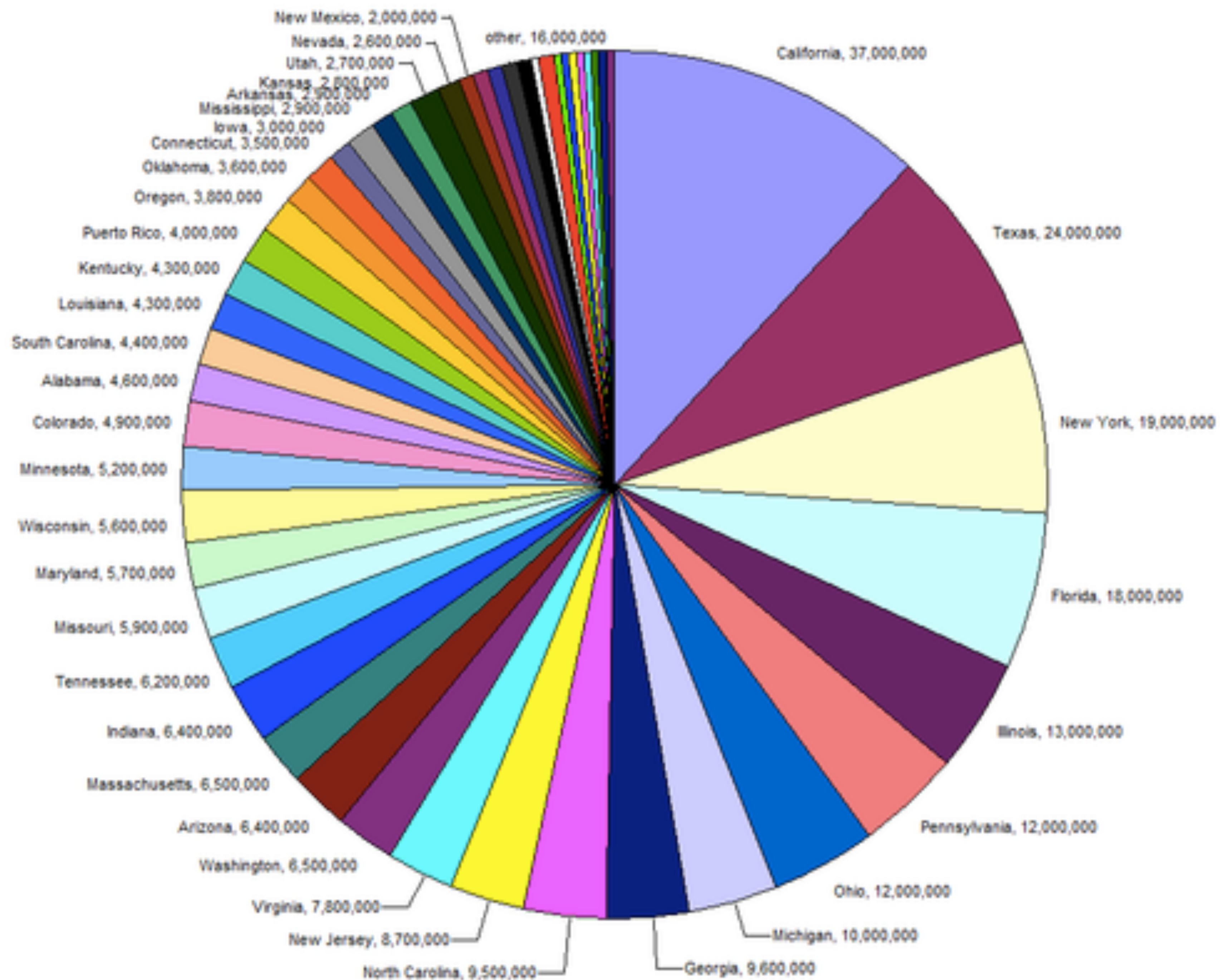


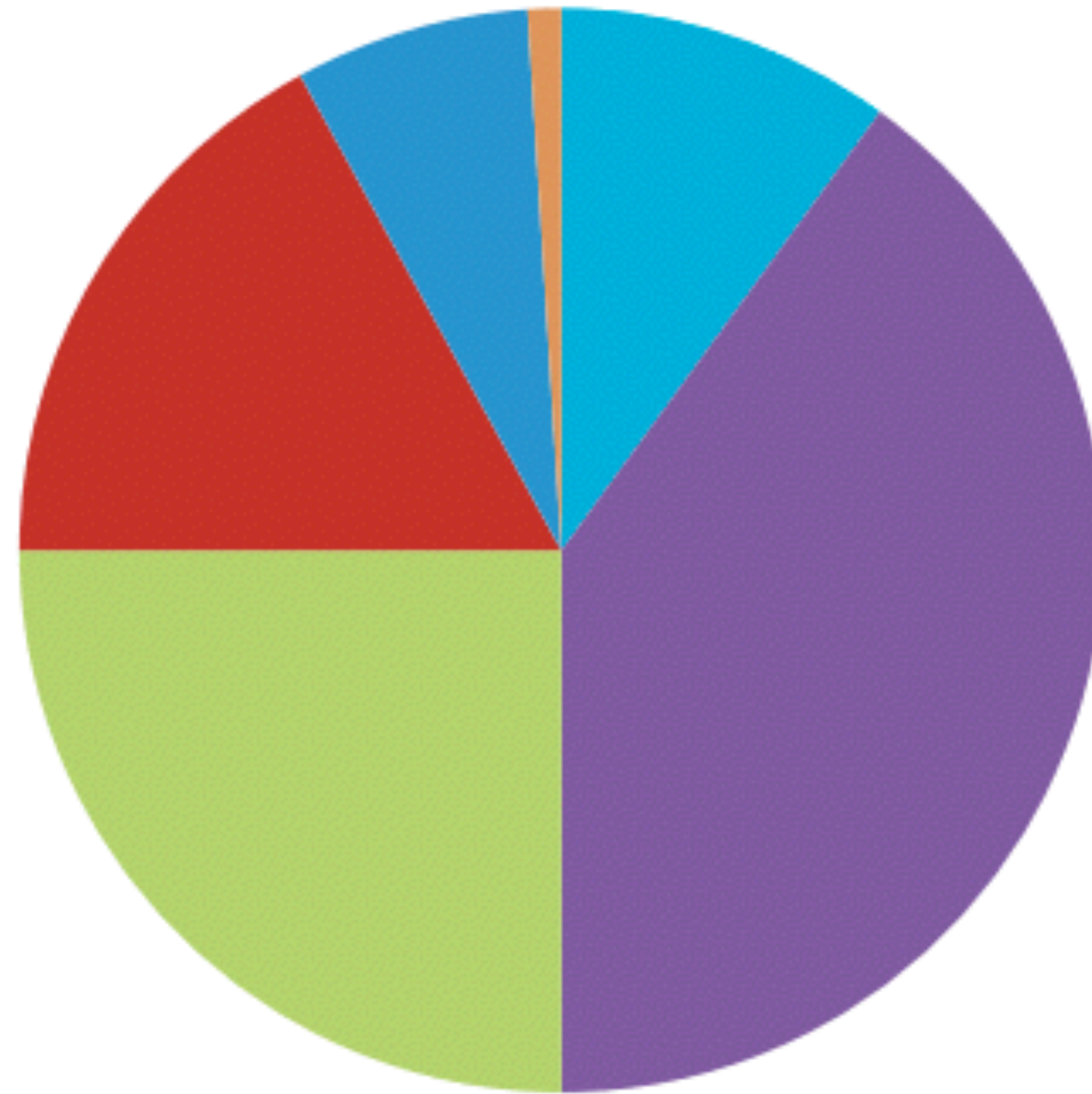
FOX

47'

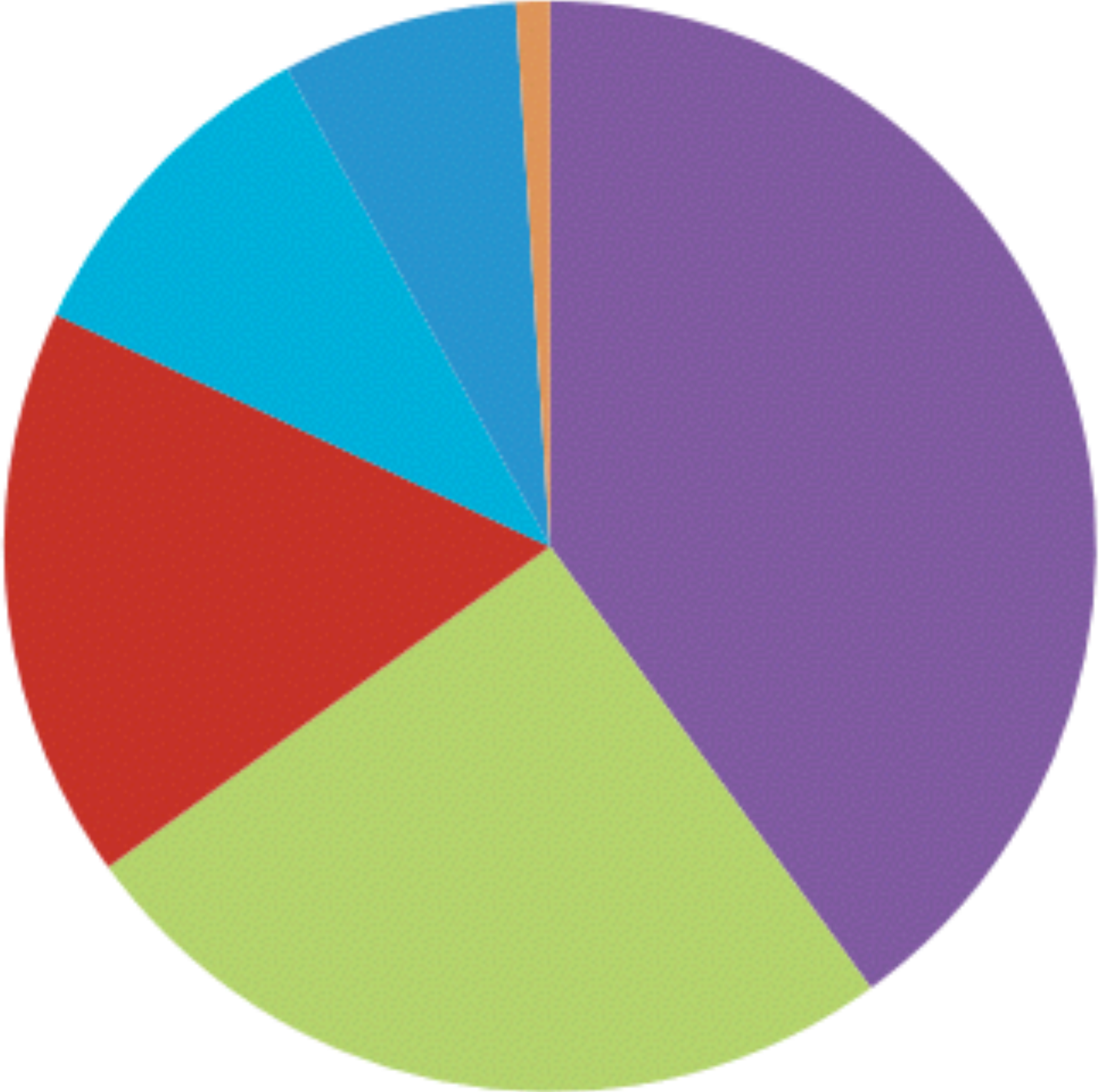
SOURCE: OPINIONS

DYNAMIC

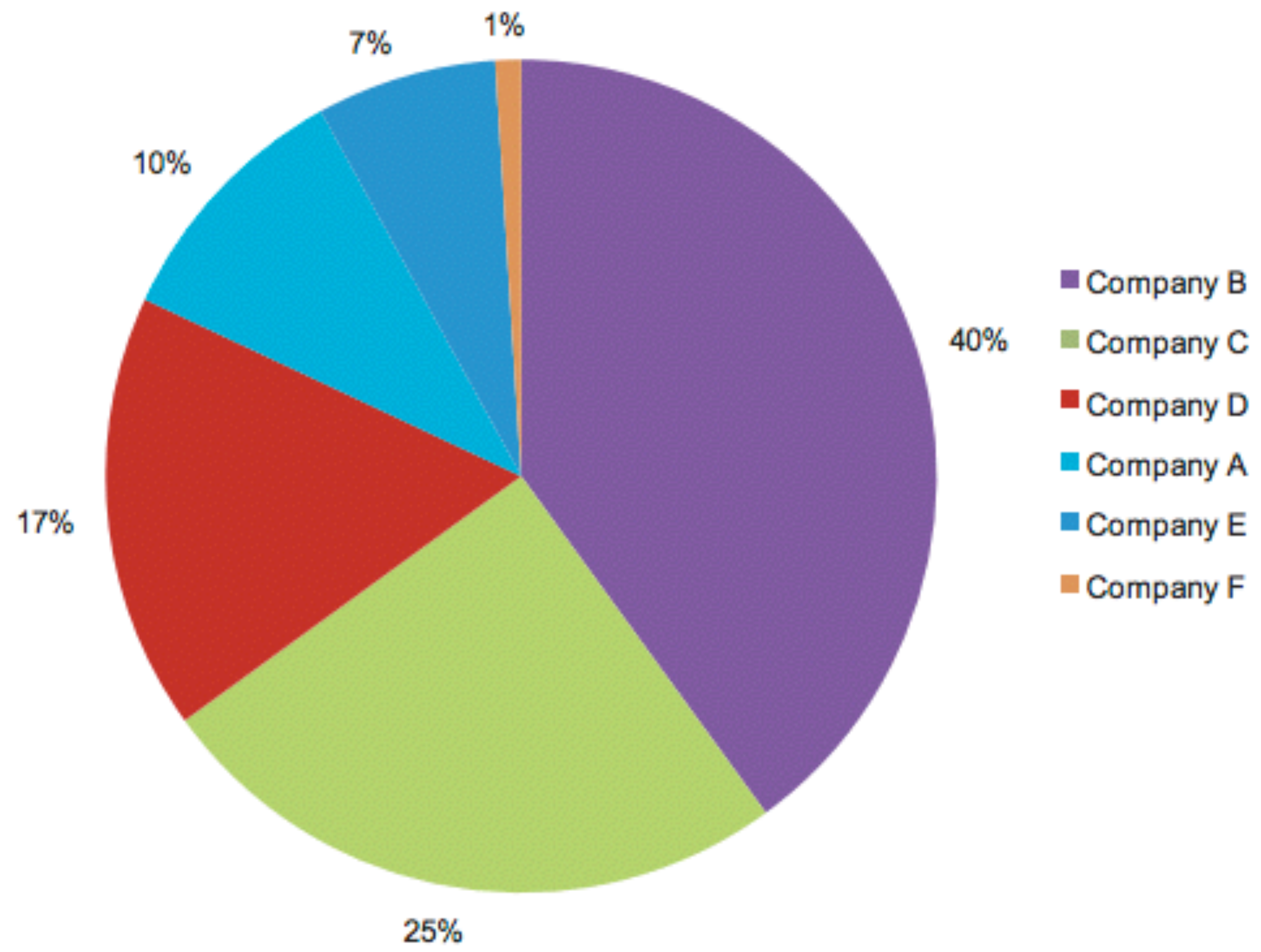


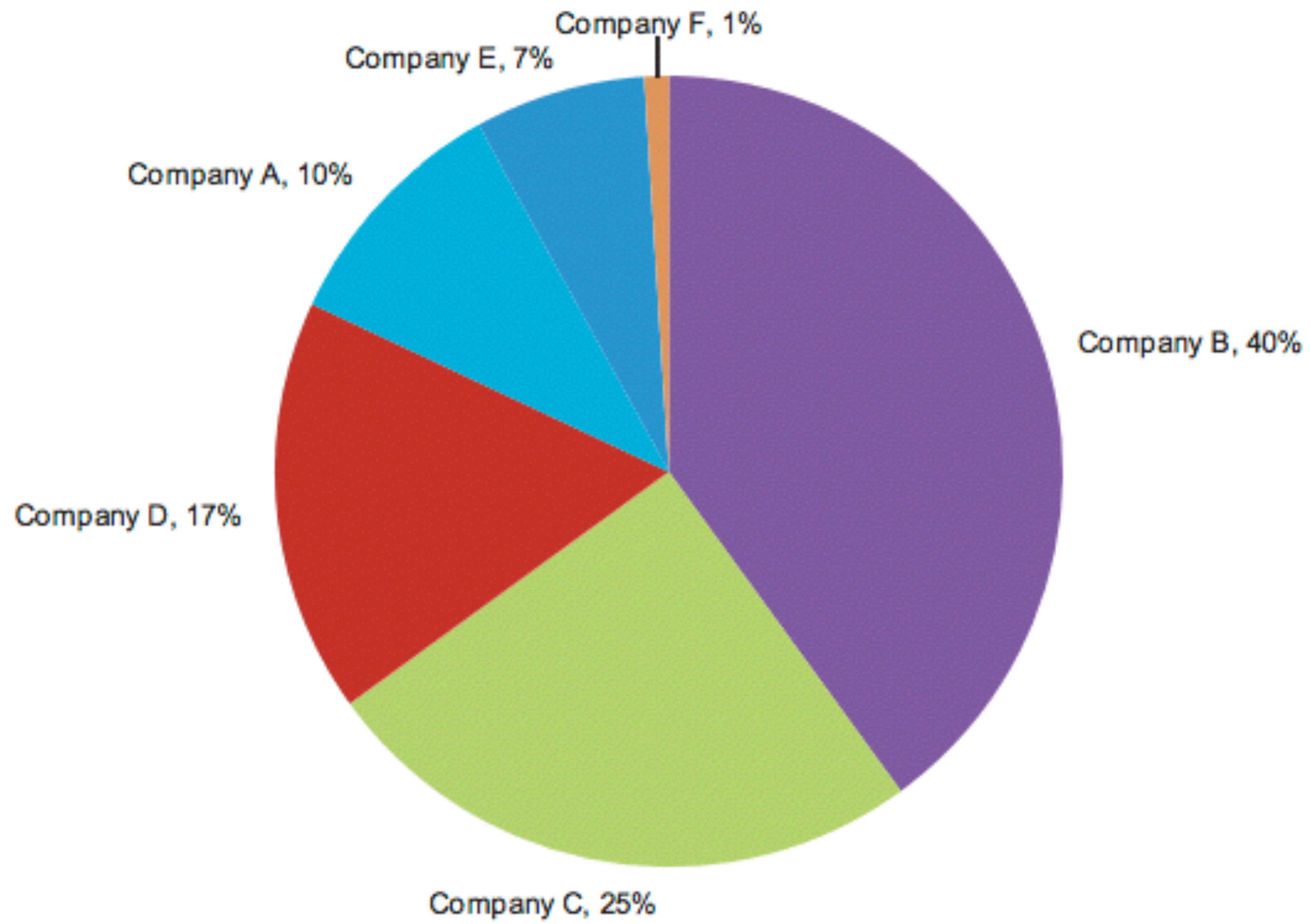


- Company A
- Company B
- Company C
- Company D
- Company E
- Company F



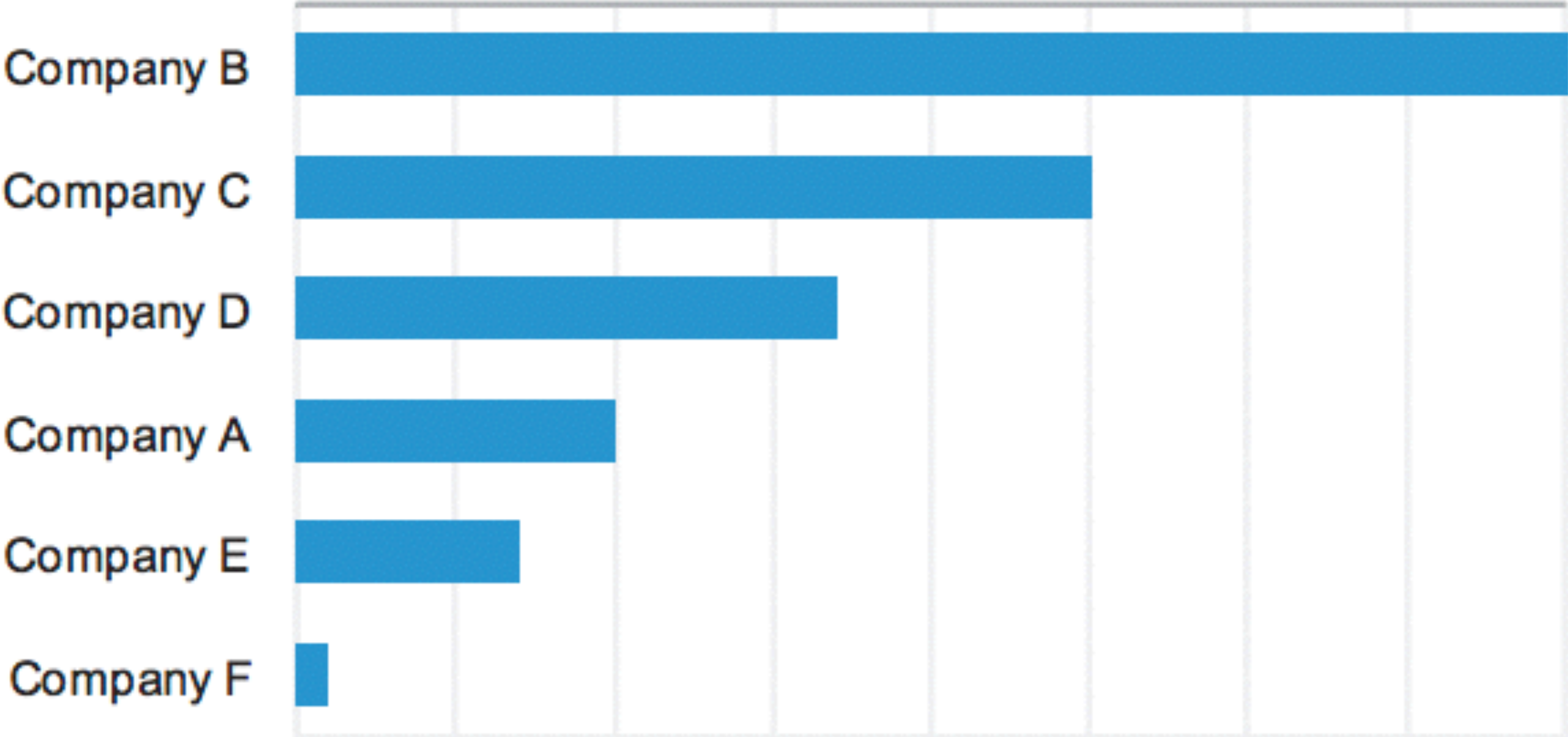
- Company B
- Company C
- Company D
- Company A
- Company E
- Company F





Company Percentages of Total Market Share

0% 5% 10% 15% 20% 25% 30% 35% 40%



Scatterplot

Showing relationships
Individual data points

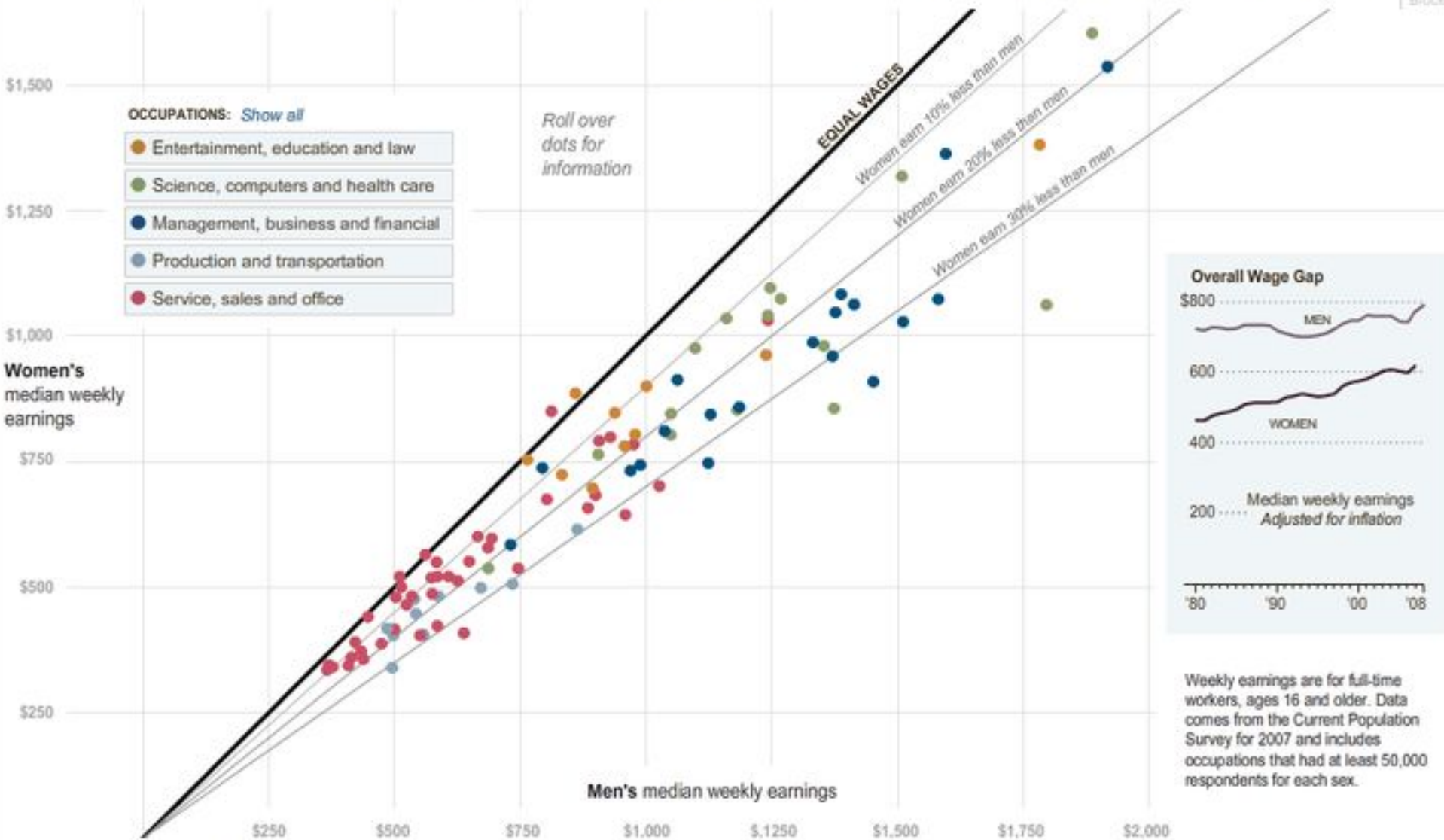
Common mistakes: Drawing dubious conclusions, Not adding a trend line



Why Is Her Paycheck Smaller?

Nearly every occupation has the gap — the seemingly unbridgeable chasm between the size of the paycheck brought home by a woman and the larger one earned by a man doing the same job. Economists cite a few reasons: discrimination as well as personal choices within occupations are two major factors, and part of the gap can be attributed to men having more years of experience and logging more hours.

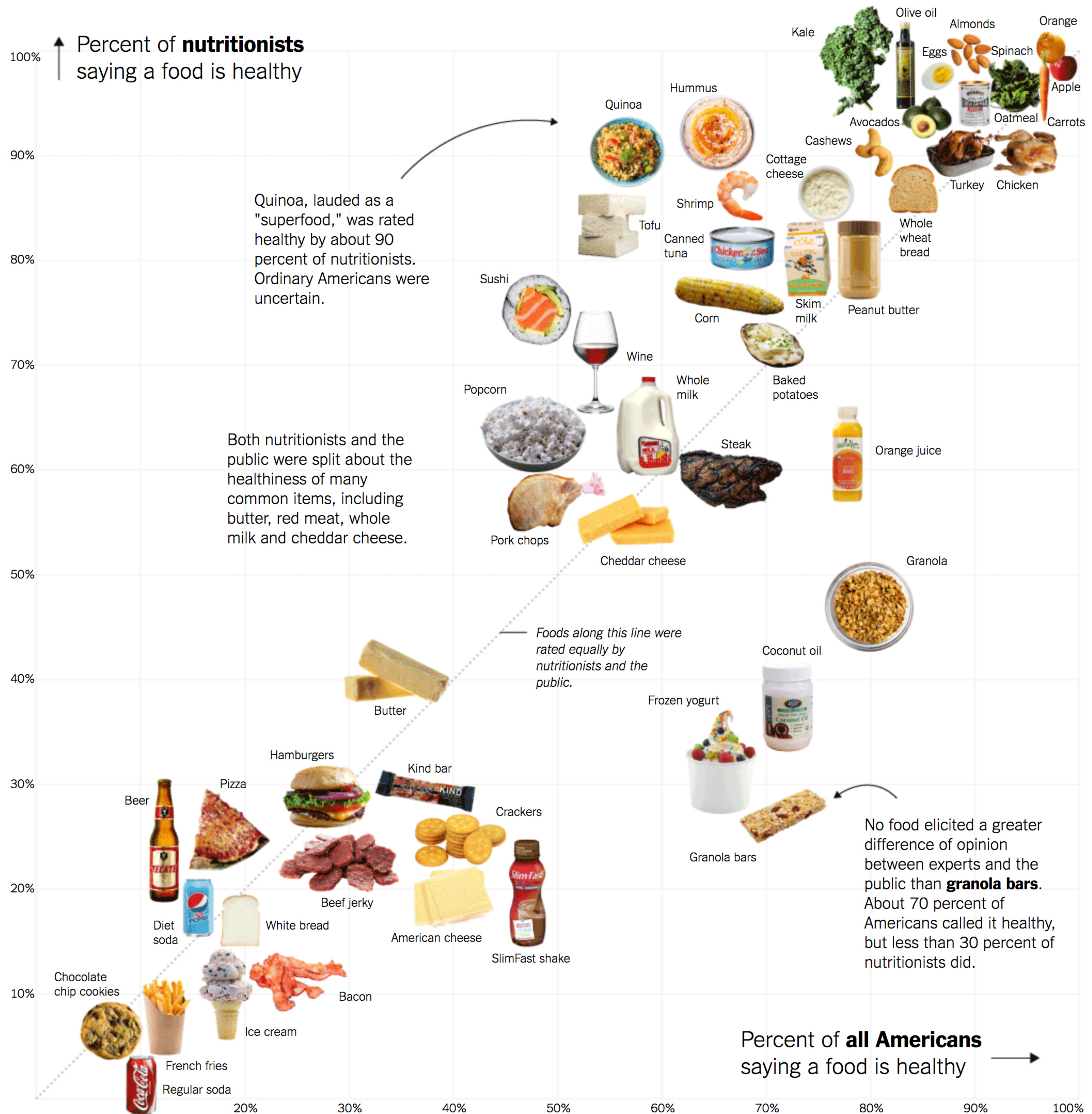
Block



Is Sushi 'Healthy'? What About Granola? Where Americans and Nutritionists Disagree

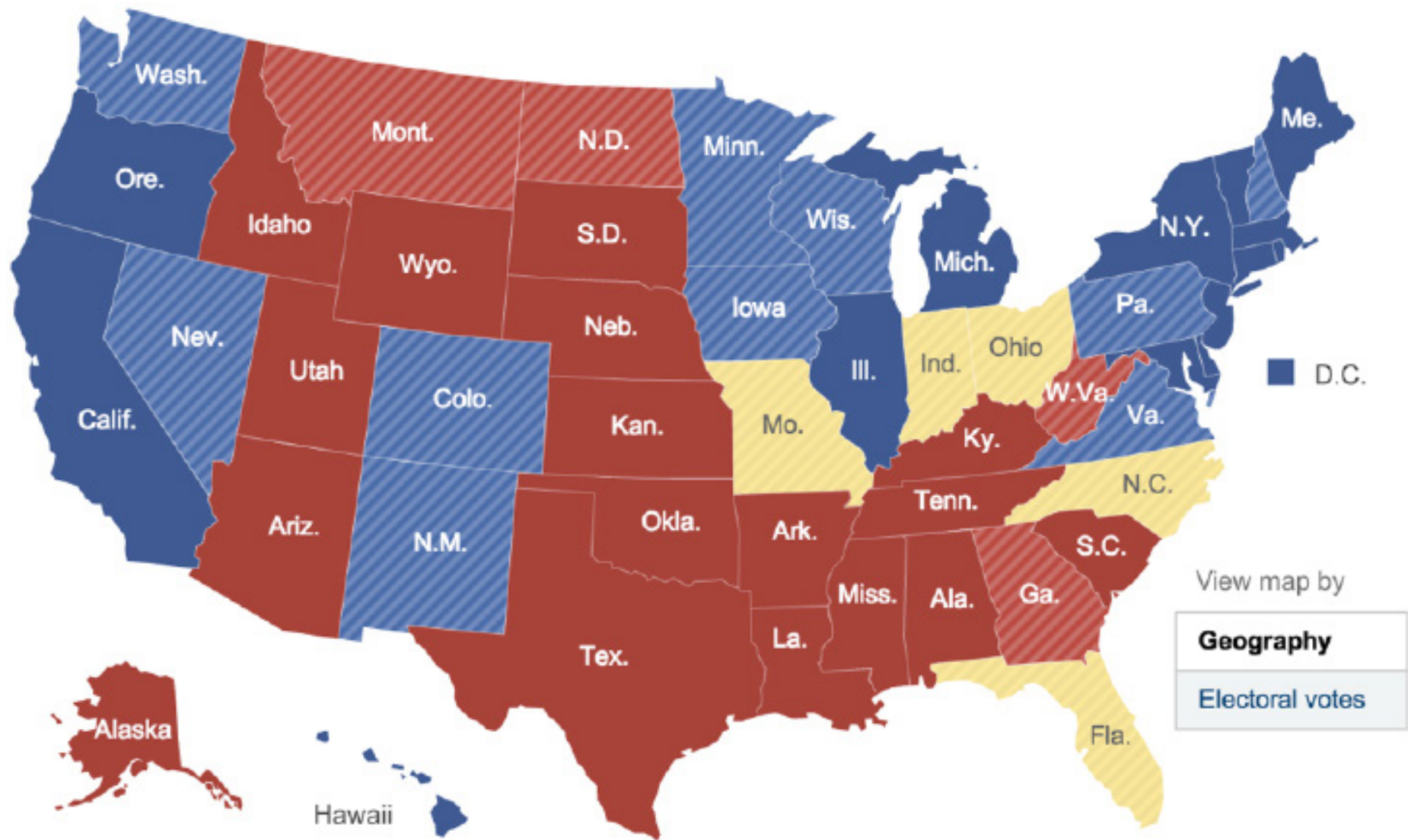
By KEVIN QUEALY and MARGOT SANGER-KATZ JULY 5, 2016

We surveyed Americans and a panel of nutrition experts about which foods they thought were good or bad for you.

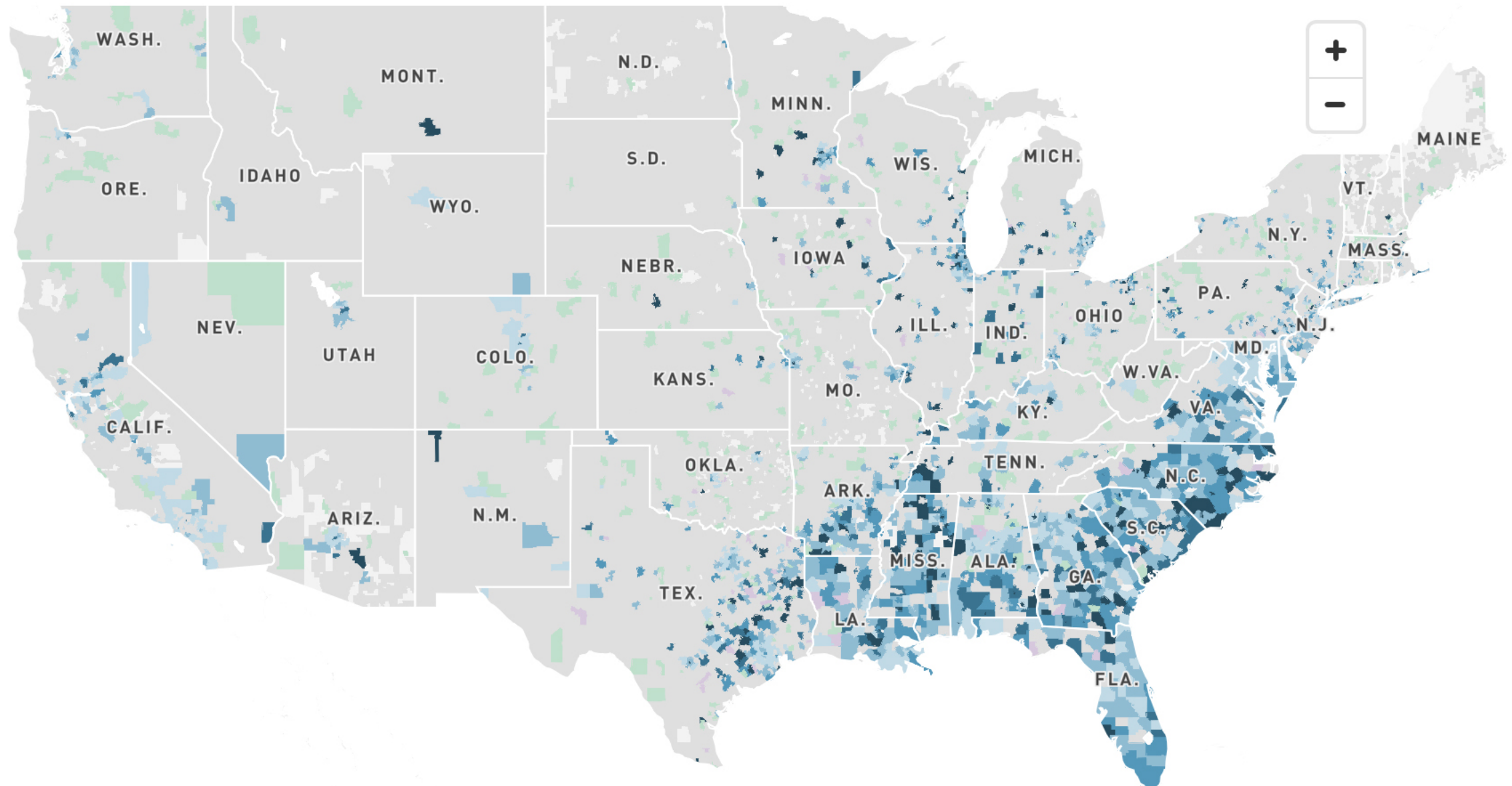
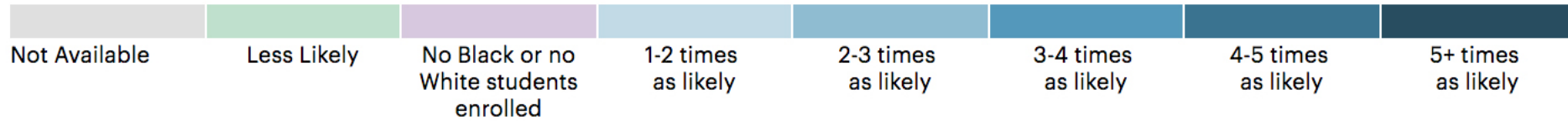


Maps & Cartograms

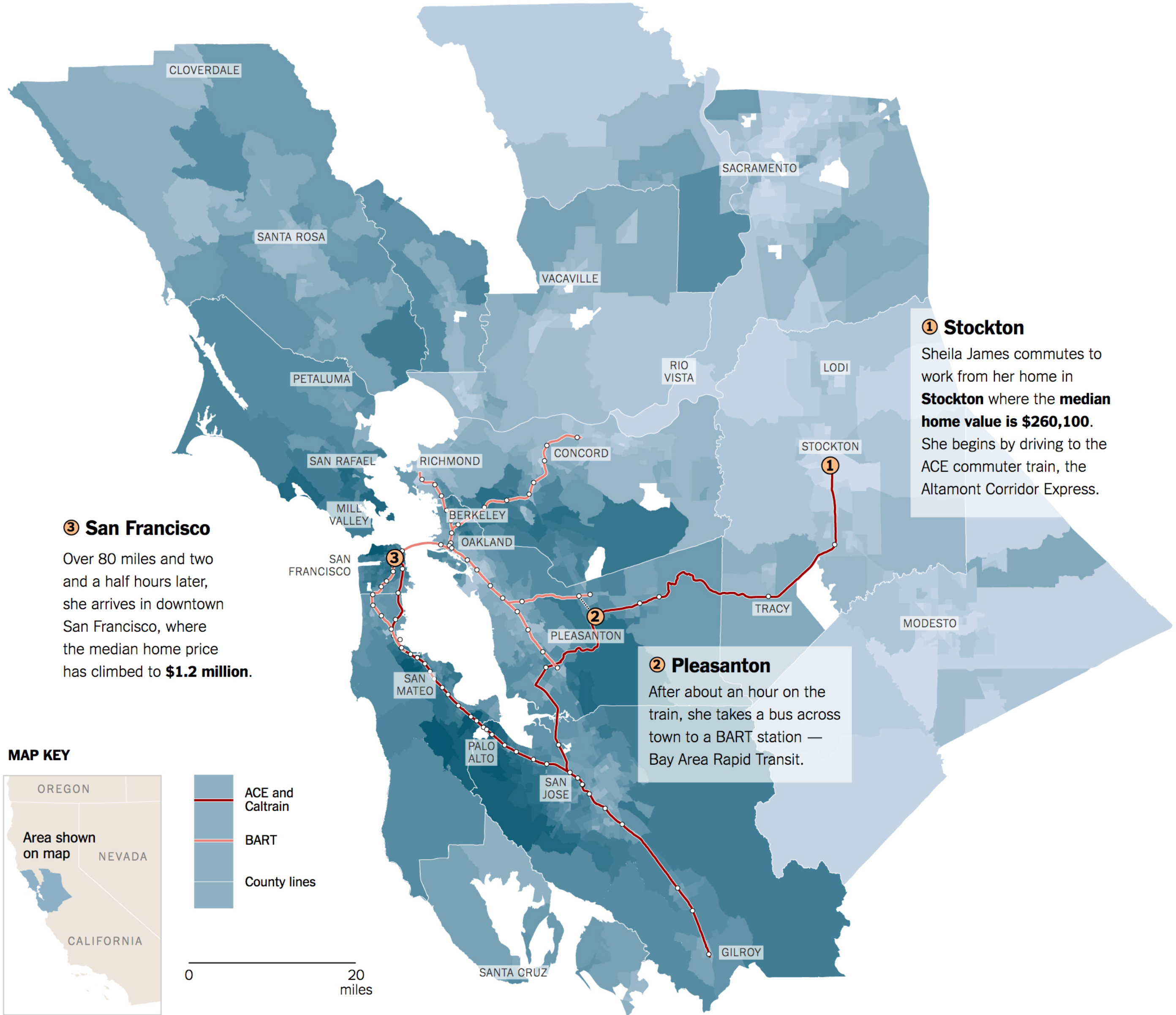
Geographic information
Place & Location is important
Compare countries/states/cities



School districts where White students are more likely to be in an Advanced Placement class or gifted and talented program, compared with Black students.



The price of a home along the commute



1 Stockton
 Sheila James commutes to work from her home in **Stockton** where the **median home value is \$260,100**. She begins by driving to the ACE commuter train, the Altamont Corridor Express.

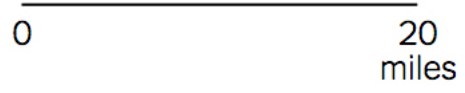
2 Pleasanton
 After about an hour on the train, she takes a bus across town to a BART station — Bay Area Rapid Transit.

3 San Francisco
 Over 80 miles and two and a half hours later, she arrives in downtown San Francisco, where the median home price has climbed to **\$1.2 million**.

MAP KEY



- ACE and Caltrain
- BART
- County lines



Notes: Data is the Zillow Home Value Index of median home values in over 2,000 census tracts in and around the Bay Area | Source: Zillow.com | By Karl Russell/The New York Times

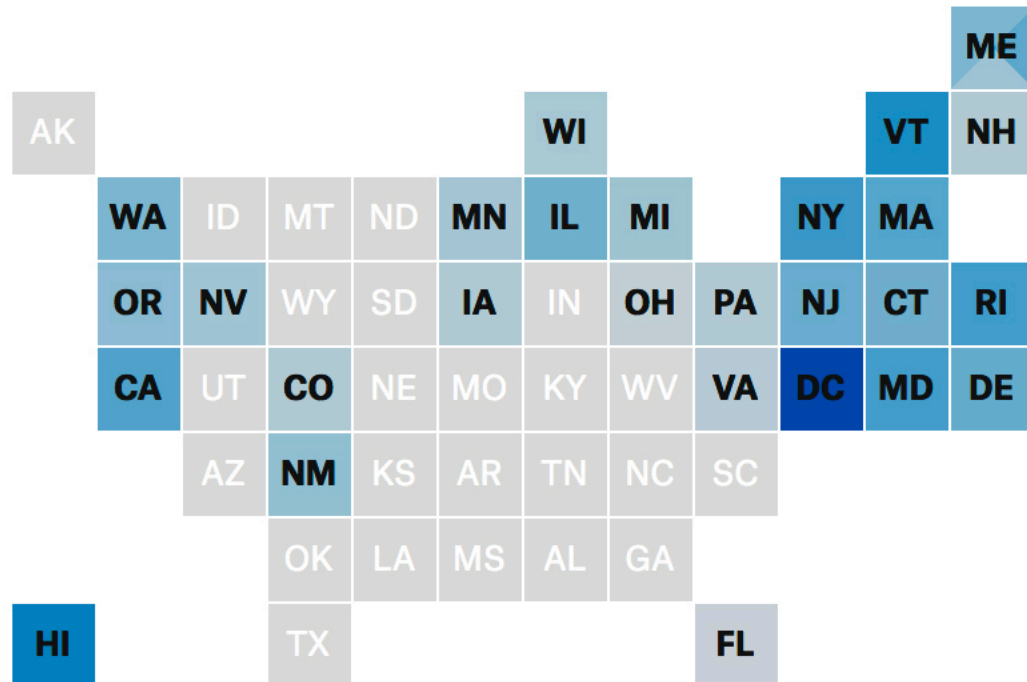
What Would It Take To Turn **Red** States **Blue** ?

Change the settings below to see how shifts in party preference and turnout by different demographic groups would affect the 2016 presidential election.

By Aaron Bycoffe and David Wasserman

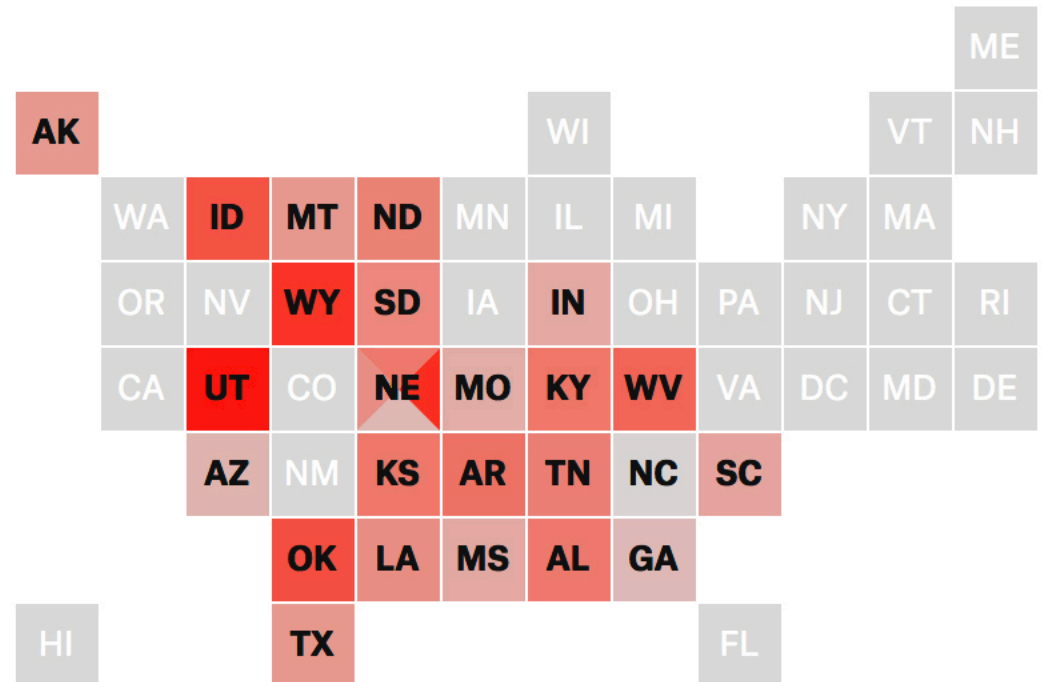
CLINTON

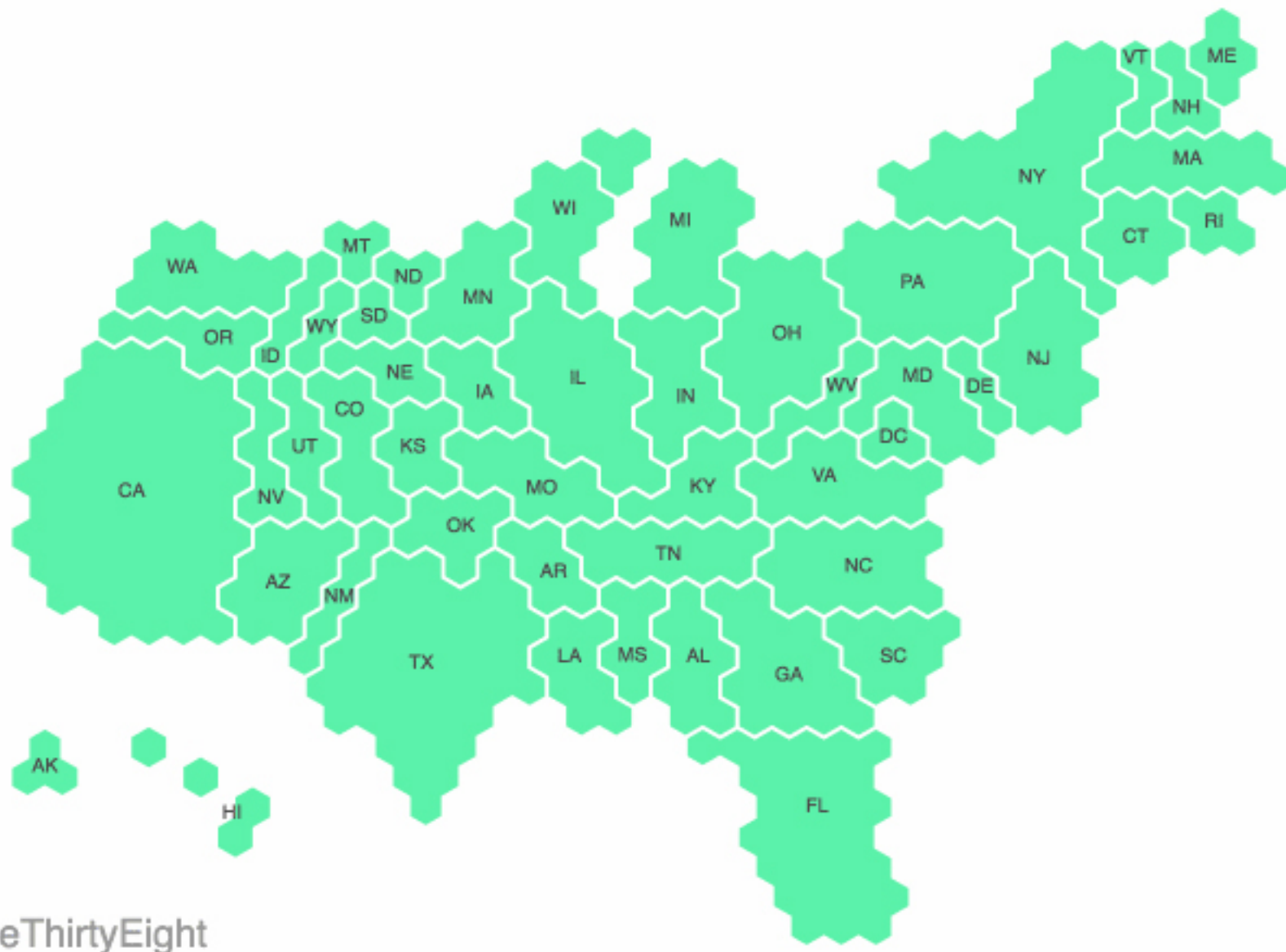
ELECTORAL VOTES: **332** ✓
POPULAR VOTE: 51.6%



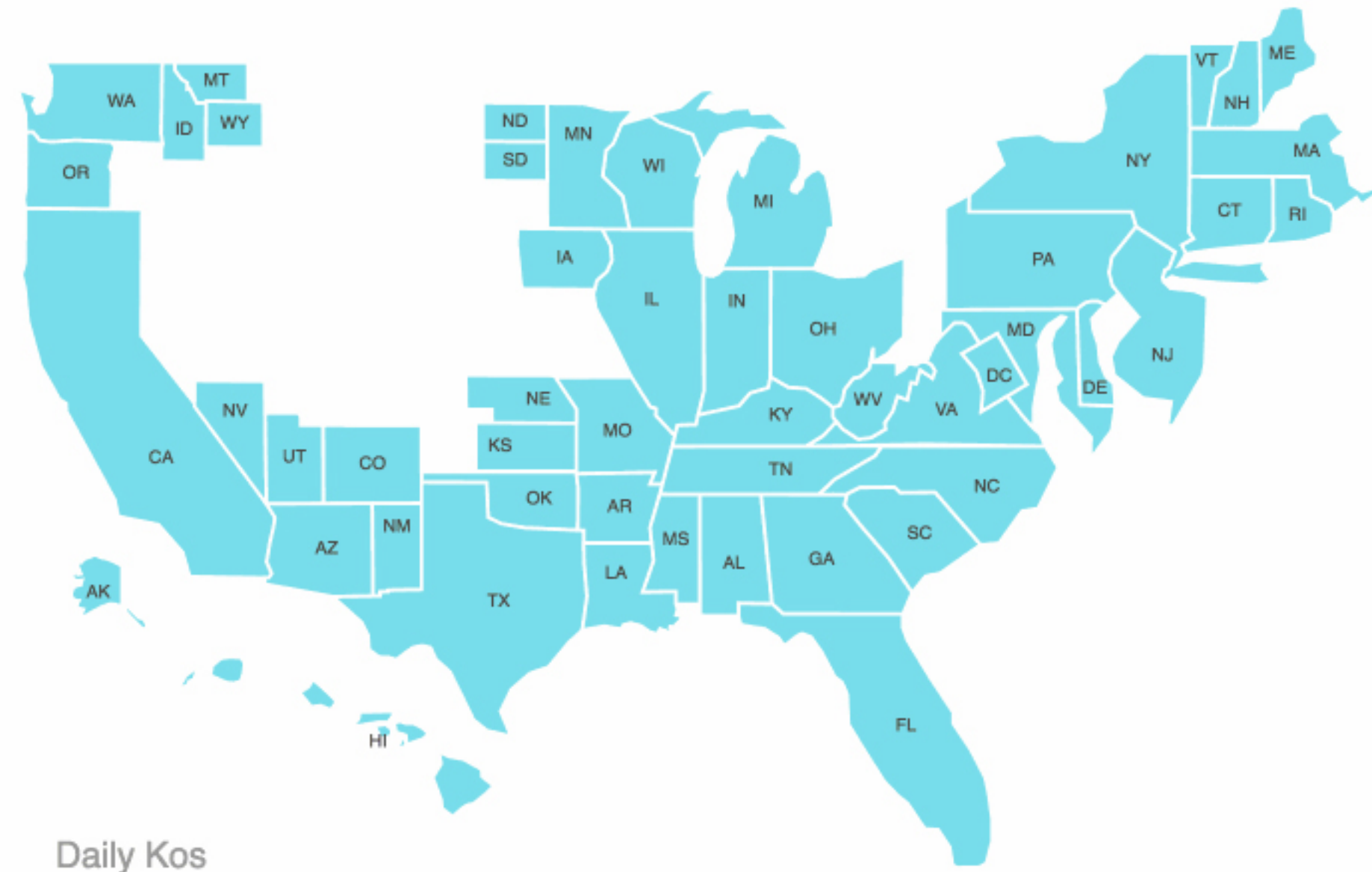
TRUMP

ELECTORAL VOTES: 206
POPULAR VOTE: 46.6%

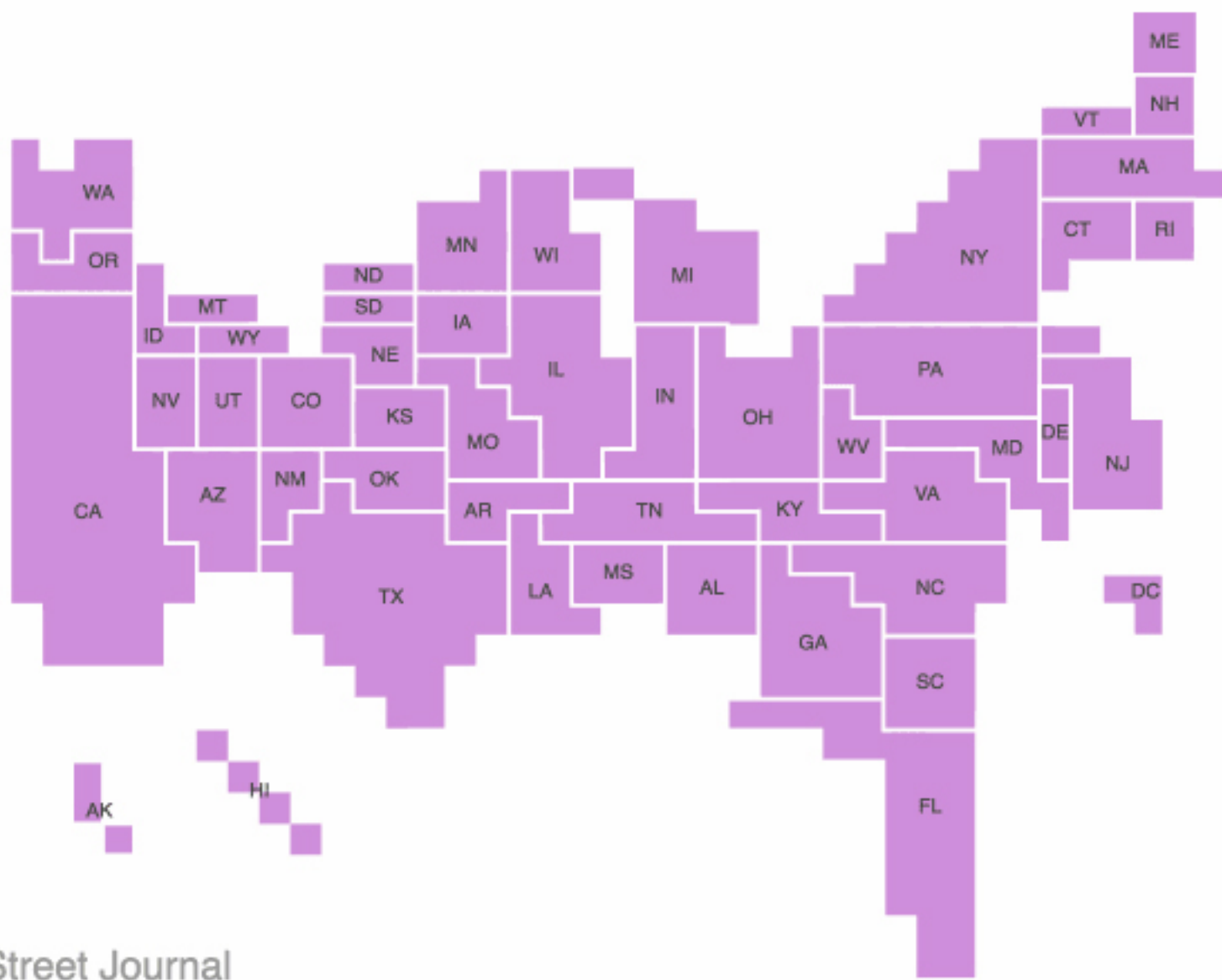




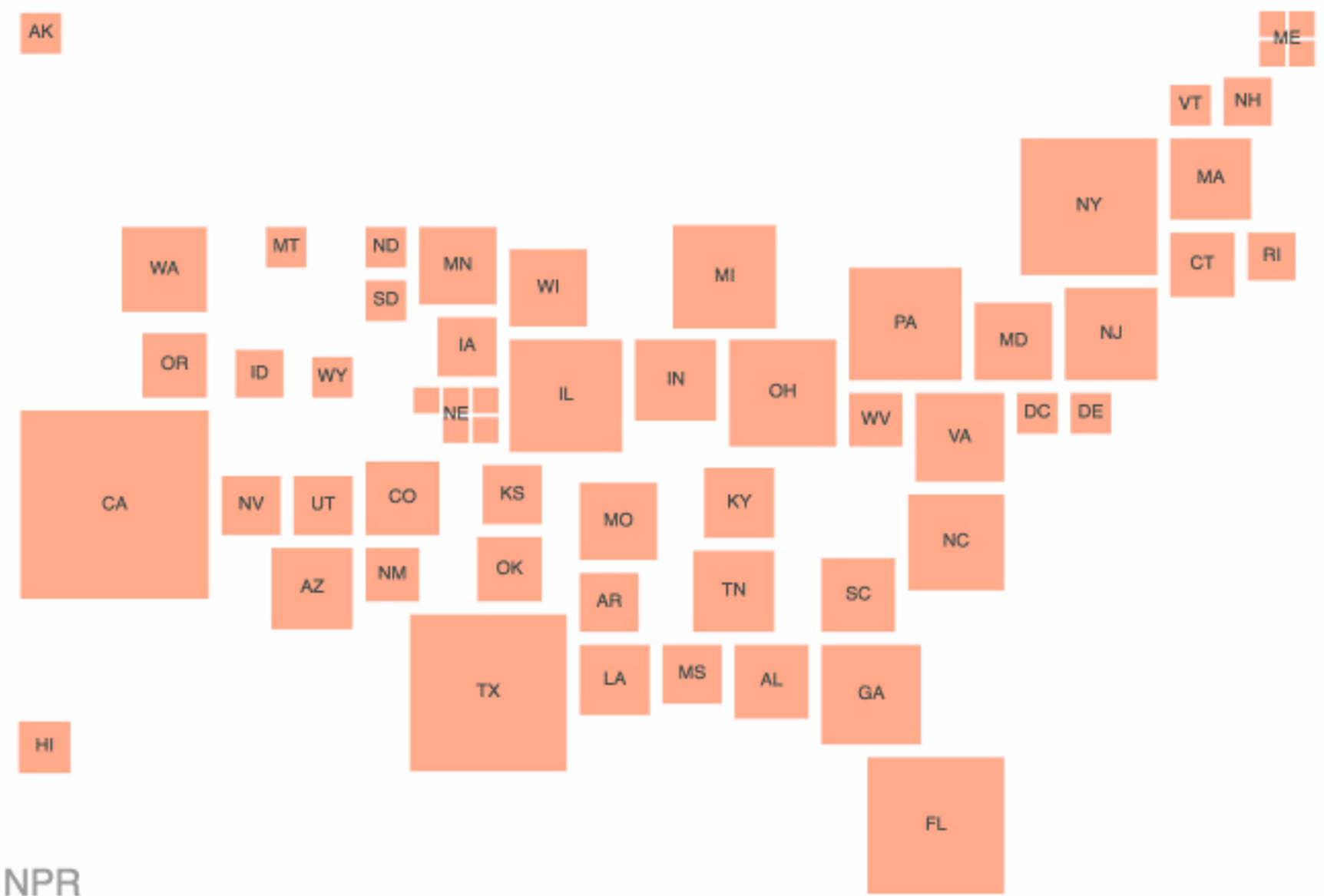
FiveThirtyEight



Daily Kos



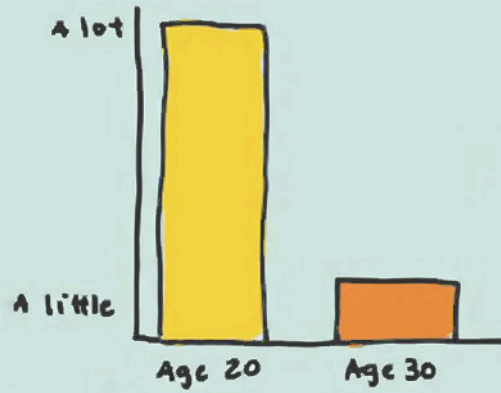
Wall Street Journal



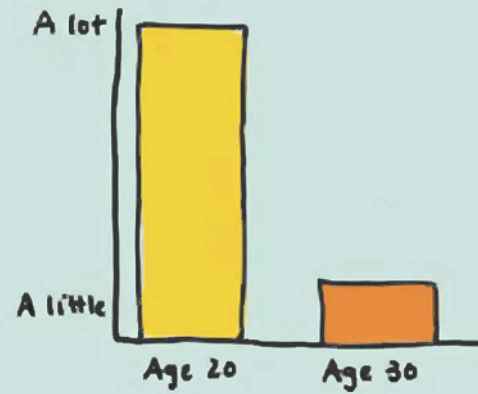
NPR

Name That Chart Form

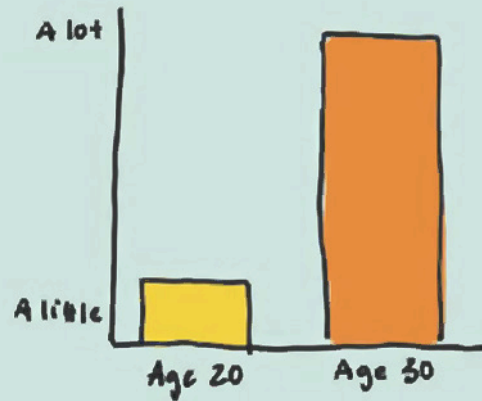
Proportion of furniture from IKEA



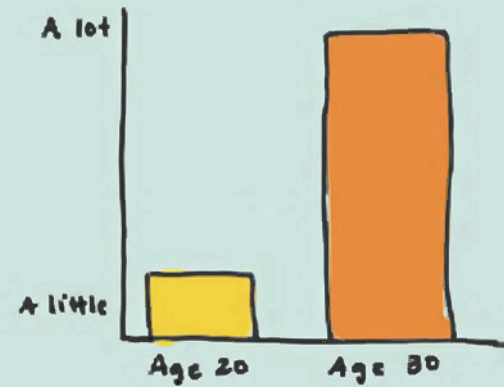
How much of a fuck I give



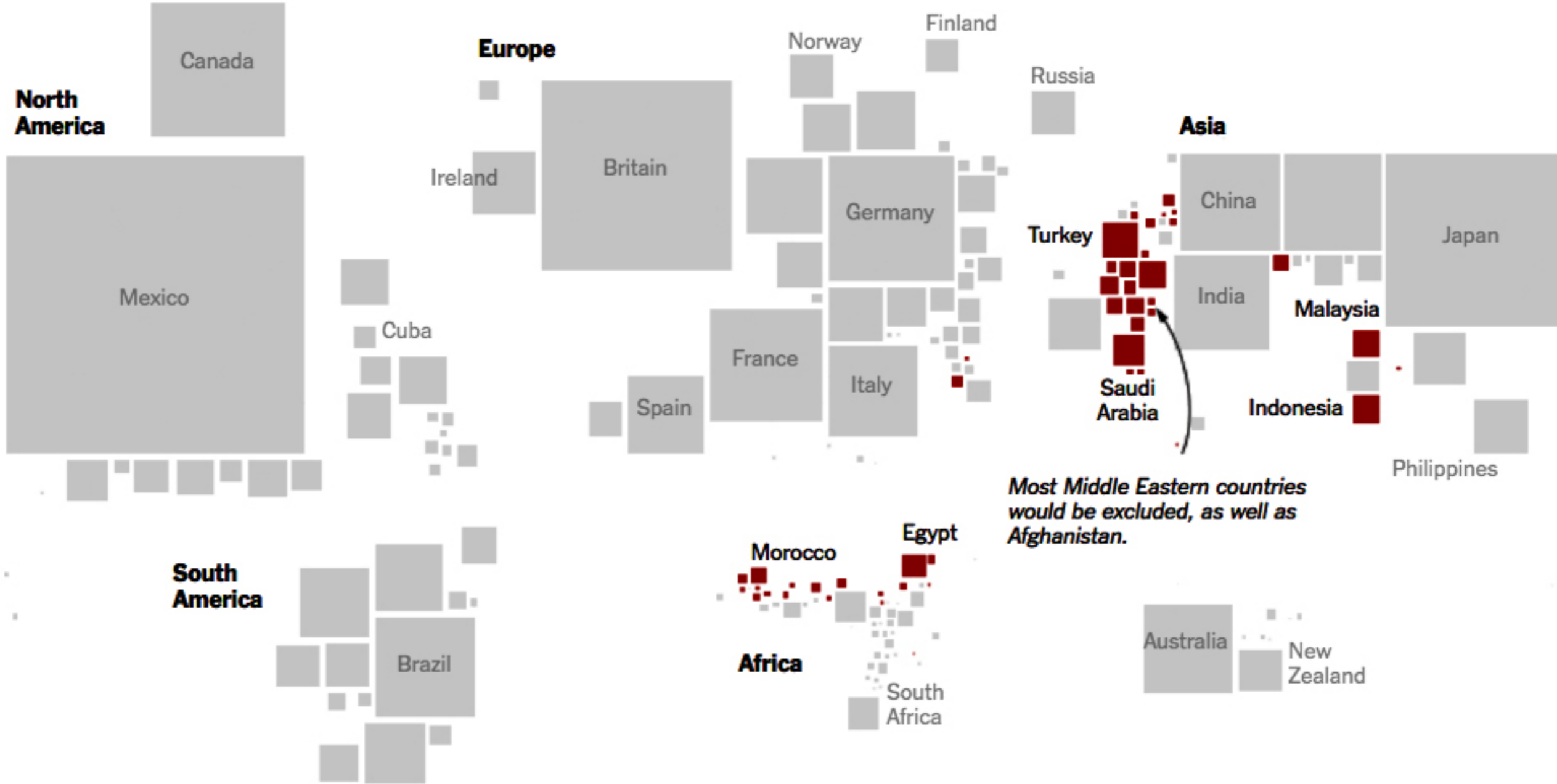
How comfortable my shoes are



How much of my parents' advice I take



Barring immigrants from **countries where more than 50 percent of the population is Muslim** would keep out about **1 million** people each year.



Most Middle Eastern countries would be excluded, as well as Afghanistan.

Squares sized by the average number of immigrants and visitors who entered the United States from that country in the last 10 years.

There are large gaps between white children and their black and Hispanic classmates. The gaps are largest in places with large economic disparities.

● White students ● Hispanic ● Black



3 grades ahead of average

2 grades ahead

1 grade ahead

About average

1 grade behind

2 grades behind

3 grades behind

← Poorer

Parents' socioeconomic status

Richer →

Drug Deaths in America Are Rising Faster Than Ever

By JOSH KATZ JUNE 5, 2017

New data compiled from hundreds of health agencies reveals the extent of the drug overdose epidemic last year.

AKRON, Ohio — Drug overdose deaths in 2016 most likely exceeded 59,000, the largest annual jump ever recorded in the United States, according to preliminary data compiled by The New York Times.

The death count is the latest consequence of an escalating public health crisis: opioid addiction, now made more deadly by an influx of illicitly manufactured fentanyl and similar drugs. Drug overdoses are now the leading cause of death among Americans under 50.

Although the data is preliminary, the Times's best estimate is that deaths rose 19 percent over the 52,404 recorded in 2015. And all evidence suggests the problem has continued to worsen in 2017.

