

VISUALIZATION AND PRESENTATION OF DATA





COURSE INTRODUCTION

This is a course about data visualization.

(Or, how to be more persuasive by making things pretty *and* accurate.)



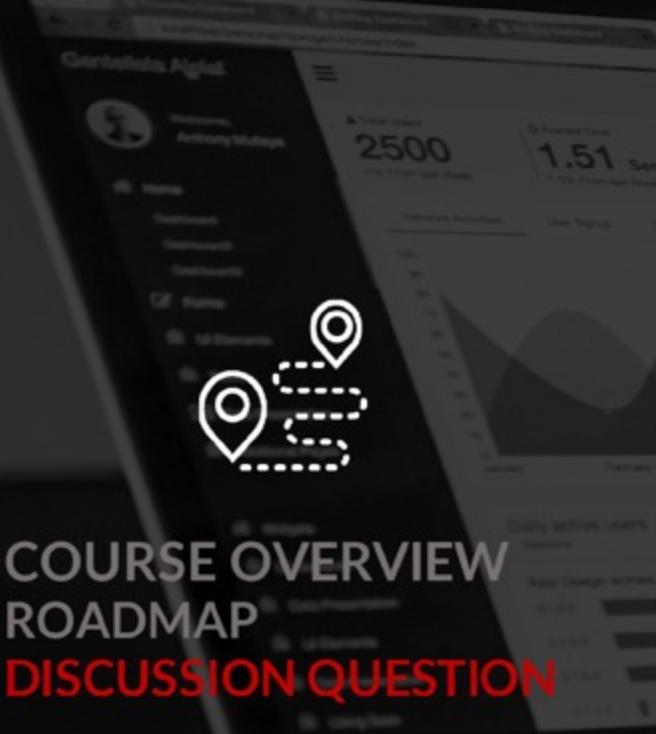
- >> COURSE OVERVIEW
- >> ROADMAP
- >> DISCUSSION QUESTION

INTRODUCTION



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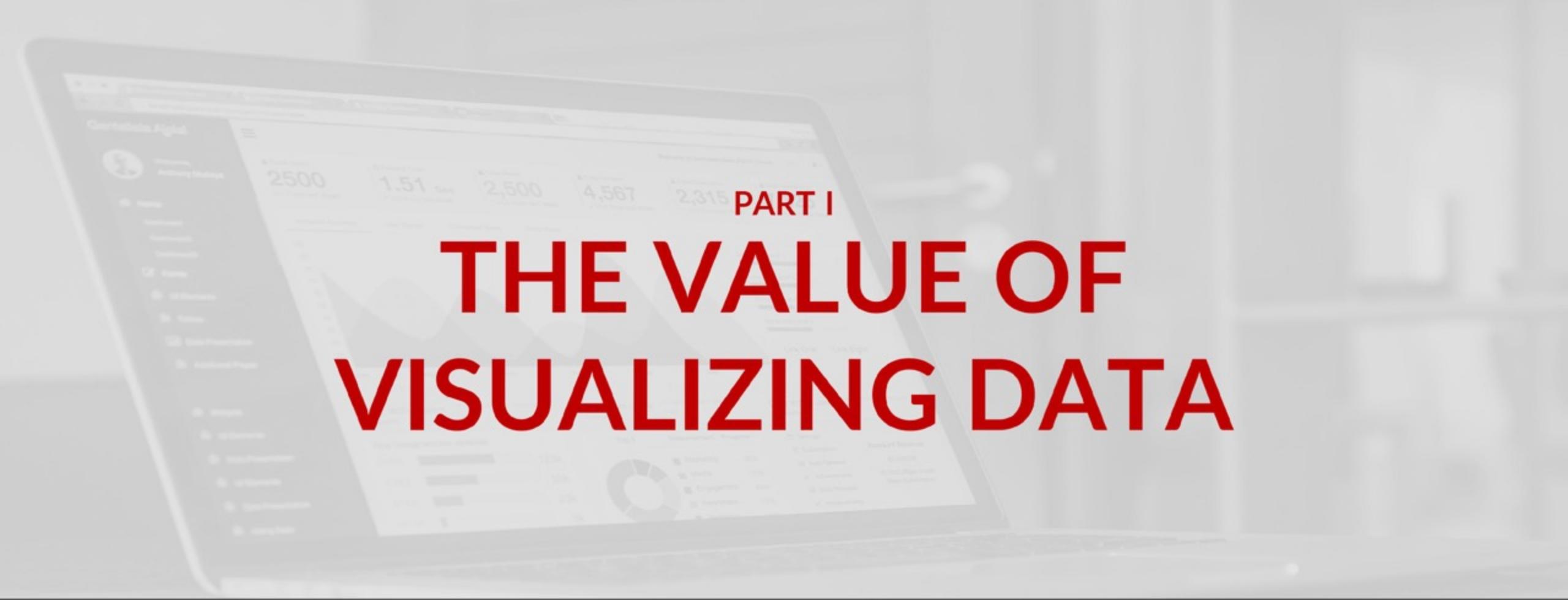
INTRODUCTION



QUESTION

What types of data do you work with in your profession? In which communication channels do you most often present this data? Presentations, reports, marketing materials, press releases, white papers, or something else?

Write your thoughts in the discussion area.



PART I

THE VALUE OF VISUALIZING DATA



- >> WHY DV MATTERS
- >> DEFINING “INFORMATION”
- >> FOUR CASE STUDIES
- >> DISCUSSION QUESTION

PART I THE VALUE OF VISUALIZING DATA

WHY DV MATTERS
DEFINING “INFORMATION”
FOUR CASE STUDIES
DISCUSSION QUESTION



Clarity



Meaning



Persuasion

PART I

THE VALUE OF VISUALIZING DATA

WHY DV MATTERS
DEFINING “INFORMATION”
FOUR CASE STUDIES
DISCUSSION QUESTION



Clarity

Data visualization brings focus to otherwise fuzzy, complex, or seemingly disconnected data.

9 5 7 9 6 4 7 3 8 1 2 5 8 4 6 3 9 1 5 7
3 1 5 9 4 3 6 7 1 2 6 8 9 5 4 7 5 6 5 7
4 2 1 3 2 5 4 1 2 3 2 5 8 6 4 7 5 6 8 8
4 7 4 2 5 7 9 6 4 7 3 8 1 2 5 8 4 6 3 9
1 5 7 3 1 5 9 4 3 6 7 1 2 6 8 9 5 4 7 5
6 5 7 4 2 1 3 2 5 4 1 2 3 2 5 8 6 4 7 5
6 8 8 4 7 4 2 5 7 9 6 4 7 3 8 1 2 5 8 4
6 3 9 1 5 7 3 1 5 9 4 3 6 7 1 2 6 8 9 5
4 7 5 6 5 7 4 2 1 3 2 5 4 1 2 3 2 5 8 6

9 5 7 9 6 4 7 3 8 1 2 5 8 4 6 3 9 1 5 7
3 1 5 6 4 3 6 7 1 2 6 8 9 5 4 7 5 6 5 7
4 2 1 3 2 5 4 1 2 3 2 5 8 6 4 7 5 6 8 8
4 7 4 2 5 7 9 6 4 7 3 8 1 2 5 8 4 6 3 9
1 5 7 3 1 5 9 4 3 6 7 1 2 6 8 9 5 4 7 5
6 5 7 4 2 1 3 2 5 4 1 2 3 2 5 8 6 4 7 5
6 8 8 4 7 4 2 5 7 9 6 4 7 3 8 1 2 5 8 4
6 3 9 1 5 7 3 1 5 9 4 3 6 7 1 2 6 8 9 5
4 7 5 6 5 7 4 2 1 3 2 5 4 1 2 3 2 5 8 6

PART I

THE VALUE OF VISUALIZING DATA

WHY DV MATTERS
DEFINING “INFORMATION”
FOUR CASE STUDIES
DISCUSSION QUESTION



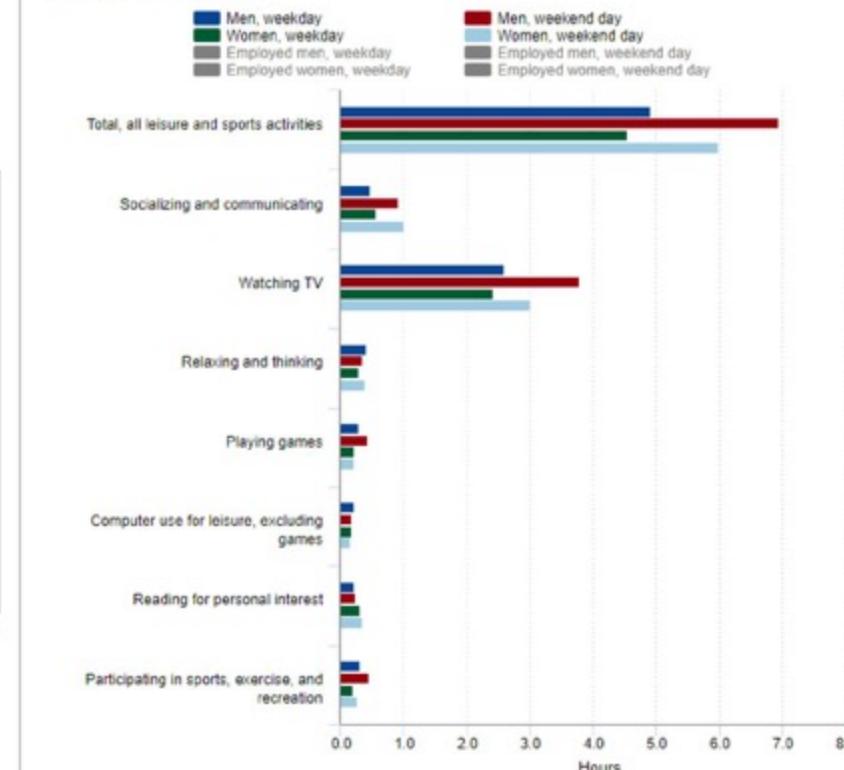
Activity	Average hours per day, civilian population			Average hours per day, employed persons			Average hours per day, all persons		
	Total	Men	Women	Total	Men	Women	Total	Men	Women
<i>Total, all activities</i>									
Personal care activities	0.00	0.00	0.00	100.0	100.0	100.0	93.0	93.0	93.0
Reading	0.30	0.20	0.40	86.9	86.9	86.9	86.9	86.9	86.9
Watching TV	0.40	0.30	0.50	81.7	81.7	81.7	81.7	81.7	81.7
Household work	0.08	0.05	0.10	6.7	6.7	6.7	7.4	7.4	7.4
Personal activities	0.01	0.00	0.01	0.8	0.8	0.8	0.7	0.7	0.7
Transportation and personal care	0.01	0.00	0.01	2.7	2.7	2.7	2.6	2.6	2.6
Eating and drinking	1.10	1.00	1.10	30.3	30.3	30.3	32.0	32.0	32.0
Housing and food preparation, eating, and drinking	0.11	0.09	0.11	2.9	2.9	2.9	3.0	3.0	3.0
Household activities	1.81	1.61	1.91	76.2	76.2	76.2	86.0	86.0	86.0
Personal care	0.00	0.00	0.00	24.5	24.5	24.5	24.5	24.5	24.5
Interior cleaning	0.20	0.10	0.30	23.1	11.7	35.0	1.02	1.02	1.02
Laundry	0.10	0.06	0.14	10.7	6.8	14.8	26.0	1.00	34.0
Food preparation and cleanup	0.40	0.30	0.50	11.4	11.4	11.4	11.4	11.4	11.4
Read and other personal reading	0.12	0.08	0.16	3.3	2.4	3.3	3.3	3.3	3.3
Relaxing and thinking	0.18	0.20	0.16	20.4	19.0	20.4	20.4	20.4	20.4
Leisure and garden care	0.18	0.20	0.11	8.7	7.4	8.0	8.0	7.6	7.6
Household management	0.00	0.00	0.00	3.3	3.3	3.3	3.3	3.3	3.3
Household use personal organization and storage	0.10	0.08	0.11	13.4	13.0	13.4	12.0	12.0	12.0
Interior maintenance, repair, and decoration	0.06	0.06	0.06	2.8	2.7	2.8	2.0	2.0	2.0
Entertainment, leisure, sports, and recreation	0.11	0.10	0.12	14.2	13.2	14.2	14.2	14.2	14.2
Animals and pets	0.11	0.10	0.11	17.6	16.7	18.4	17.0	17.0	17.0
Gardening, landscaping, and planting with plants	0.07	0.07	0.07	10.4	10.4	10.4	10.4	10.4	10.4
Vehicle	0.04	0.07	0.01	7.2	7.2	7.2	6.7	6.7	6.7
Appliance, tools, and toys	0.02	0.00	0.00	1.8	2.1	1.8	0.0	0.0	0.0
Performing arts and services	0.02	0.00	0.00	1.0	0.0	1.0	0.0	0.0	0.0
General household	0.11	0.08	0.14	16.1	16.1	16.1	16.1	16.1	16.1
Professional and personal care services	0.08	0.07	0.02	4.0	4.0	4.0	3.7	3.7	3.7
Food preparation and eating	0.08	0.06	0.08	12.2	12.2	12.2	12.2	12.2	12.2
Bedroom and home services	0.05	0.05	0.06	3.7	3.7	3.7	3.7	3.7	3.7

Bureau of Labor Statistics | American Time Use Survey 2017

Meaning

Data visualization turns abstract numbers and data into things from which we can compare and draw conclusions.

Average hours per day spent in selected leisure and sports activities by sex, employment status, and day, 2017 annual averages



Hover over chart to view data.
Source: U.S. Bureau of Labor Statistics.

PART I

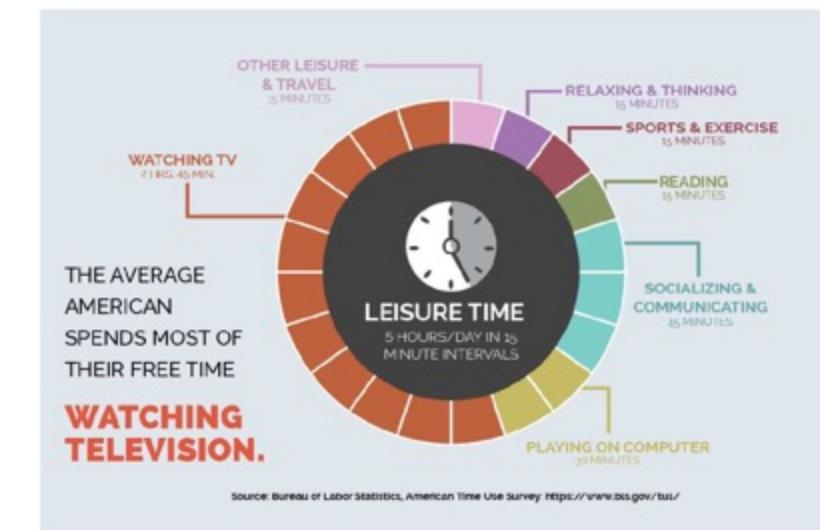
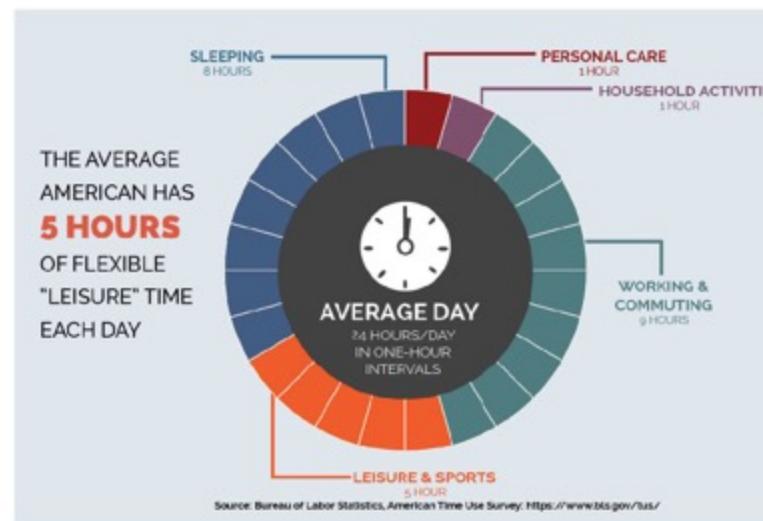
THE VALUE OF VISUALIZING DATA

WHY DV MATTERS
DEFINING “INFORMATION”
FOUR CASE STUDIES
DISCUSSION QUESTION



Persuasion

Data visualization helps persuade people to do something with the data—conduct more research, change a behavior, or think in a new way.

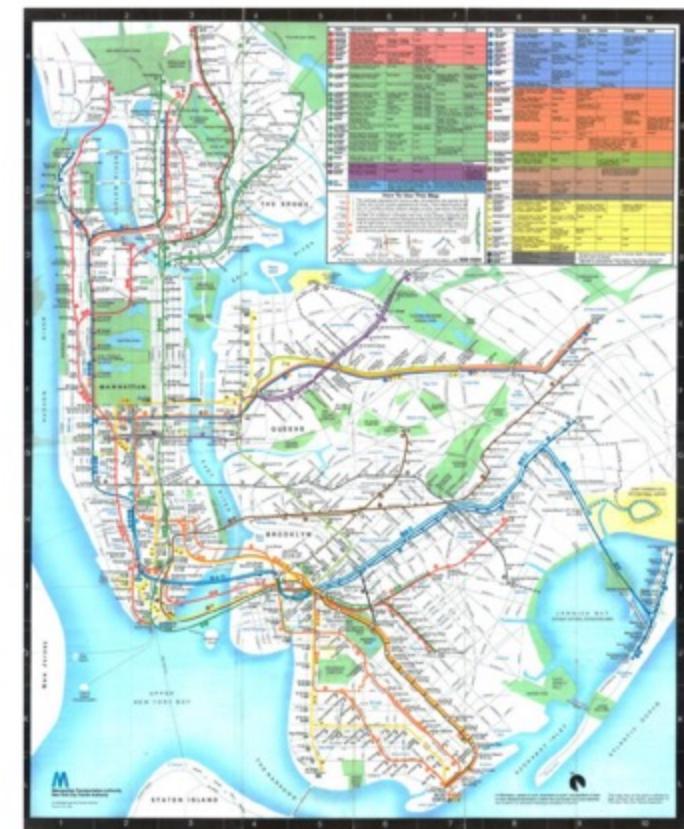


ACT I/V INTRODUCTION



WHY DV MATTERS
DEFINING “INFORMATION”
FOUR CASE STUDIES
DISCUSSION QUESTION

**All information should be viewed as either
persuasive or dissuasive**
(as map designer Massimo Vignelli could tell you)



ACT I/V INTRODUCTION



Information

Useful, meaningful,
and accurate.

Misinformation

Well-intentioned
but inaccurate.

Disinformation

Intentionally
misleading.

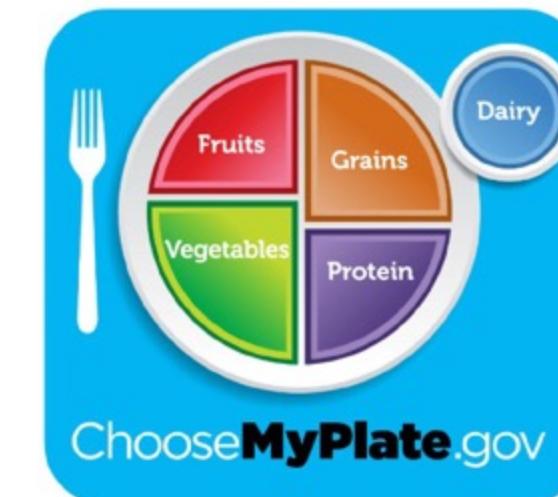
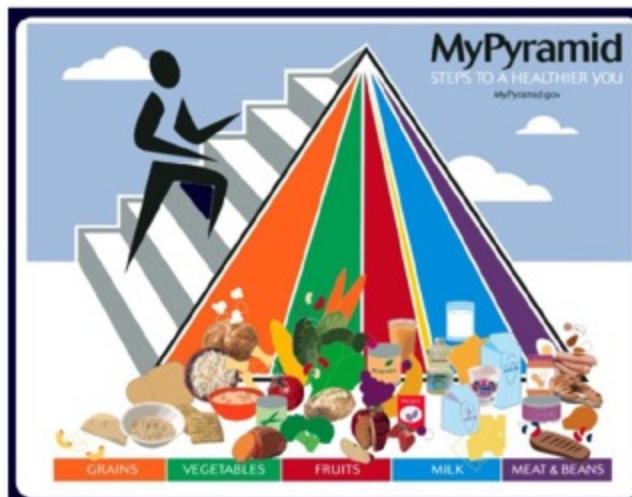
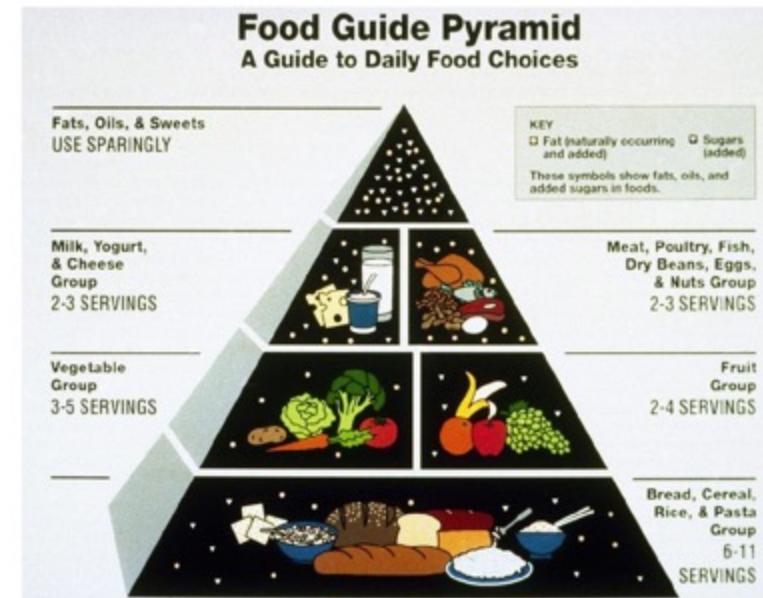
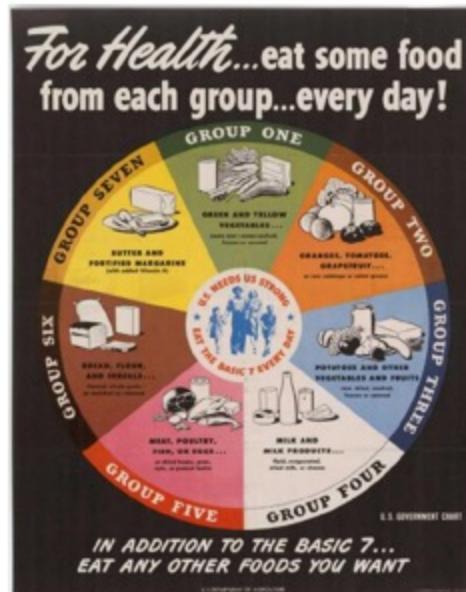
As business professionals, scientists, and subject-matter experts, we have a responsibility to provide accurate, useful, and meaningful information.

But sometimes that's easier said than done...

ACT I/IV INTRODUCTION

WHY DV MATTERS
DEFINING “INFORMATION”
FOUR CASE STUDIES
DISCUSSION QUESTION

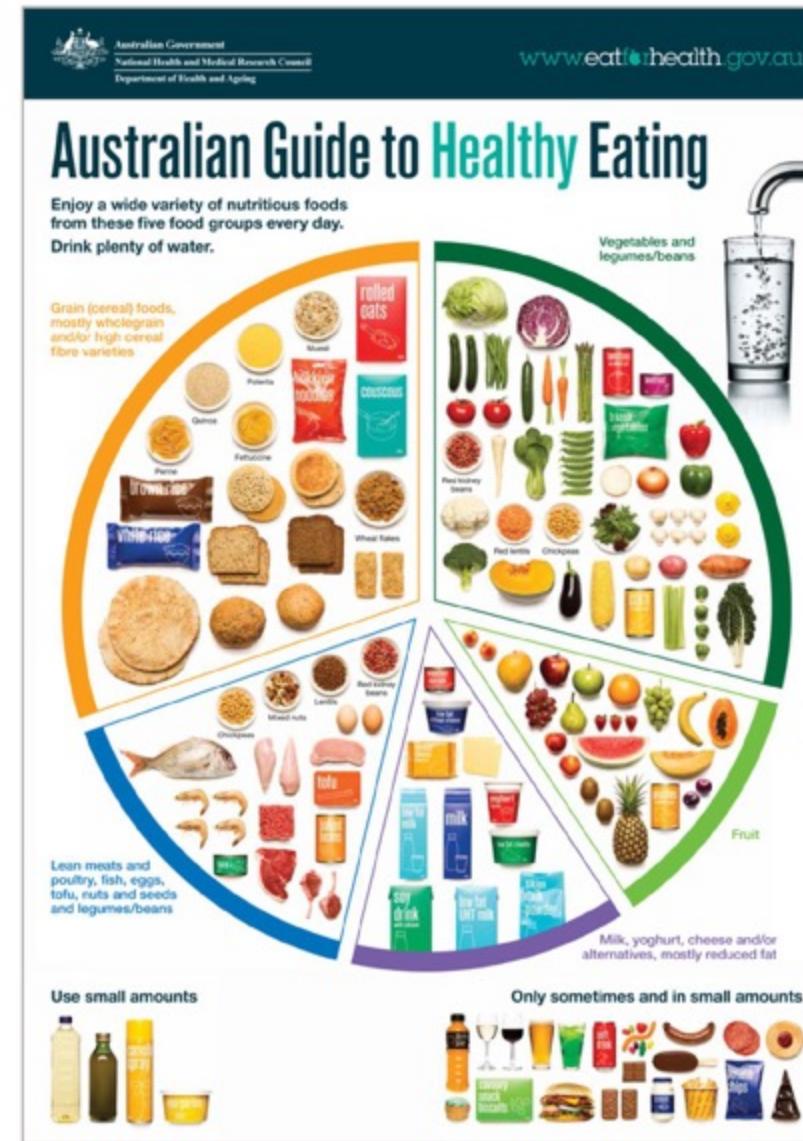
Case Study #1: The U.S. Food Guide



ACT I/V INTRODUCTION

WHY DV MATTERS.
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DISCUSSION QUESTION

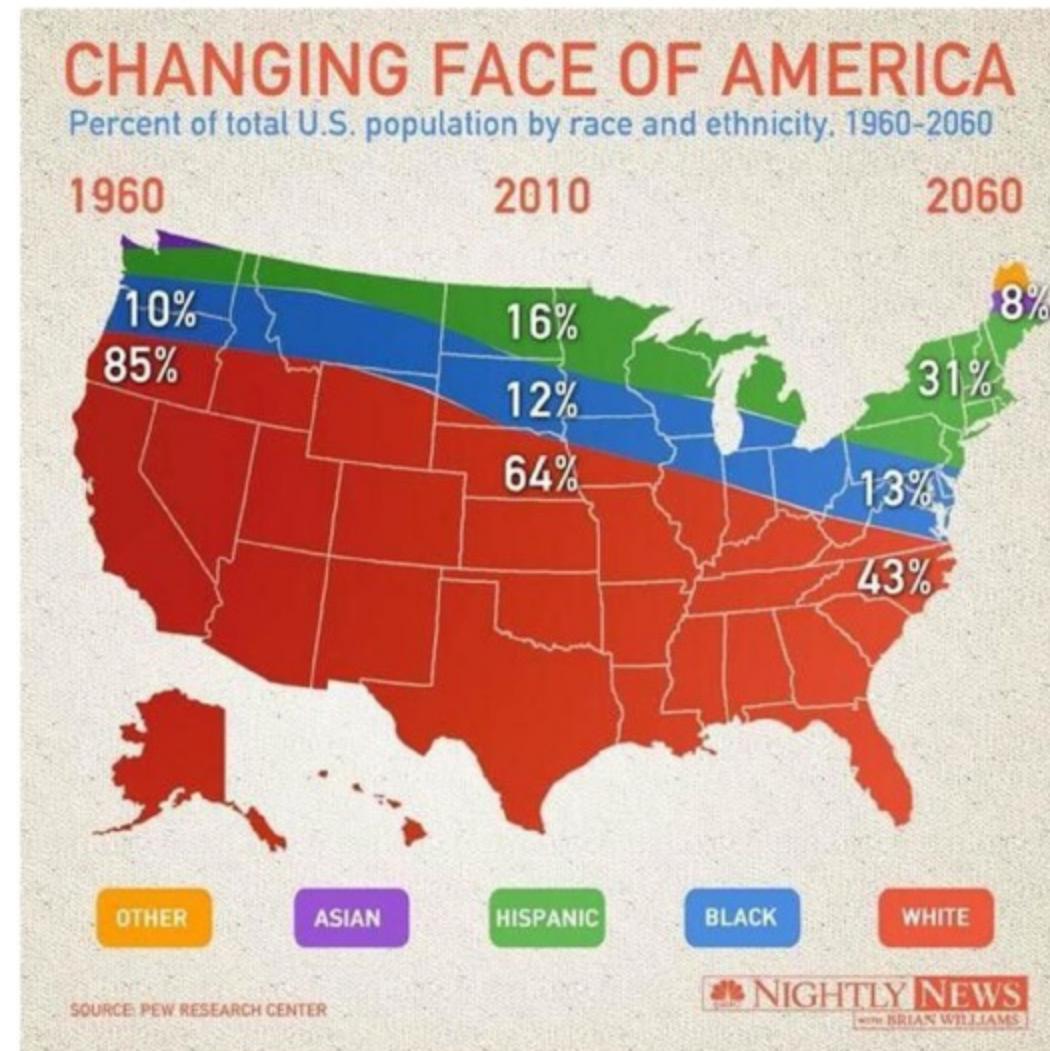
Case Study #1: Solution?



ACT I/V INTRODUCTION

WHY DV MATTERS.
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DISCUSSION QUESTION

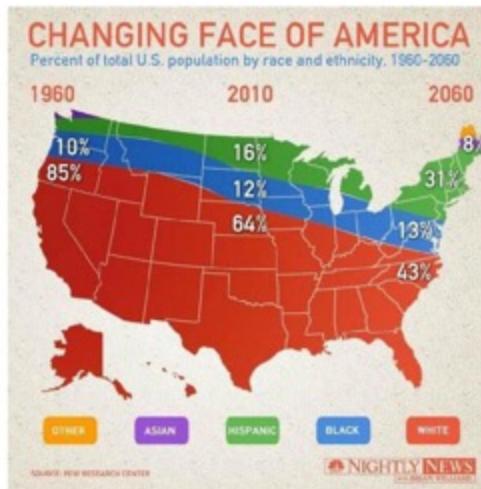
Case Study #2: NBC Nightly News



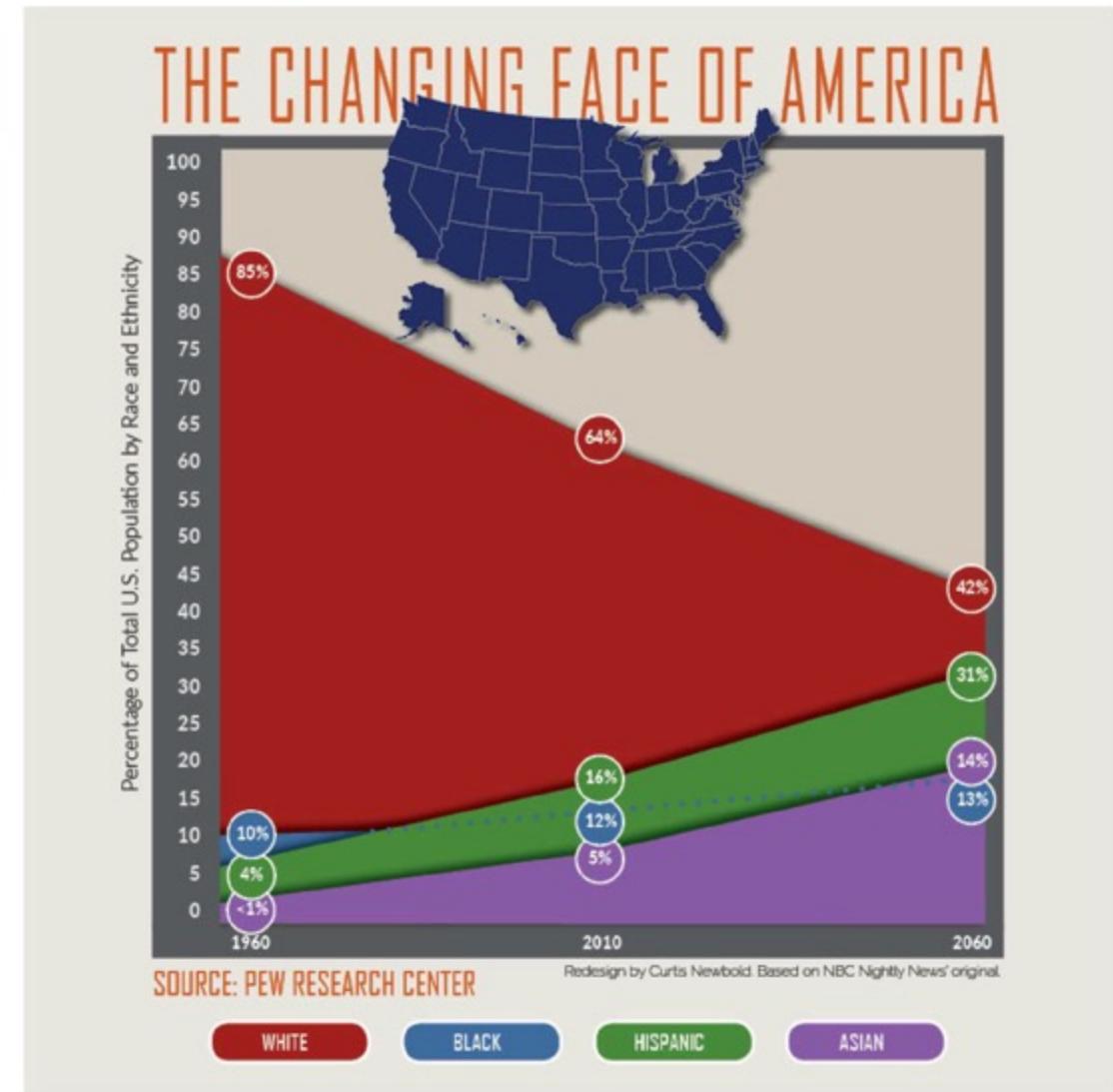
ACT I/V INTRODUCTION

WHY DV MATTERS.
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Case Study #2: Redesign



A map (above) inappropriately communicates location. For this data set, which compares multiple pieces of data over time, an area graph (right) is a better choice.



ACT I/V INTRODUCTION

WHY DV MATTERS.
DEFINING “INFORMATION”
FOUR CASE STUDIES
DISCUSSION QUESTION

Case Study #3: Fox News Media



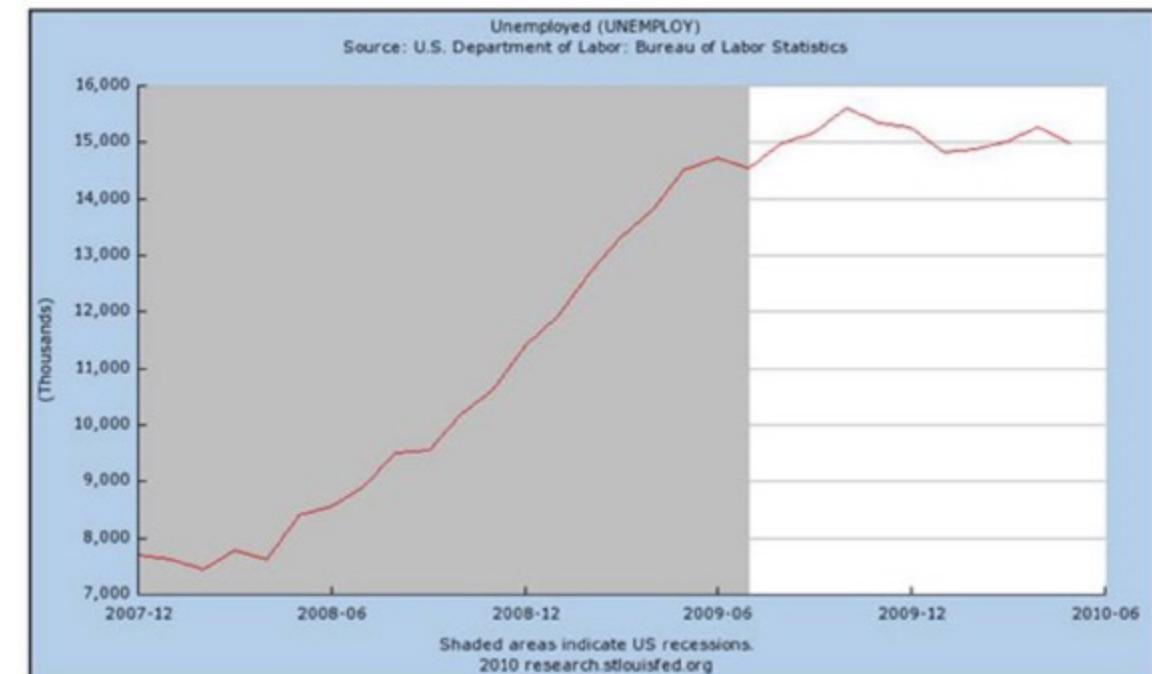
ACT I/V INTRODUCTION

WHY DV MATTERS
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DISCUSSION QUESTION

Case Study #3: Fox News Media



The straight line in the graphic above is deceptive, telling a story that doesn't convey the entire picture. This is likely a manipulative attempt to create disinformation.



ACT I/V INTRODUCTION

WHY DV MATTERS.
DEFINING "INFORMATION"
FOUR CASE STUDIES
DISCUSSION QUESTION

Case Study #4: USA Today

When we communicate information, it's important we understand it first. Mistakes can be misleading, confusing, and embarrassing.

COLORADO MARIJUANA SMUGGLING

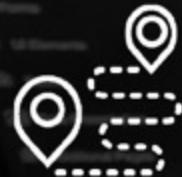
Authorities say they've intercepted thousands of shipments of marijuana leaving Colorado, destined for sale on the black market in other states.



SOURCES: El Paso Intelligence Center,
National Seizure System, as of March 20, 2015
Janet Loehrke, USA TODAY



ACT I/V INTRODUCTION



WHY DV MATTERS
DEFINING “INFORMATION”
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DISCUSSION QUESTION

QUESTION

Cole Nusbaumer, in her bestselling book *Storytelling with Data*, describes an informal Twitter survey she conducted where she asked her followers this question: “when someone asks me to ‘show’ them the data, I feel _____.”

Let’s do a similar informal survey here. Fill in the blank:

When I am asked to visualize information and I know that it’s important I’m accurate, professional, and persuasive, I feel _____.

Write your thoughts in the discussion area.

PART II

THE SIX QUESTIONS



- >> PART II OVERVIEW
- >> KNOW HOW YOUR DATA FITS
- >> ASK SIX QUESTIONS
- >> SELECT FROM AVAILABLE OPTIONS
- >> DISCUSSION QUESTION

PART II/V THE SIX QUESTIONS

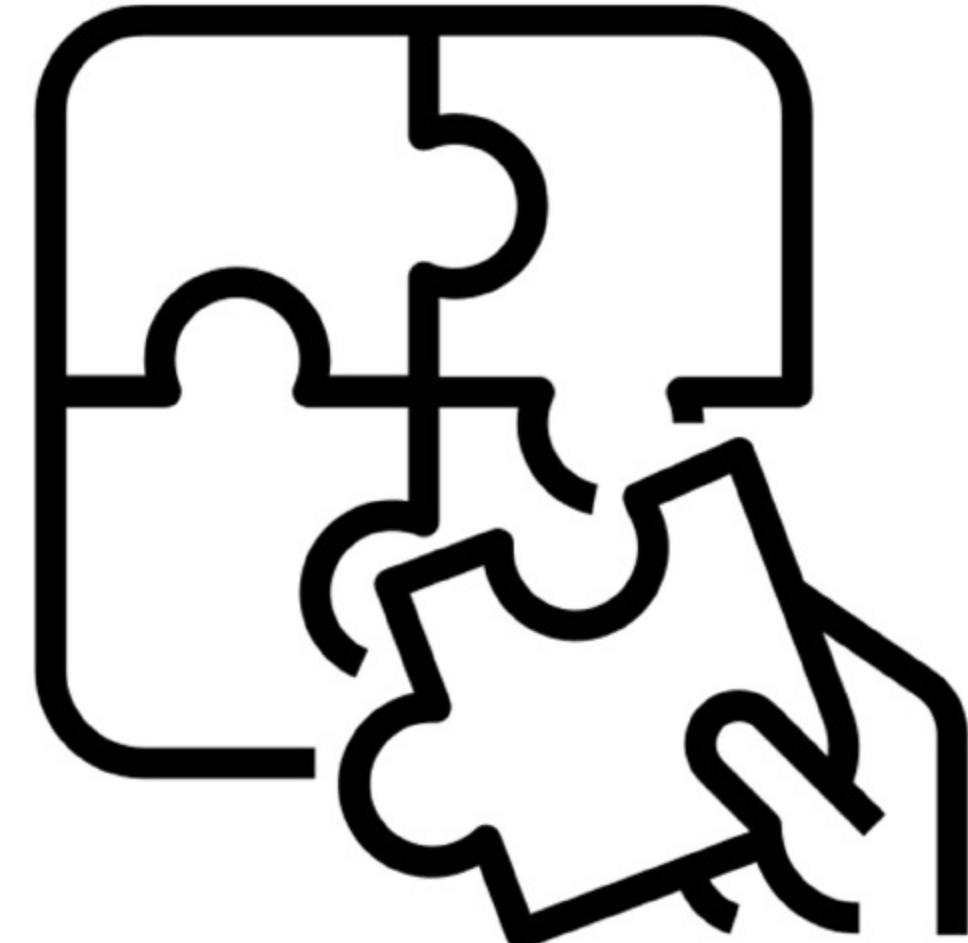
PART II OVERVIEW
KNOW HOW IT FITS
ASK SIX QUESTIONS
SELECT BEST OPTION
DISCUSSION QUESTION

Step #1: Know How Your Data Fits

Data is like a puzzle—multiple pieces that tell a greater story.

Not all data sets require all pieces to be included. Can you effectively (and ethically) communicate by leaving pieces out?

Use only what is necessary to highlight the most important thing.



Icon made by FreePik via Flaticon.com

PART II/V THE SIX QUESTIONS



Step #2: Ask Six Questions



Am I highlighting just
ONE IMPORTANT FACT?



Am I making a
**COMPARISON BETWEEN
TWO OR MORE THINGS?**



Am I describing how the
**PARTS RELATE TO A
WHOLE?**



Am I showing how
**ONE PIECE OF DATA
CHANGES AS ANOTHER
DOES?**



Am I showing the results of
**A SURVEY OR
QUESTIONNAIRE?**



Does my data even need a graph?
**ARE WORDS, PICTURES,
DIAGRAMS, or ILLUSTRATIONS
BETTER?**

PART II/V THE SIX QUESTIONS

PART II OVERVIEW
KNOW HOW IT FITS
ASK SIX QUESTIONS
SELECT BEST OPTION
DISCUSSION QUESTION

Step #3: Choose the Best Option

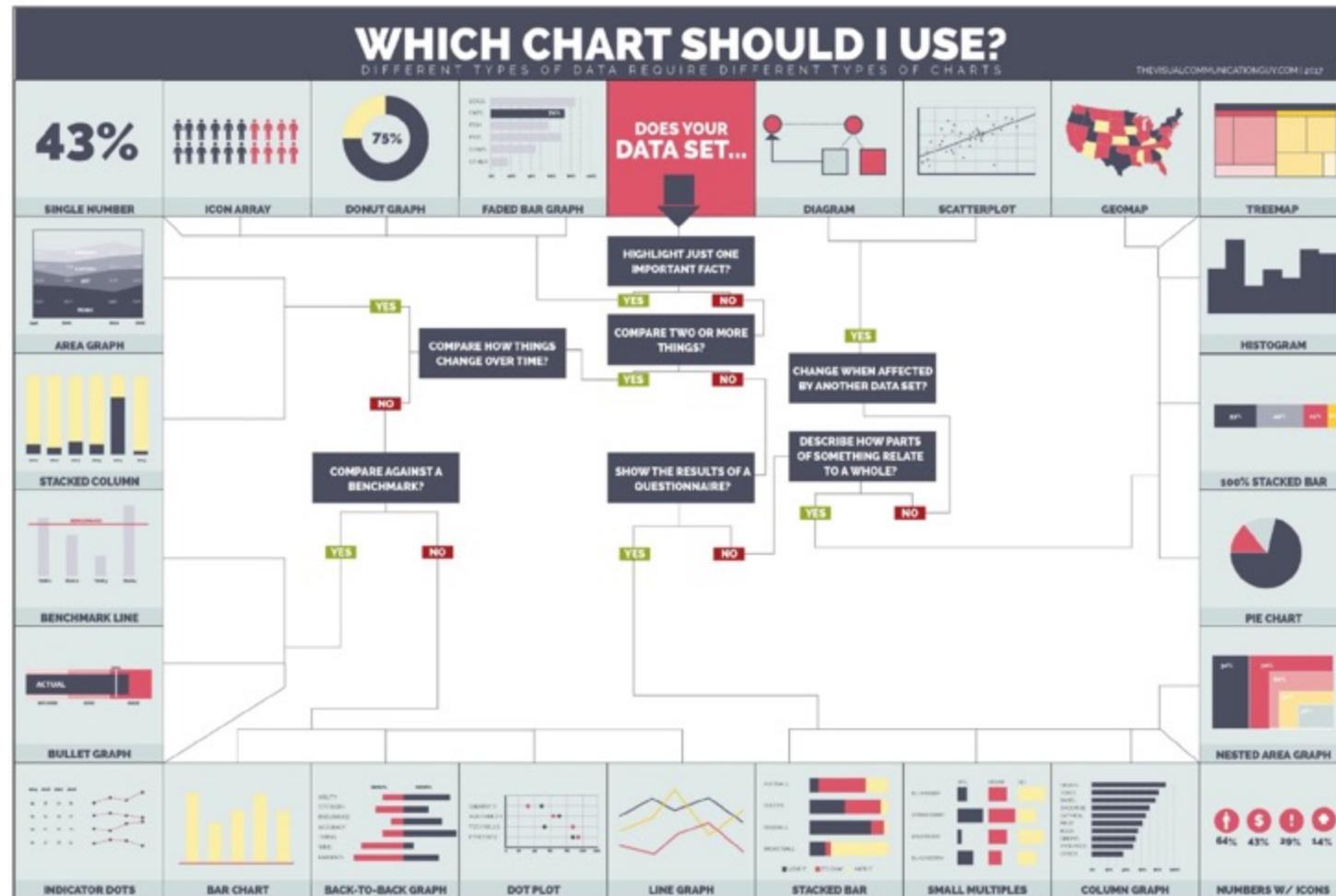
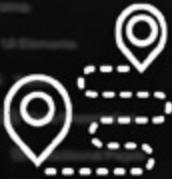


Chart designed by Curtis Newbold | View this graphic at <https://thevisualcommunicationguy.com/2017/06/05/which-chart-should-i-use/>

PART II/V THE SIX QUESTIONS



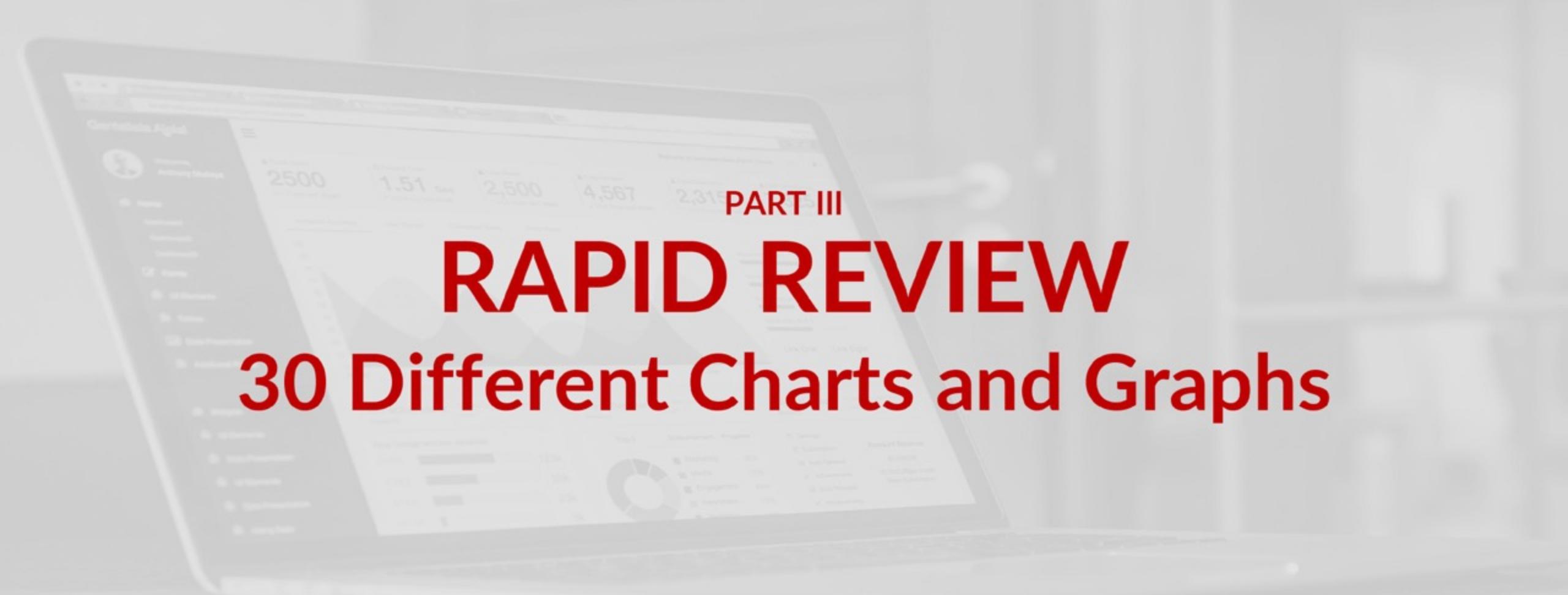
PART II OVERVIEW
KNOW HOW IT FITS
ASK SIX QUESTIONS
SELECT BEST OPTION
DISCUSSION QUESTION

QUESTION

Which type of data do you feel like you need to visualize the most?

- One important fact
- Comparisons
- Surveys and Questionnaires
- Parts of a whole (or percentages)
- When one piece of data affects another
- Qualitative and word-based information

Which do you find to be the most challenging?



PART III

RAPID REVIEW

30 Different Charts and Graphs



- >> ONE IMPORTANT FACT
- >> COMPARISONS
- >> SURVEYS & QUESTIONNAIRES
- >> PART(S) OF A WHOLE
- >> ONE IMPACTS ANOTHER
- >> WHEN GRAPHS AREN'T BEST

PART III/V RAPID REVIEW

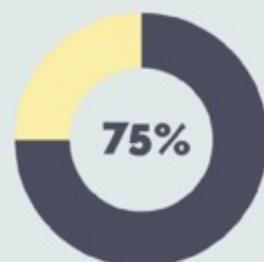


AM I EMPHASIZING ONE IMPORTANT FACT? | Options

43%

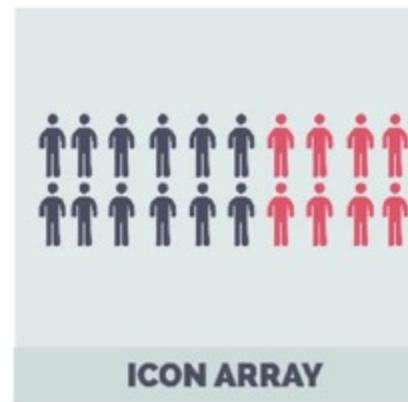
SINGLE NUMBER

A single number or fact, emphasized with bigger, bolder, and more colorful text. Good to draw attention; useful in infographics and slide decks.



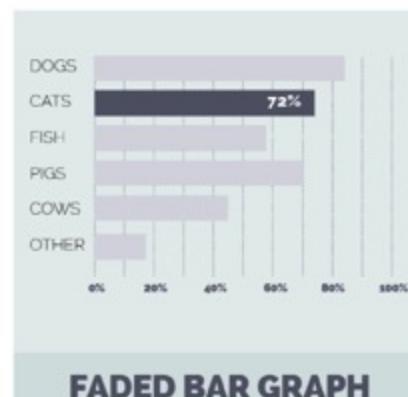
DONUT GRAPH

Like a pie chart, but attention is drawn to a single percentage. A more visual alternative to the single number option above.



ICON ARRAY

The use of icons that visually represent your data, emphasizing a number or percentage within a group. Good for dramatic data.



FADED BAR GRAPH

A comparison that draws attention to one fact or percentage. Good for presentation when emphasis is key.

PART III/V RAPID REVIEW

ONE IMPORTANT FACT
COMPARISONS
SURVEYS & QUESTIONNAIRES
PARTS OF A WHOLE
ONE IMPACTS ANOTHER
WHEN GRAPHS AREN'T BEST

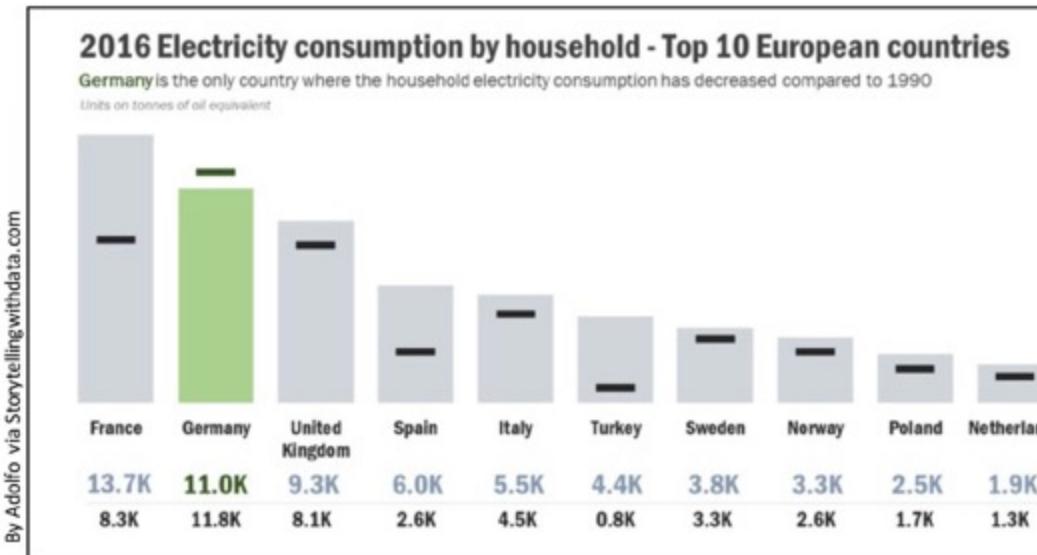
Designed and published by [thevisualcommunicationguy.com](#)



AM I EMPHASIZING ONE IMPORTANT FACT? | Examples



Icon Array



Faded Bar Graph



Single Number



Donut Graph

PART III/V RAPID REVIEW



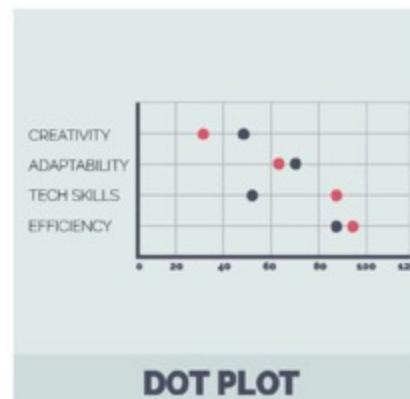
AM I MAKING **COMPARISONS?** | Options

General Comparisons



BAR CHART

Best for comparing multiple pieces of data, side-by-side. One of the most common and versatile graphs.



DOT PLOT

Good for showing how two or more groups compare across measurable goals, like test scores.



BACK-TO-BACK GRAPH

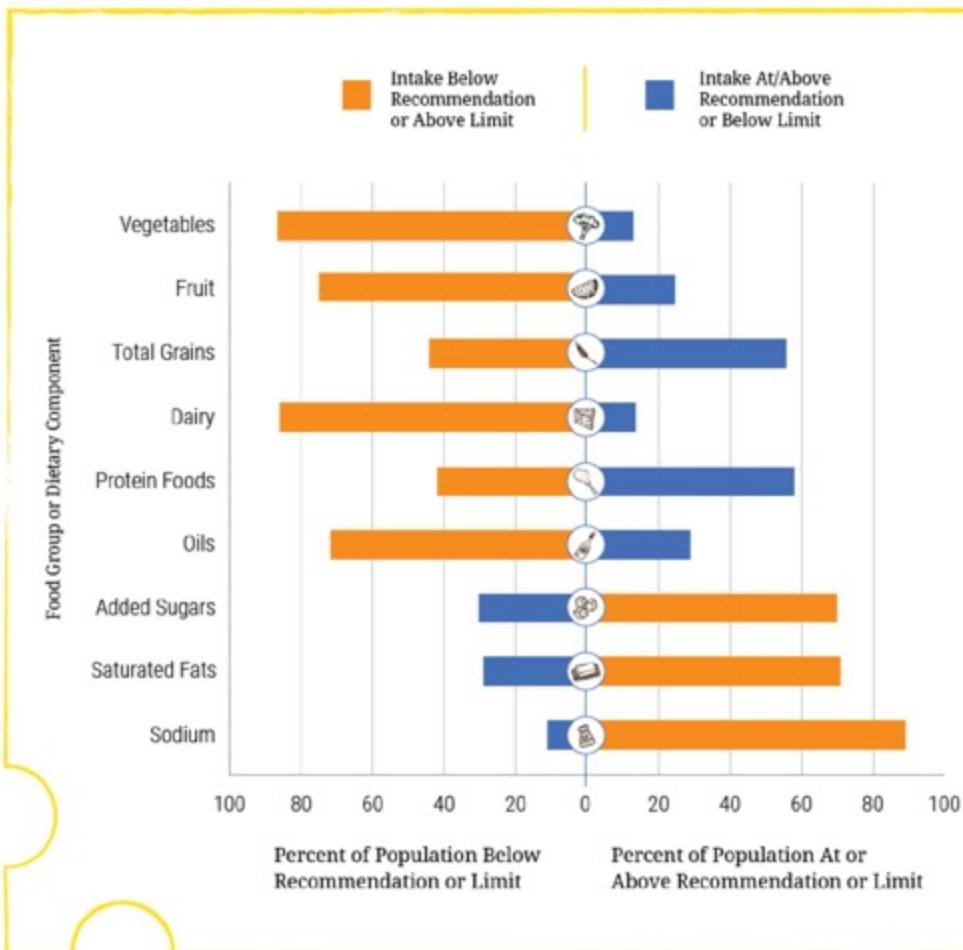
Best for comparing two groups (like male and female or teachers and students) against several variables.

PART III/V RAPID REVIEW

ONE IMPORTANT FACT
COMPARISONS
SURVEYS & QUESTIONNAIRES
PARTS OF A WHOLE
ONE IMPACTS ANOTHER
WHEN GRAPHS AREN'T BEST

AM I MAKING COMPARISONS? | Examples

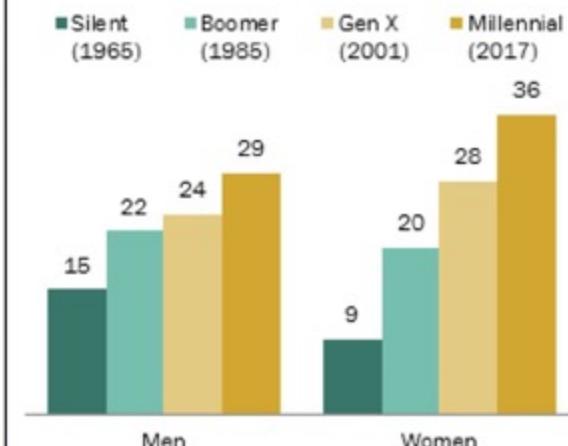
General Comparisons



Source: health.gov

As young adults, Millennials more educated than previous generations

% of those ages 21 to 36 who have completed at least a bachelor's degree, by gender



Note: The educational attainment question was changed in 1992. For Boomers and Silents, the share shown refers those who completed at least four years of college (regardless of degree status).

Source: Pew Research Center tabulations of the 1965, 1985, 2001 and 2017 Current Population Survey Annual Social and Economic Supplement (ASEC) from the Integrated Public Use Microdata Series (IPUMS).

PEW RESEARCH CENTER

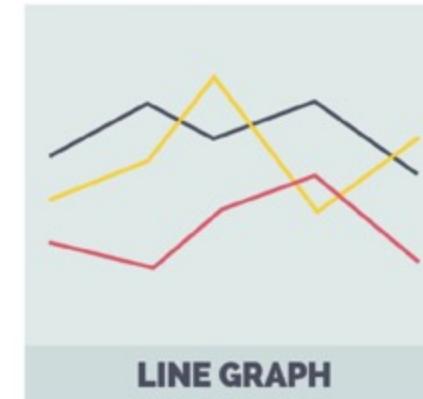
Source: pewresearch.org

PART III/V RAPID REVIEW



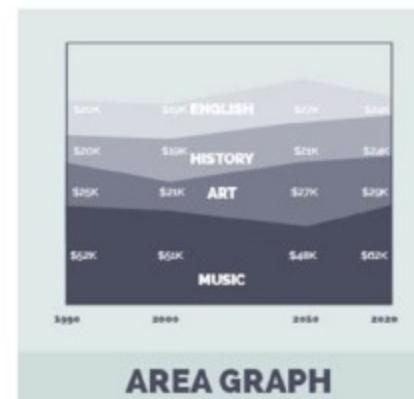
AM I MAKING **COMPARISONS?** | Options

Comparisons Over Time



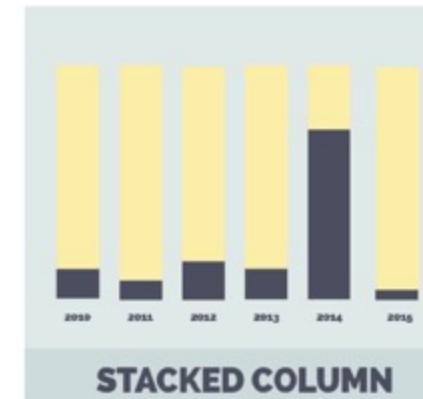
LINE GRAPH

Good for showing multiple trends over time, with several variables.



AREA GRAPH

Similar to a line graph, but more visually emphatic (best when variables don't overlap)



STACKED COLUMN

Good for making simple comparisons within defined time frames (like months or years) when you have multiple categories that are part of a whole.

PART III/V RAPID REVIEW

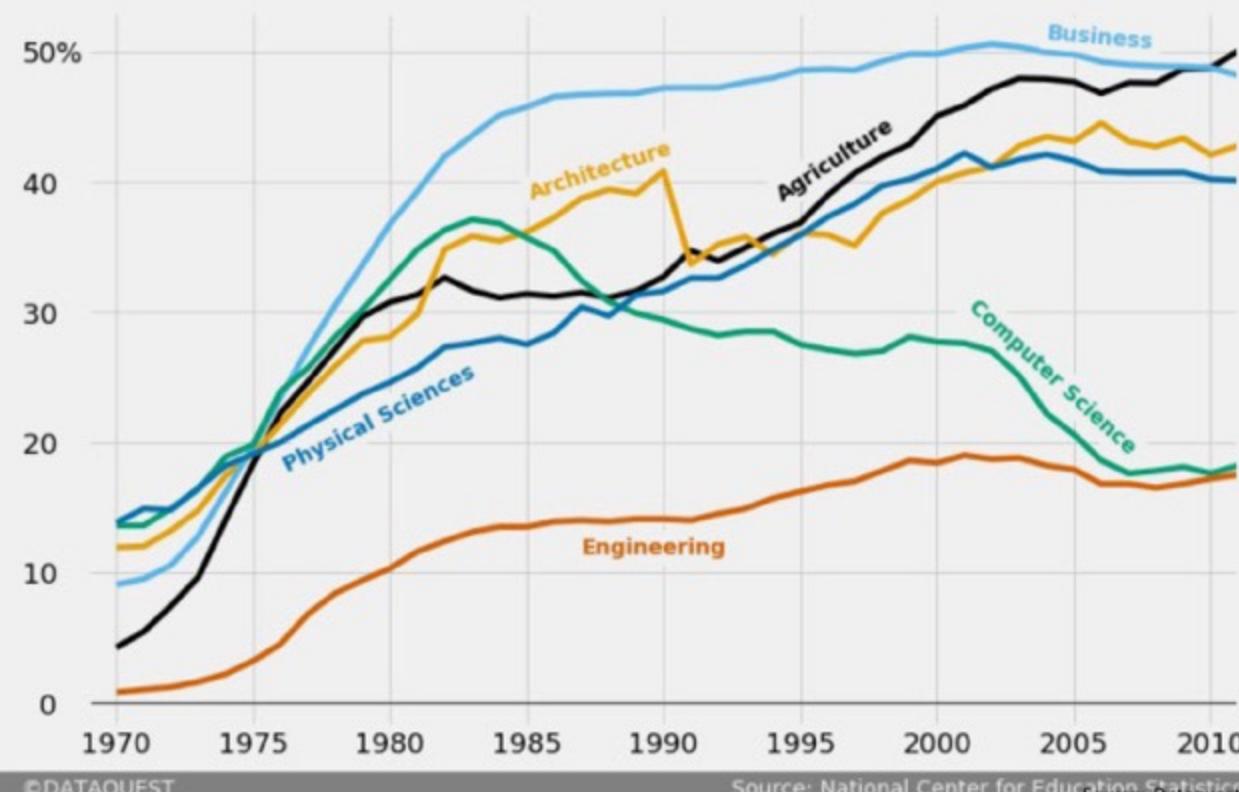


AM I MAKING **COMPARISONS?** | Examples

Comparisons over Time

The gender gap is transitory - even for extreme cases

Percentage of Bachelors conferred to women from 1970 to 2011 in the US for extreme cases where the percentage was less than 20% in 1970



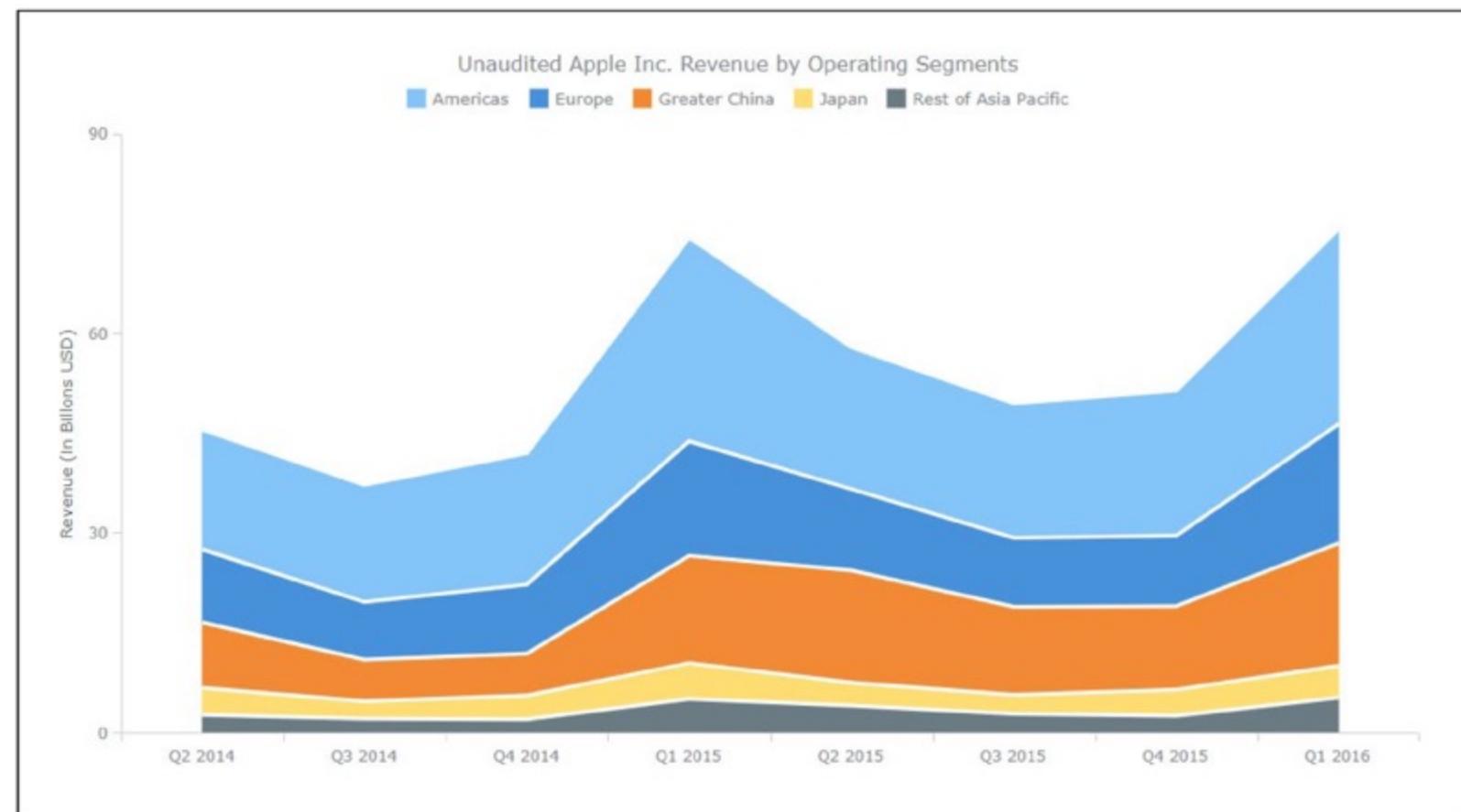
PART III/V RAPID REVIEW



AM I MAKING COMPARISONS? | Examples



Comparisons over Time



Source: anygraph.com

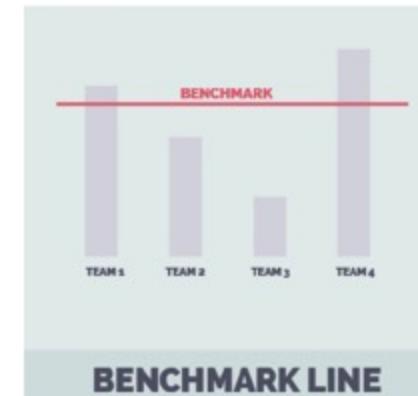
PART III/V RAPID REVIEW



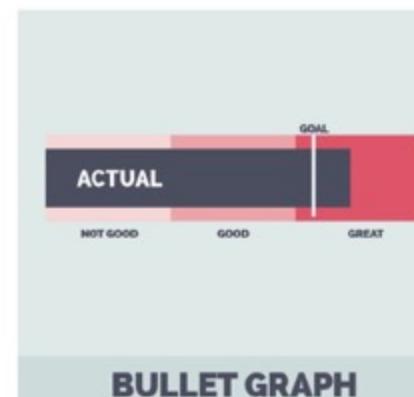
AM I MAKING **COMPARISONS?** | Options



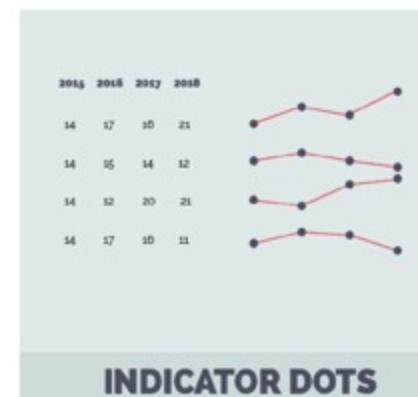
Comparing against a benchmark



Good for showing how different groups meet or don't meet a specified goal or benchmark.



Good for showing how well an organization or team is doing in comparison to goals, benchmarks, and what is or is not acceptable.



Good for visualizing tabular data to quickly show trends with several metrics.

PART III/V RAPID REVIEW



AM I MAKING **COMPARISONS?** | Examples

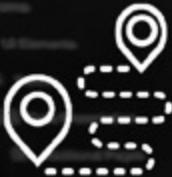


Comparing against a Benchmark



Source: geckoboard.com

PART III/V RAPID REVIEW



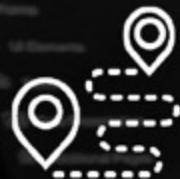
ONE IMPORTANT FACT
COMPARISONS
SURVEYS & QUESTIONNAIRES
PARTS OF A WHOLE
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WHEN GRAPHS AREN'T BEST

EXERCISE

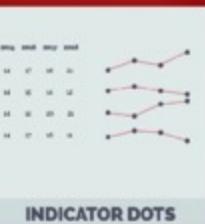
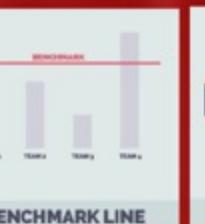
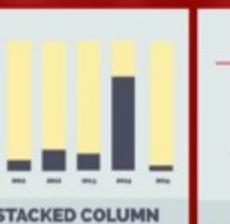
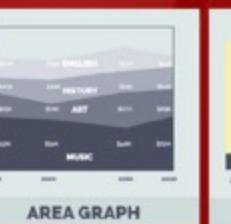
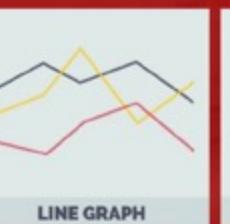
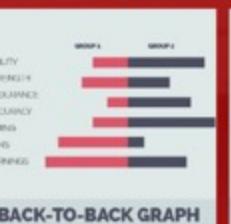
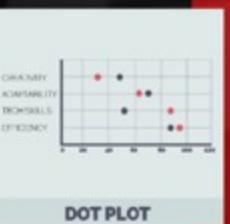
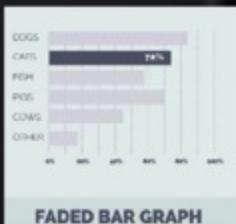
Scenario: Your company is making a big push to increase gender equality in leadership roles. You work for human resources and you are asked to give a presentation on gender disparity in leadership positions across several sectors in government, industry, and education. In researching data from the Pew Research Center, you notice something particularly interesting: there is a trend toward more women leaders in all sectors, though the percentage of women CEOs in Fortune 500 companies is significantly less than in other sectors.

Goal: You determine that, in order to make a strong point of emphasis that your industry has a long way to go, you want to showcase the disparity between Fortune 500 companies and other sectors over the past 60 years.

PART III/V RAPID REVIEW



ONE IMPORTANT FACT
COMPARISONS
SURVEYS & QUESTIONNAIRES
PARTS OF A WHOLE
ONE IMPACTS ANOTHER
WHEN GRAPHS AREN'T BEST



EXERCISE

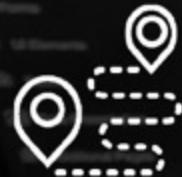
The Data: After sorting through several tables of data from Pew's website, you are able to assemble this table:

	1970	1980	1990	2000	2010	2020
U.S. Senate	1%	2%	2%	12%	17%	25%
Governors	2%	4%	6%	6%	12%	18%
Cabinet Positions	0%	17%	31%	19%	30%	26%
Fortune 500 CEOs	<1%	<1%	<1%	<1%	3%	5%
University Presidents	0%	10%	21%	24%	26%	32%

Data simplified for exercise purposes. Retrieved from <http://www.pewsocialtrends.org/fact-sheet/the-data-on-women-leaders/>

Which graph would you use to visualize the data in order to best emphasize the disparity in female leadership, particularly in Fortune 500 CEO positions?

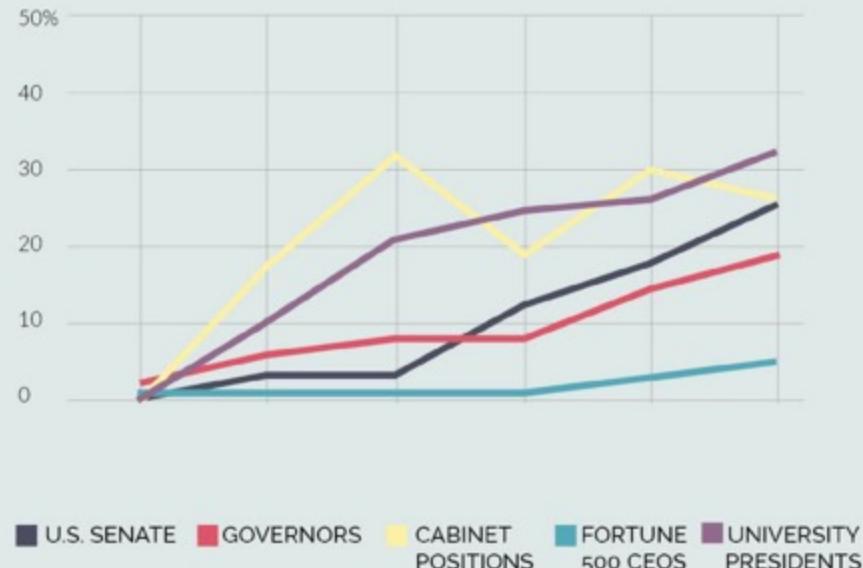
PART III/V RAPID REVIEW



ONE IMPORTANT FACT
COMPARISONS
SURVEYS & QUESTIONNAIRES
PARTS OF A WHOLE
ONE IMPACTS ANOTHER
WHEN GRAPHS AREN'T BEST

EXERCISE

Percentage of **WOMEN IN LEADERSHIP POSITIONS** In the united states – 1970 to 2020



LINE GRAPH

LINE GRAPH

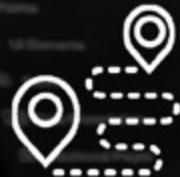
Benefits

- Easy to create.
- Shows both dates and sectors across time.
- Clearly shows Fortune 500 CEOs as behind other sectors.

Drawbacks:

- Cannot compare both men and women AND multiple sectors.
- Overlapping lines can be difficult to read; if sectors are very similar over long periods of time, it can be difficult to distinguish between them.

PART III/V RAPID REVIEW

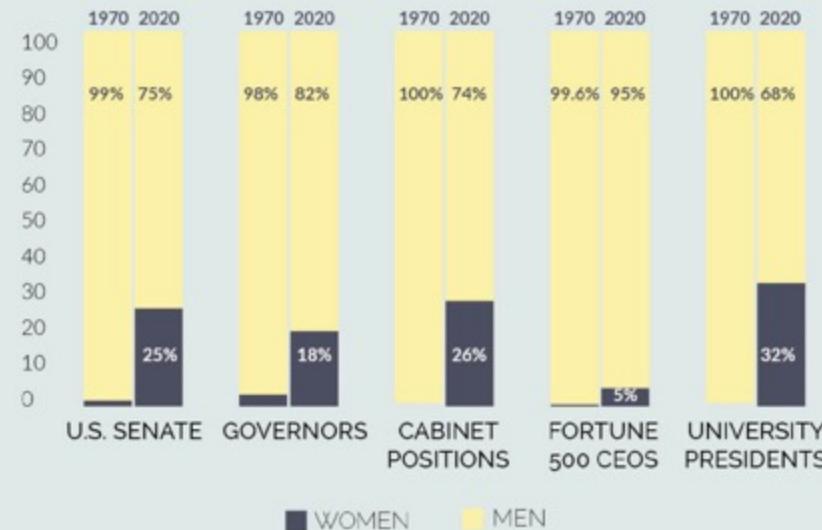


ONE IMPORTANT FACT
COMPARISONS
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PARTS OF A WHOLE
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WHEN GRAPHS AREN'T BEST

EXERCISE

Percentage of **WOMEN IN LEADERSHIP POSITIONS**

In the united states – 1970 to 2020



STACKED BAR

STACKED BAR

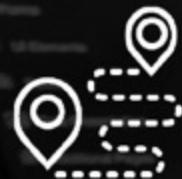
Benefits

- Easy to create.
- Can show numbers of both men and women

Drawbacks:

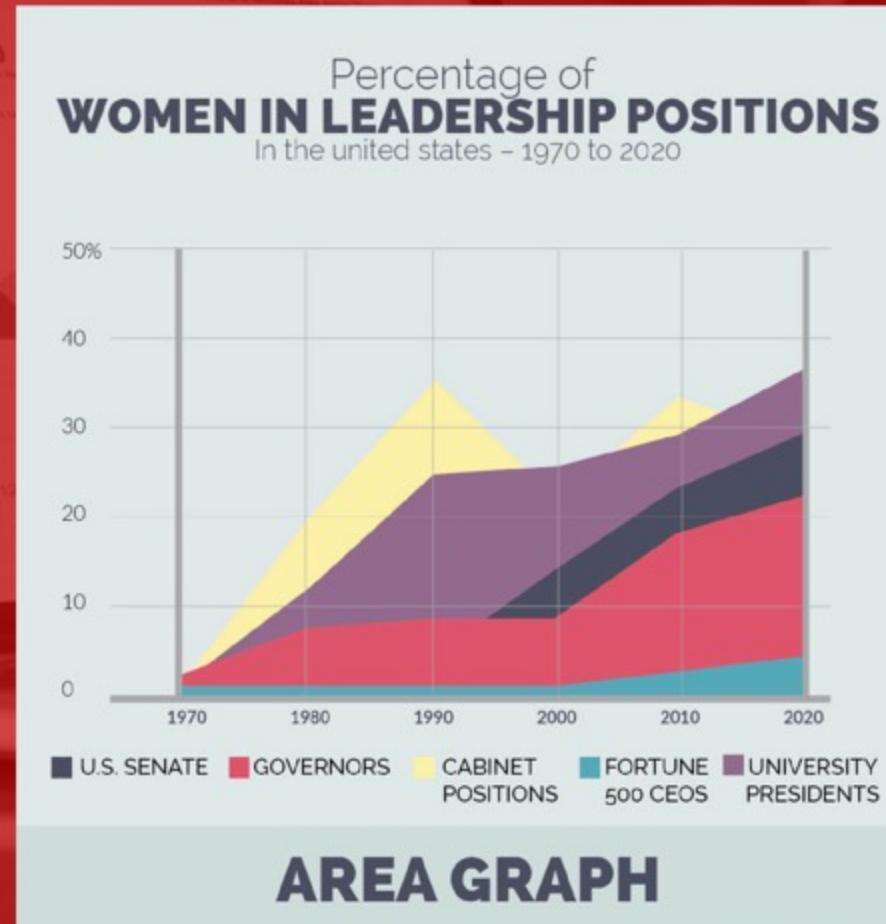
- Only able to compare two dates if you want to show multiple sectors.
- The emphasis isn't as dramatic here because the data for each sector is spread out.

PART III/V RAPID REVIEW



ONE IMPORTANT FACT
COMPARISONS
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WHEN GRAPHS AREN'T BEST

EXERCISE



AREA GRAPH

Benefits

- Easier to make dramatic emphasis.
- Can show multiple sectors over time.

Drawbacks:

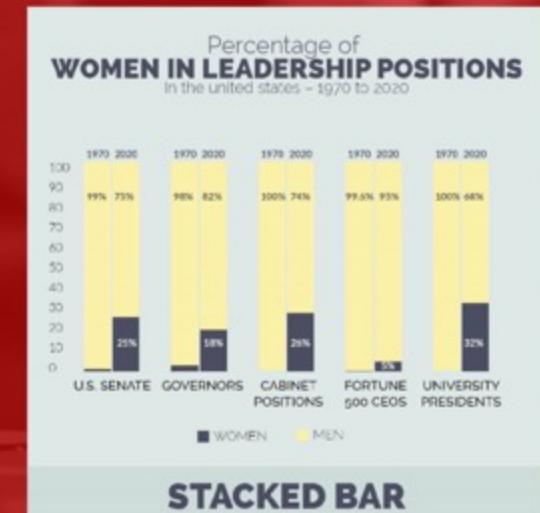
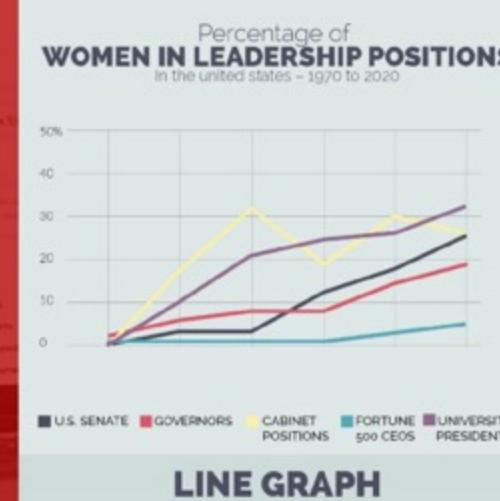
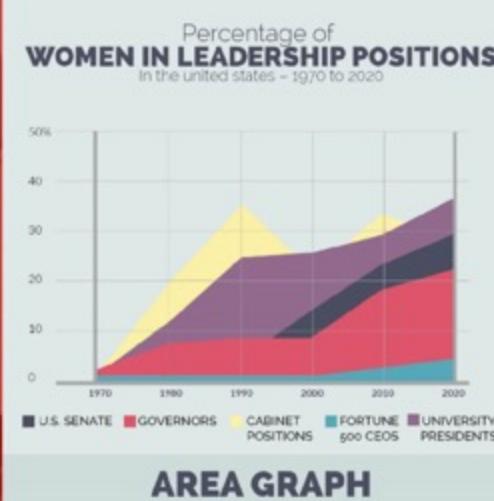
- More difficult to create.
- Cannot compare both men and women AND multiple sectors.
- Overlapped data becomes hidden.

PART III/V RAPID REVIEW



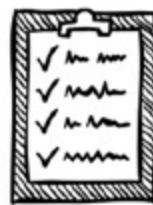
ONE IMPORTANT FACT
COMPARISONS
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EXERCISE

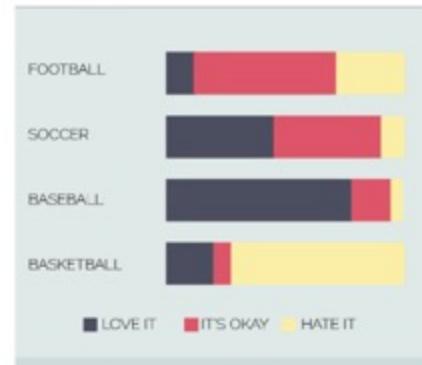


Which is best?

PART III/V RAPID REVIEW

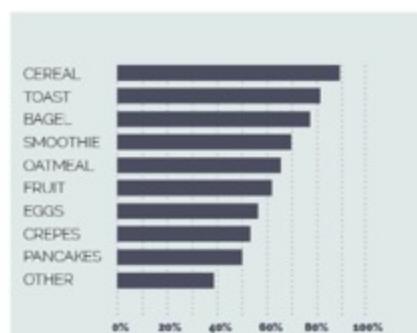


AM I SHOWING THE RESULTS OF **SURVEYS & QUESTIONNAIRES?** | Options



STACKED BAR

Good for evaluating how responses vary within a single variable. Good for Likert scale questions.



COLUMN GRAPH

Similar to a bar graph, but good for showing a progression or regression. Good for "select-all-that-apply" questions.



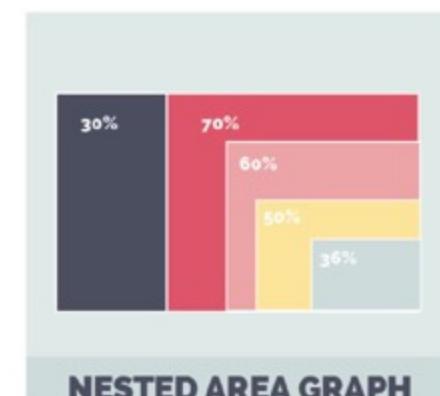
NUMBERS W/ ICONS

Good for quick visual representations of data that can be singled out.



SMALL MULTIPLES

Good for comparing responses to the same question against multiple variables. Good for Likert scale questions.



NESTED AREA GRAPH

Good for showing how parts of one piece of data break down into smaller pieces of data. Especially useful for branching questions.

PART III/V RAPID REVIEW



AM I SHOWING THE RESULTS OF **SURVEYS & QUESTIONNAIRES?** | Examples

Branching questions or parts of parts

25% said no
(125 out of 500)

75% said yes (375 out of 500)

81% said daily (304 out of 375)

64% use software (195 out of 304)

16%
prefer
Tableau
(31 out
of 195)

57%
prefer
Excel
(111 out
of 195)

Source: stephanieevergreen.com

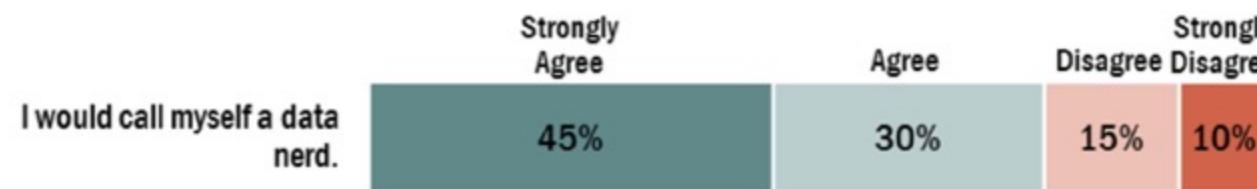
PART III/V RAPID REVIEW



AM I SHOWING THE RESULTS OF SURVEYS & QUESTIONNAIRES? | Examples

Multiple responses with a single variable.

While feeling confident in data wrangling, more participants shied away from calling themselves nerds.



Source: evergreendata.com

PART III/V RAPID REVIEW



AM I SHOWING THE **PARTS OF A WHOLE?** | Options



PIE CHART

Best for showing percentages of a whole (must add to 100%). Usually best if only comparing 4 or 5 data points.



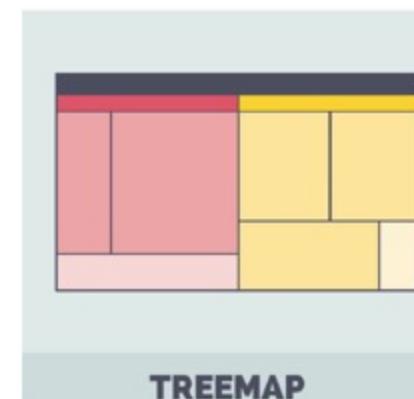
100% STACKED BAR

Good for showing parts of a whole (must add to 100%), but easier to compare percentages than a pie chart by stacking multiple bars.



HISTOGRAM

Like a bar chart, but more effective at showing data with ranges and intervals (like age).



TREEMAP

Good for showing group structures and organizational strategies.



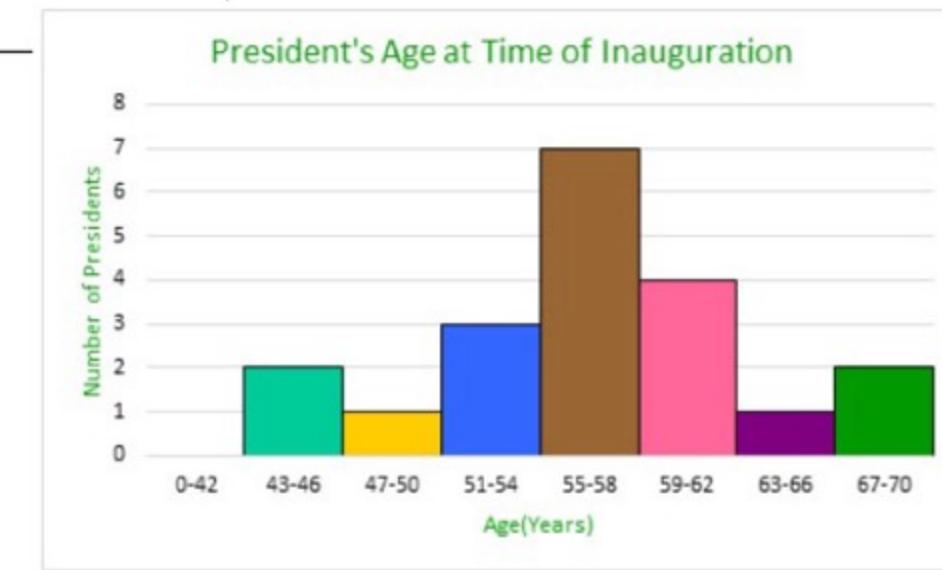
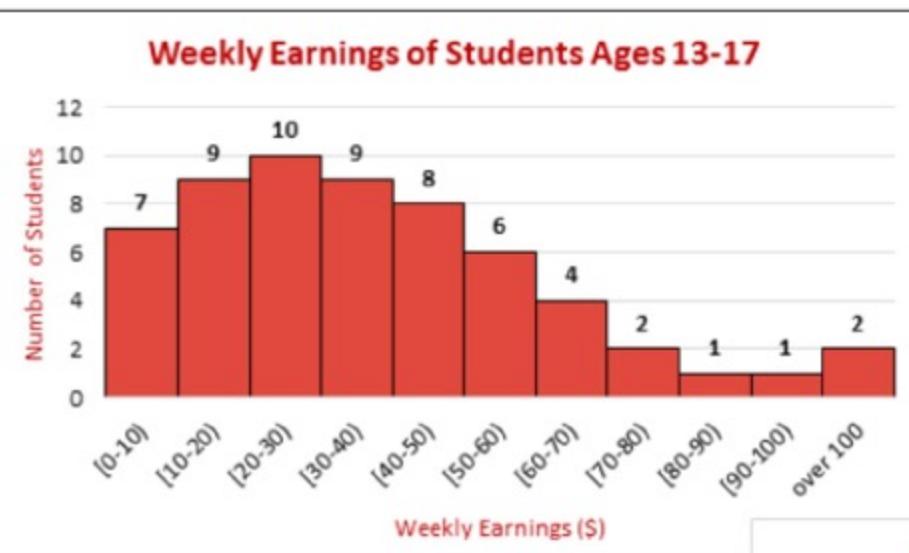
GEOMAP

Good for comparing locations against a data point within a single, larger region.

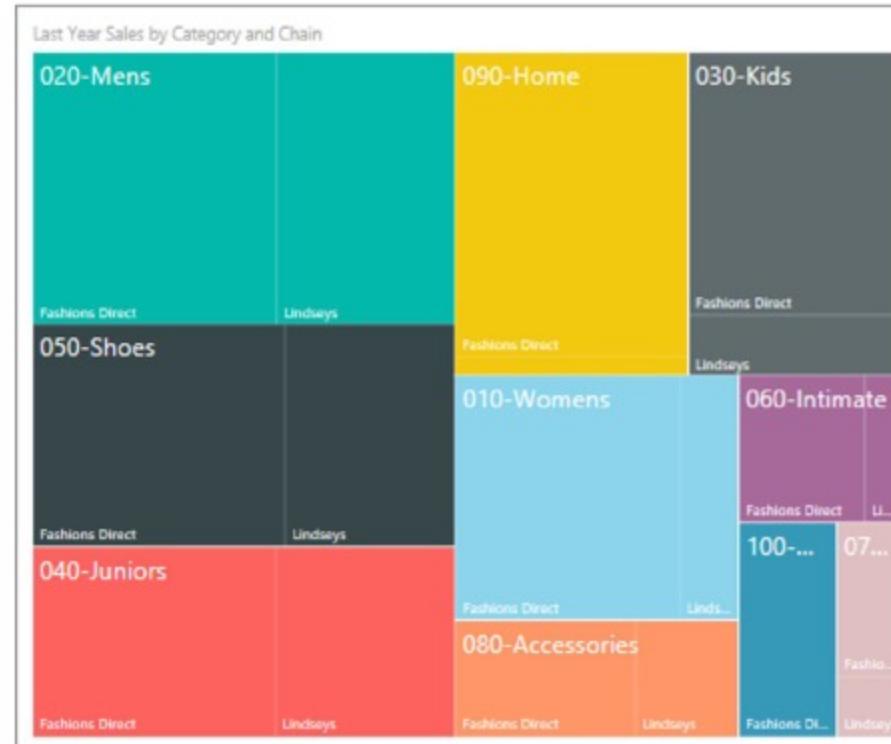
PART III/V RAPID REVIEW



AM I SHOWING THE **PARTS OF A WHOLE** | Examples



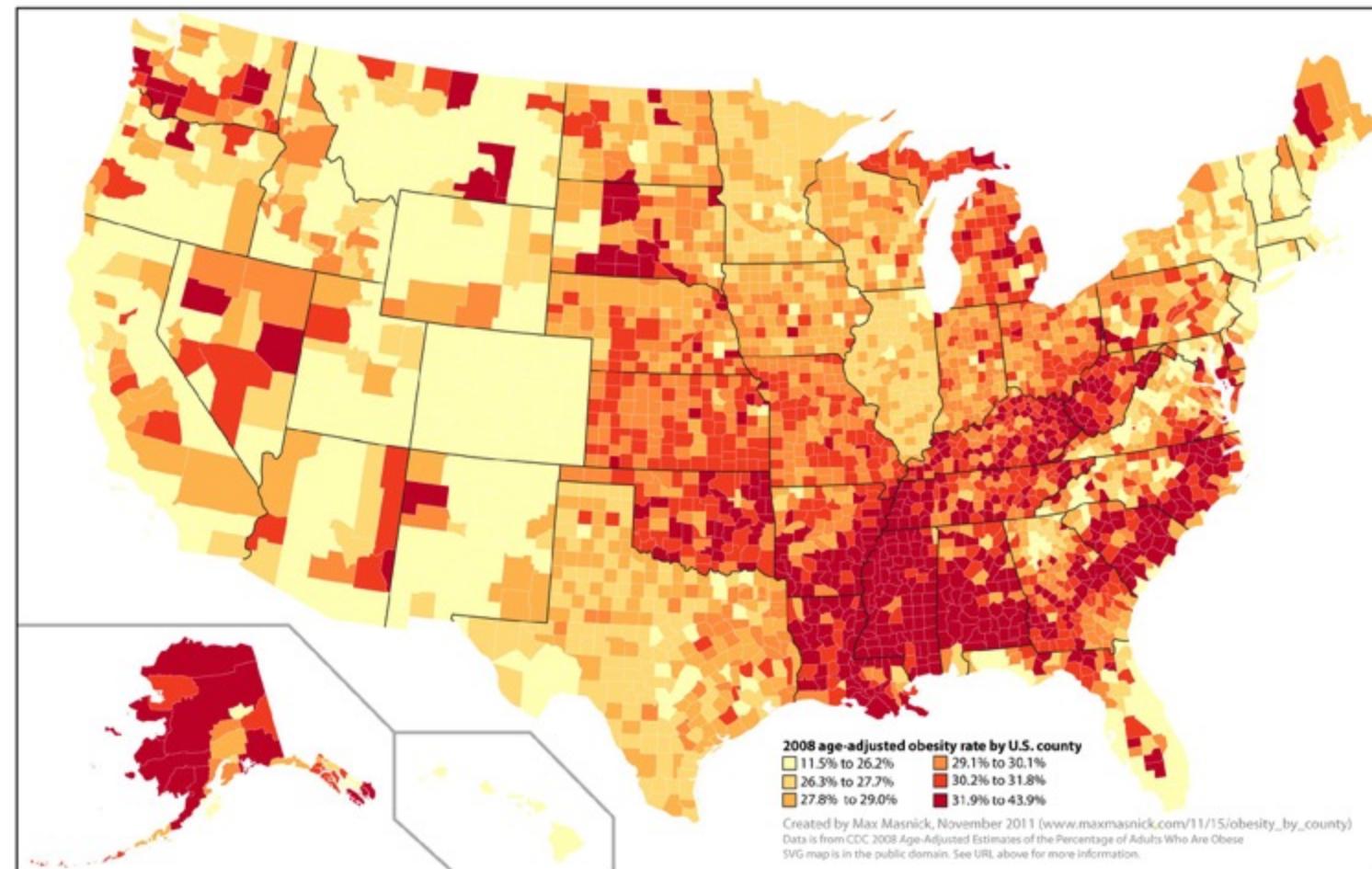
PART III/V RAPID REVIEW



PART III/V RAPID REVIEW



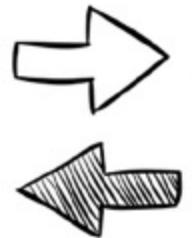
AM I SHOWING THE **PARTS OF A WHOLE | Options**



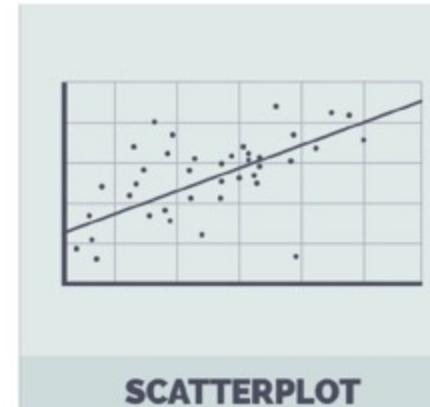
Source: maxmasnick.com

PART III/V RAPID REVIEW

ONE IMPORTANT FACT
COMPARISONS
SURVEYS & QUESTIONNAIRES
PARTS OF A WHOLE
ONE IMPACTS ANOTHER
WHEN GRAPHS AREN'T BEST

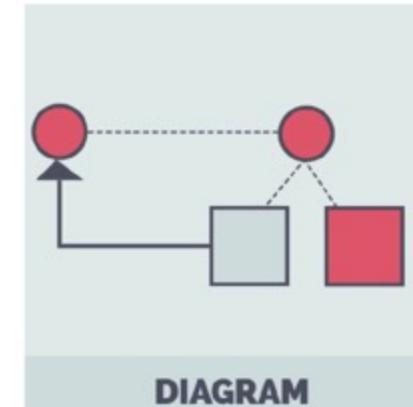


AM I SHOWING HOW ONE DATA SET **IMPACTS ANOTHER?** | Options



SCATTERPLOT

Good for showing how two variables correlate and change for a single subject (like the correlation between height and weight of children where each dot represents a child).



DIAGRAM

Good for showing processes, especially when multiple options or decisions are possible. Good for showing causal relationships.



DETAILED DESCRIPTION

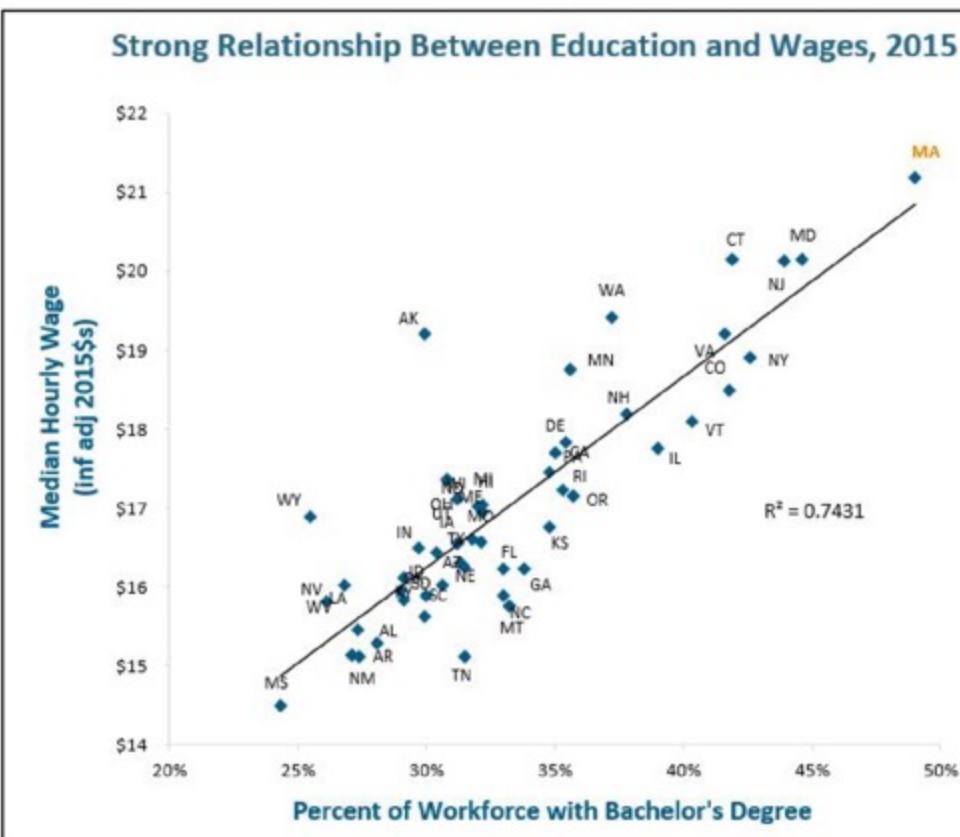
Sometimes the necessary option to describe complex scenarios. Use when no visual diagram is possible, but consider organizing text to still have visual components like numbered lists, bullets, boldface, and italics.

PART III/V RAPID REVIEW

ONE IMPORTANT FACT
COMPARISONS
SURVEYS & QUESTIONNAIRES
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WHEN GRAPHS AREN'T BEST



AM I SHOWING HOW ONE DATA SET **IMPACTS ANOTHER?** | Options



Source: massbudget.org

PART III/V RAPID REVIEW



WHEN GRAPHS AREN'T BEST | Options

Anger
Fear
Disgust
Happiness
Sadness
Surprise
Contempt

WORDS

Good when the word itself matters or when no visual seems to clearly communicate meaning as well as a term.



PICTURES

Best for instructions or when showing the parts of a complex object or area.

DISORDER
THIRST
AWARNESS
NERVOUS
DEPRESSION
TEMPER
FEAR
DESPAIR
WORRY
FRUSTRATION
WITHDRAWAL
OVERWHELMED
PANIC
HEADACHE
SCARED
AGITATION
IRRITABILITY
NEGATIVE MOOD
LONELINESS
NEGATIVE

WORDCLOUDS

Good for showing frequency of word use across a single or across many communication media.



HEAT MAP

Good for showing moods and emotions of people based on qualitative responses.

PART III/V **RAPID REVIEW**



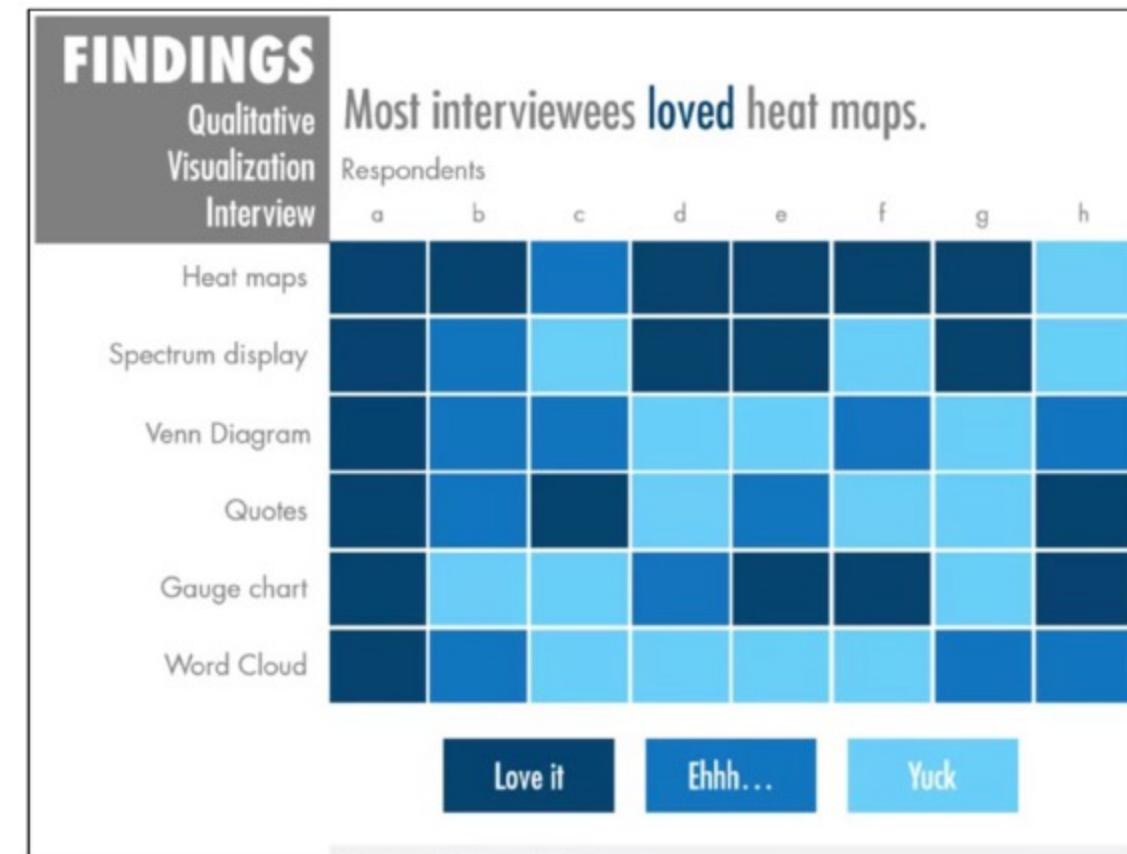
WHEN GRAPHS AREN'T BEST | Options

Source: fiveablog.wordpress.com

PART III/V RAPID REVIEW



WHEN GRAPHS AREN'T BEST | Options



Source: stephanieevergreen.com

PART IV

DATA VISUALIZATION IN PRACTICE

Some Dos and Don'ts

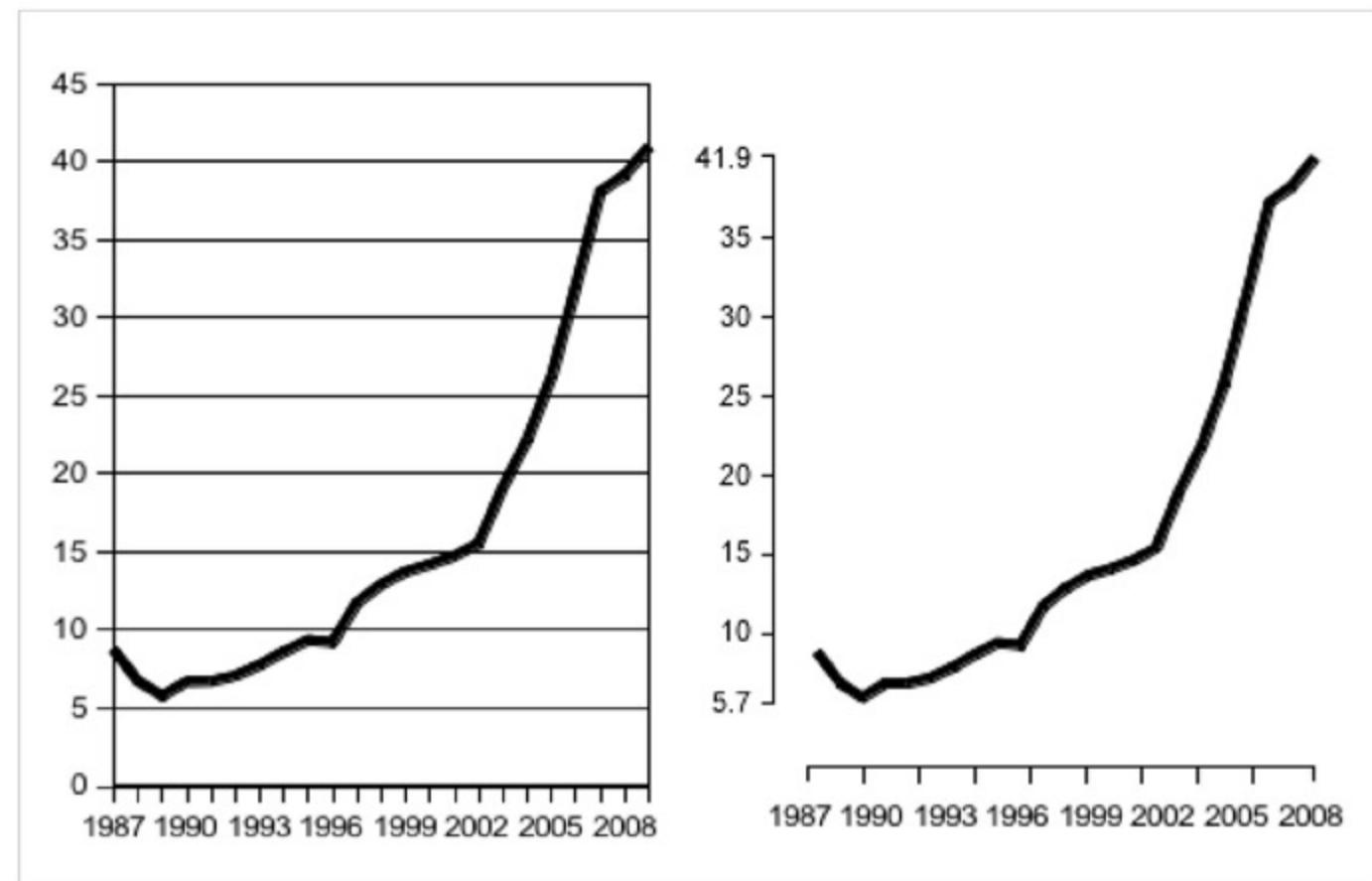


- >> DATA VISUALIZATION DOS
- >> DATA VISUALIZATION DON'TS
- >> DESIGN TIPS
- >> USING CHARTS AND GRAPHS IN REPORTS

PART IV/V DV IN PRACTICE

DATA VISUALIZATION DOS
DATA VISUALIZATION DON'TS
DESIGN TIPS: SIMPLIFY
USING CHARTS AND GRAPHS
IN REPORTS

DO: Keep Graphs Simple

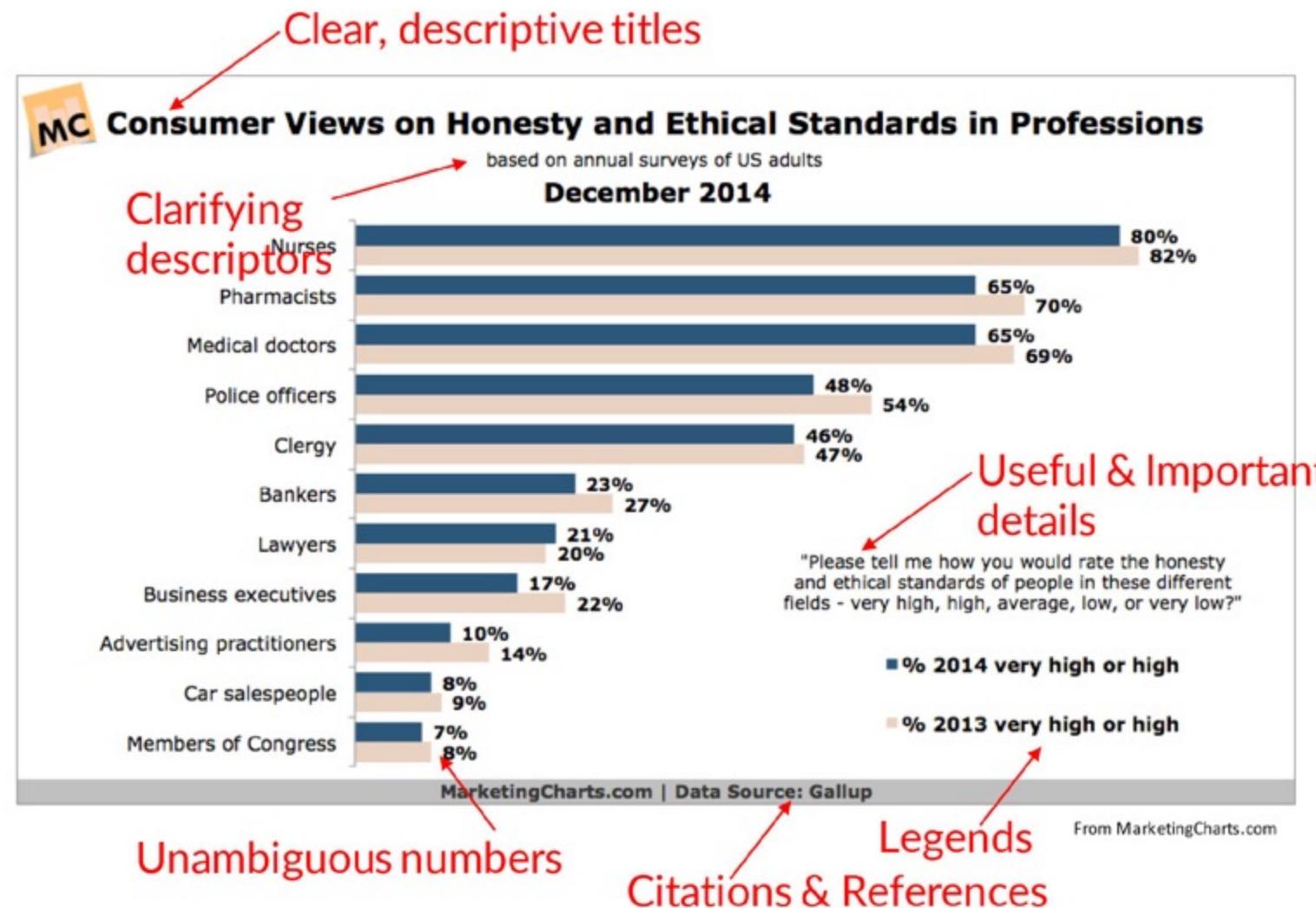


From <https://www.vis4.net/blog/2012/06/doing-the-line-charts-right/>

PART IV/V DV IN PRACTICE

DATA VISUALIZATION DOS
DATA VISUALIZATION DON'TS
DESIGN TIPS: SIMPLIFY
USING CHARTS AND GRAPHS
IN REPORTS

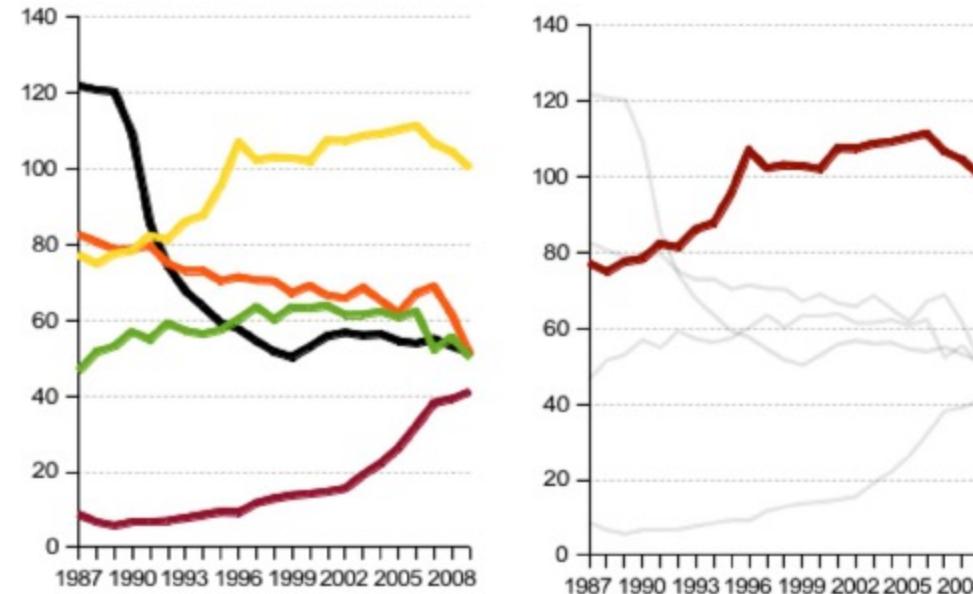
DO: Make Graphs Stand Alone



PART IV/V DV IN PRACTICE

DATA VISUALIZATION DOS
DATA VISUALIZATION DON'TS
DESIGN TIPS: SIMPLIFY
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DO: Emphasize What's Important

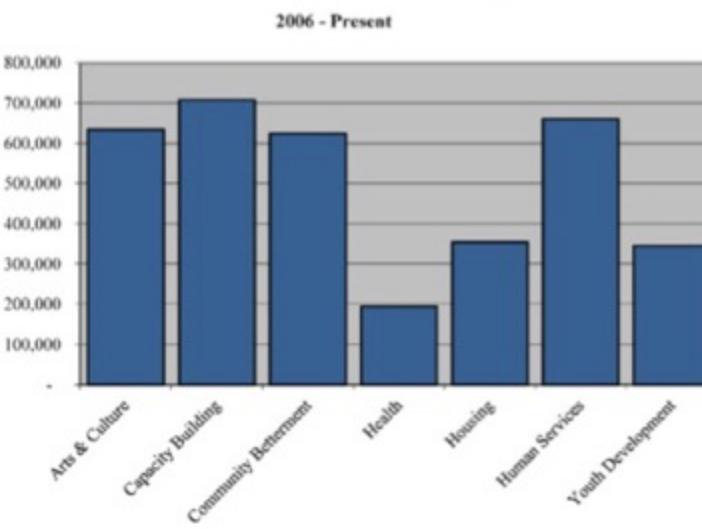


PART IV/V DV IN PRACTICE

DATA VISUALIZATION DOS
DATA VISUALIZATION DON'TS
DESIGN TIPS: SIMPLIFY
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IN REPORTS

DO: Be Strategic about Message

Investment by area of impact

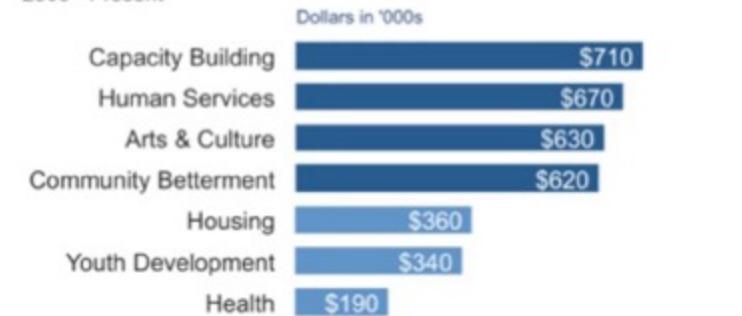


From: StorytellingWithData.com | <http://www.storytellingwithdata.com/blog/2012/10/my-penchant-for-horizontal-bar-graphs>

We invest primarily in four areas

Since we began investing in 2006, **four areas have received more than \$600K each, accounting for 75% of total grantmaking activity**

Investment by Area of Impact 2006 - Present



According to DV Expert Cole Nussbaumer Knaflic:

- Replace descriptive title with active
- Add insights with text
- Flip chart on its side
- Order data (greatest to least)
- Label unclear axes
- Narrow bars
- Remove visual noise (outlines and lines)
- Color strategically

PART IV/V DV IN PRACTICE

DATA VISUALIZATION DOS
DATA VISUALIZATION DON'TS
DESIGN TIPS: SIMPLIFY
USING CHARTS AND GRAPHS
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DO: Get a Second Opinion

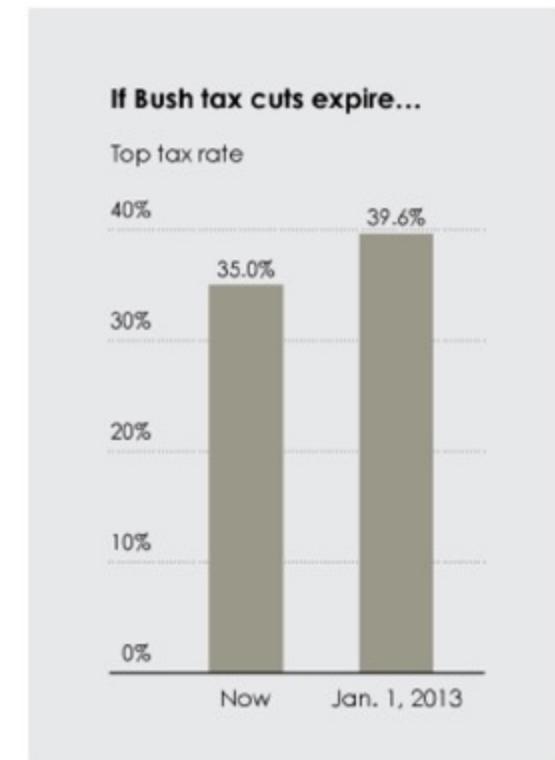
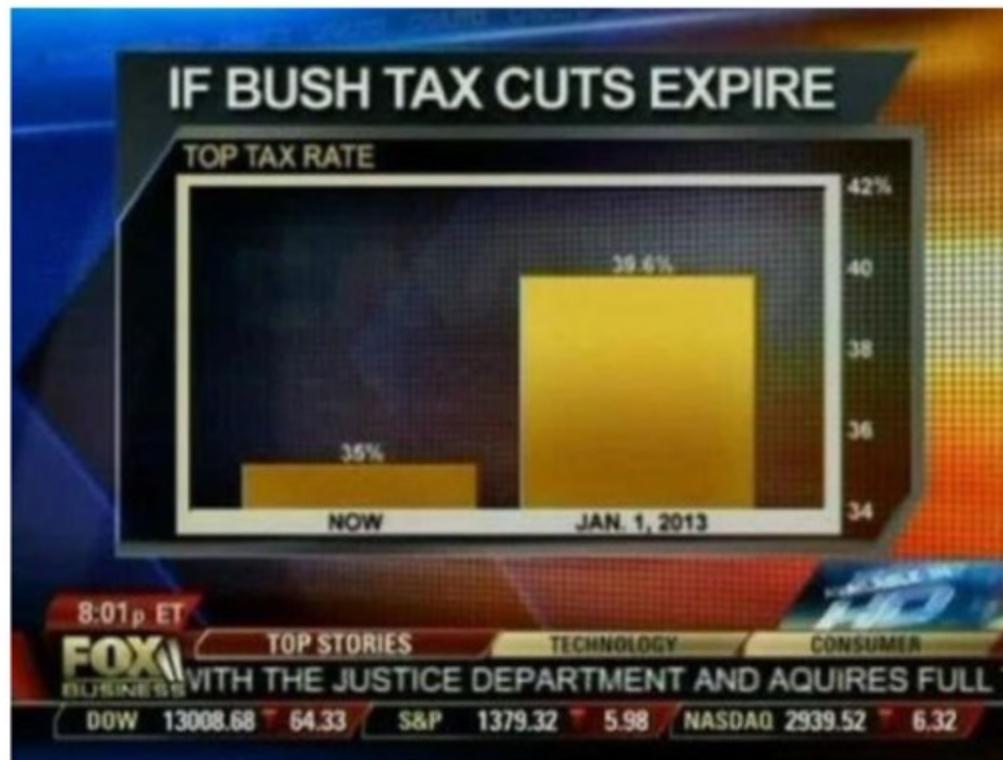


- ✓ Show colleagues, experts, and non-experts
- ✓ Consider doing a usability test
- You might be surprised what is confusing!

PART IV/V DV IN PRACTICE

DATA VISUALIZATION DOS
DATA VISUALIZATION DON'TS
DESIGN TIPS: SIMPLIFY
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DON'T: Start Baseline above Zero

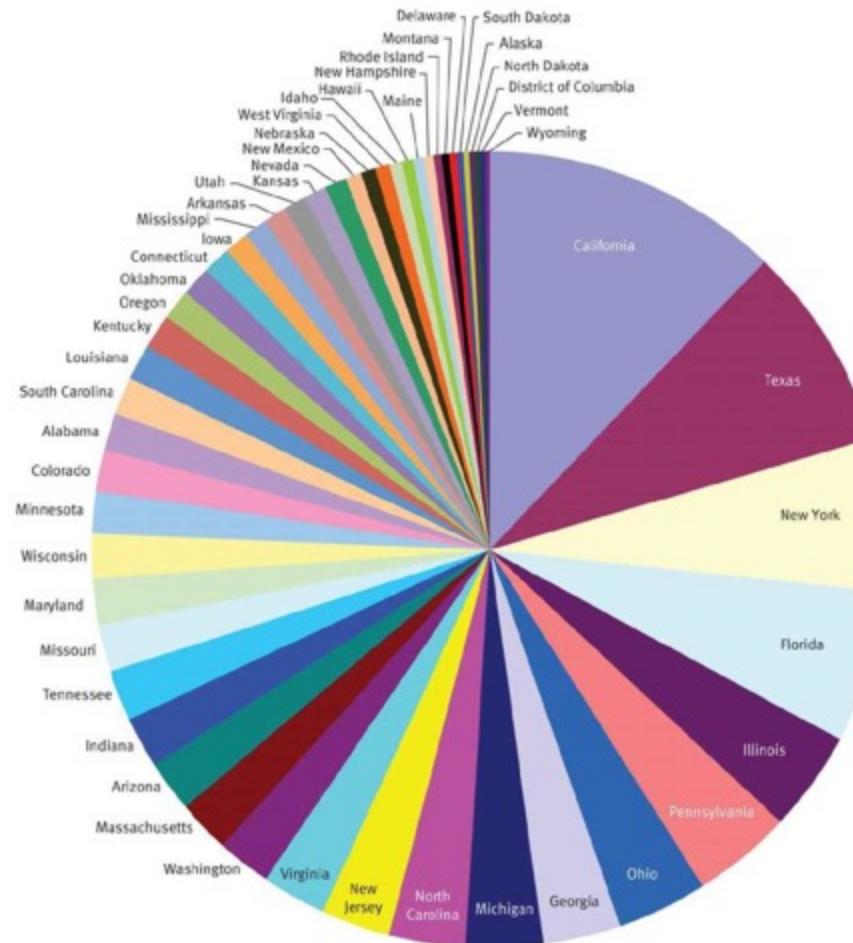


From: FlowingData.com | <https://flowingdata.com/2012/08/06/fox-news-continues-charting-excellence/>

PART IV/V DV IN PRACTICE



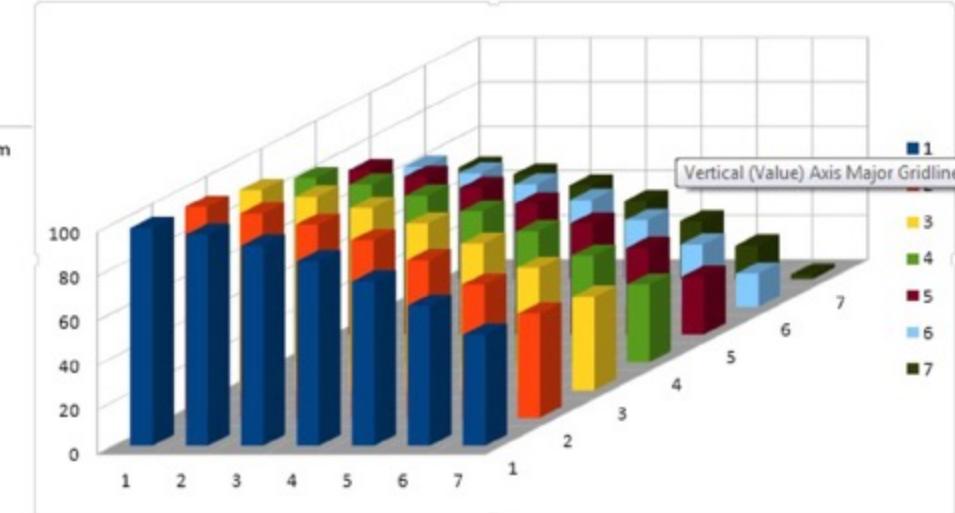
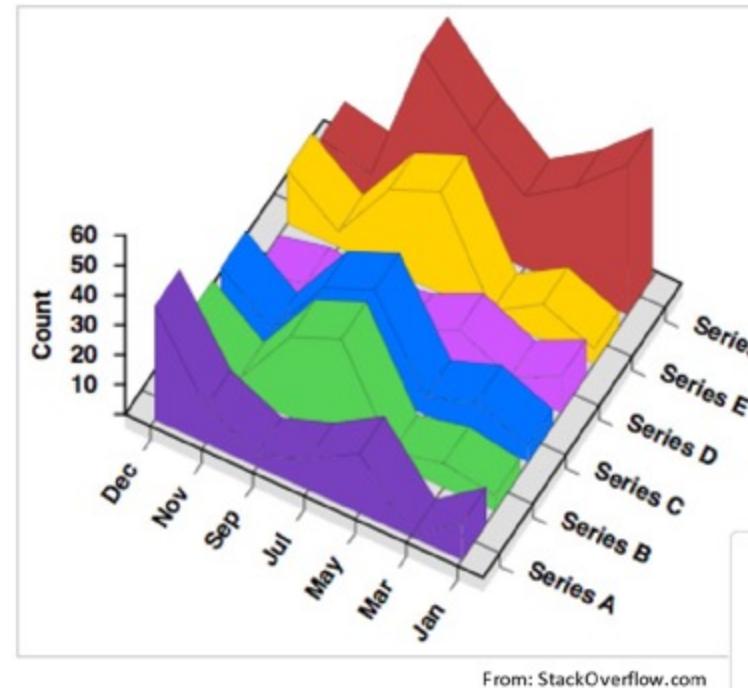
DON'T: Overload with Data



PART IV/V DV IN PRACTICE

DATA VISUALIZATION DOS
DATA VISUALIZATION DON'TS
DESIGN TIPS: SIMPLIFY
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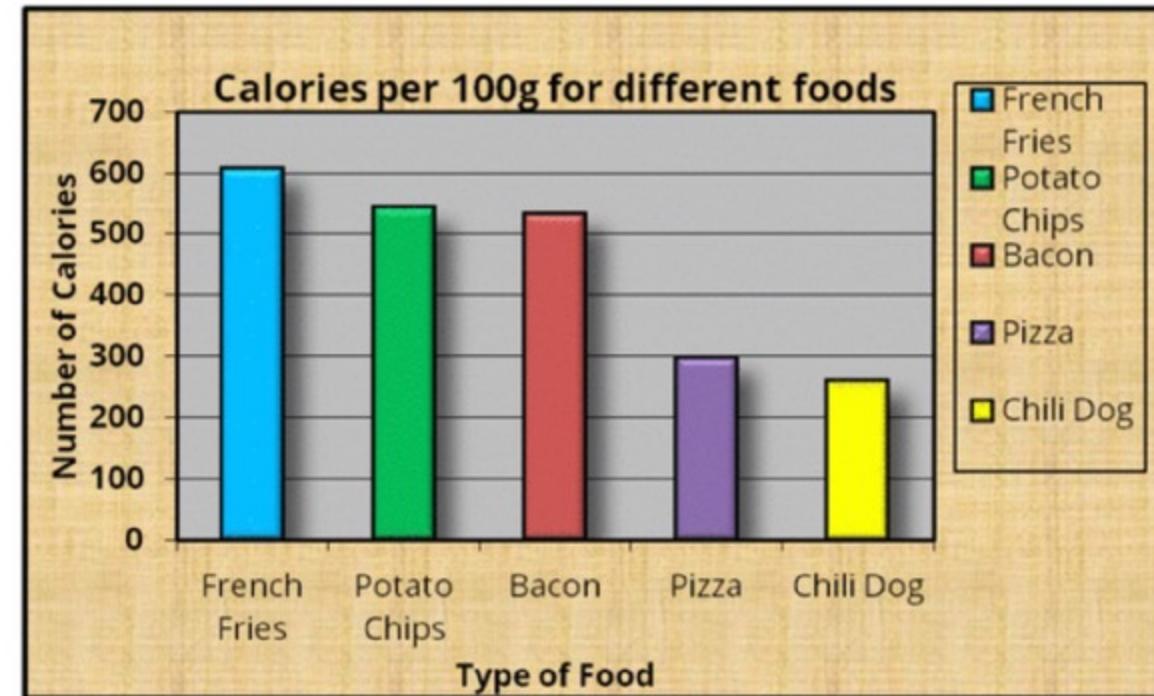
DON'T: Use 3D Effects



PART IV/V DV IN PRACTICE

DATA VISUALIZATION DOS
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DESIGN TIPS | Simplify

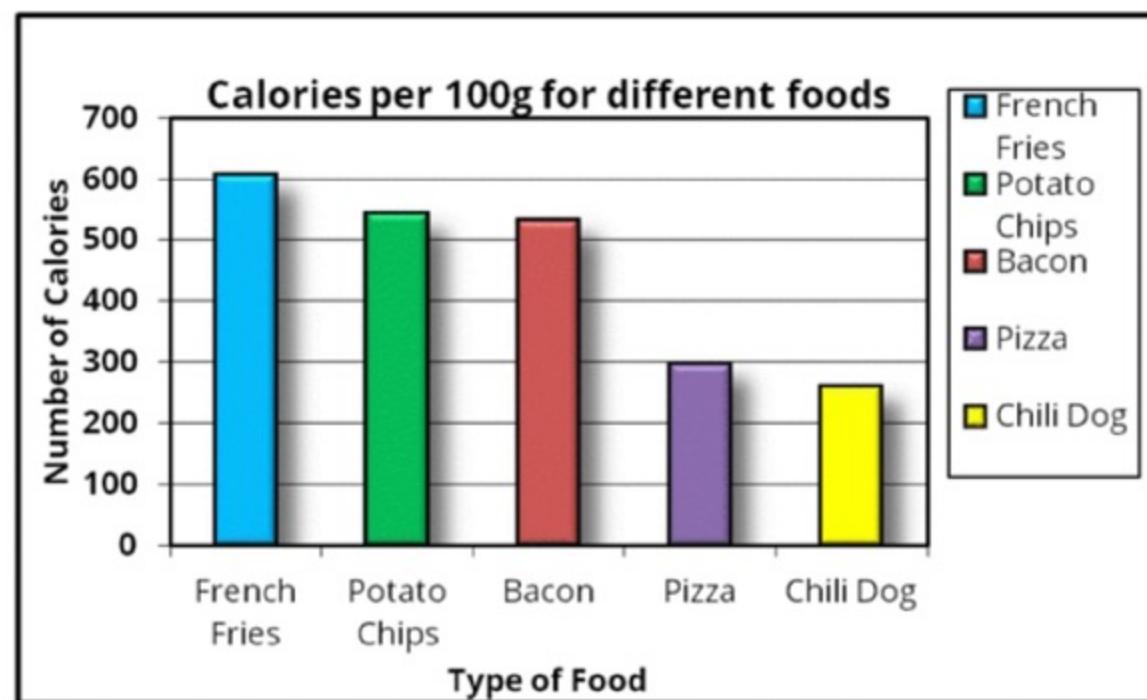
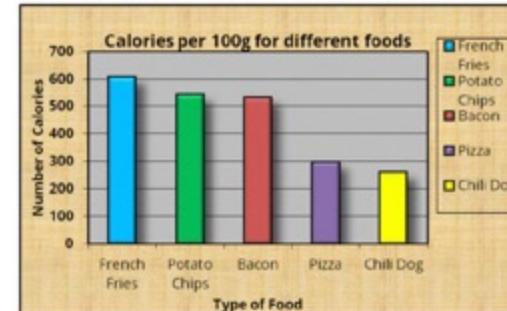


<https://www.darkhorseanalytics.com/portfolio/data-looks-better-naked-bar-charts>

PART IV/V DV IN PRACTICE



STEP 1 | Remove Background(s)

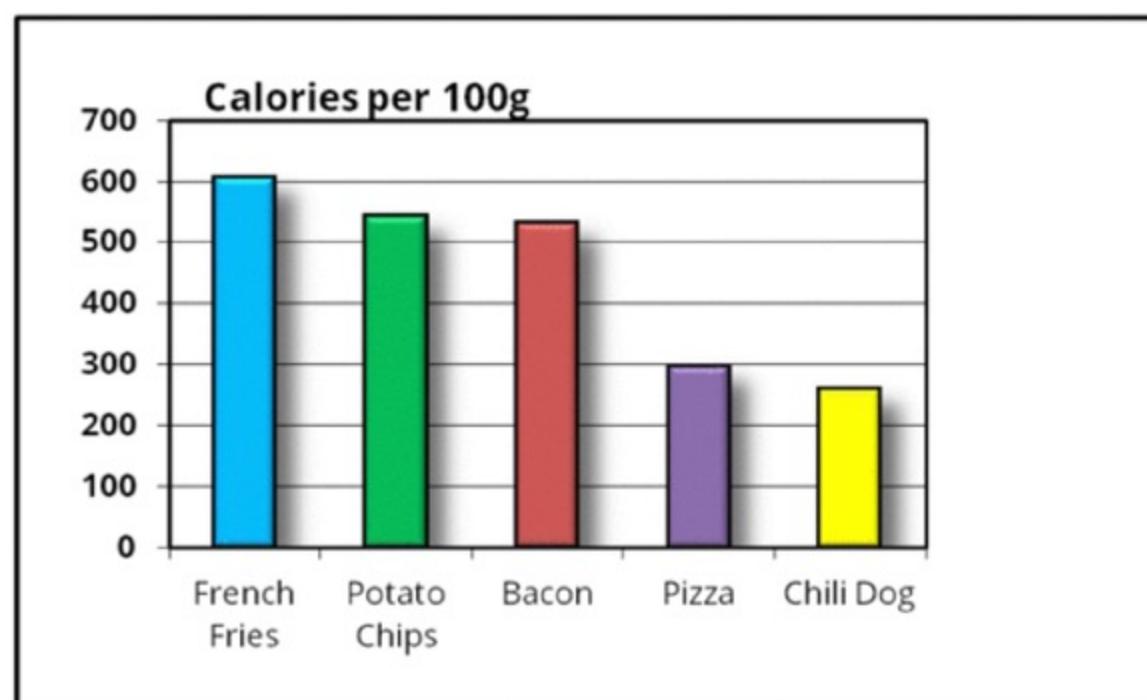
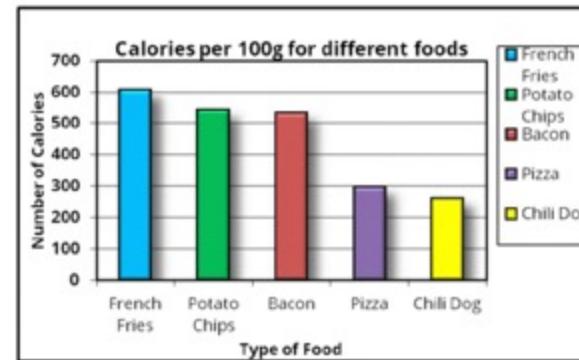


<https://www.darkhorseanalytics.com/portfolio/data-looks-better-naked-bar-charts>

PART IV/V DV IN PRACTICE

DATA VISUALIZATION DOS
DATA VISUALIZATION DON'TS
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STEP 2 | Remove Redundant Labels

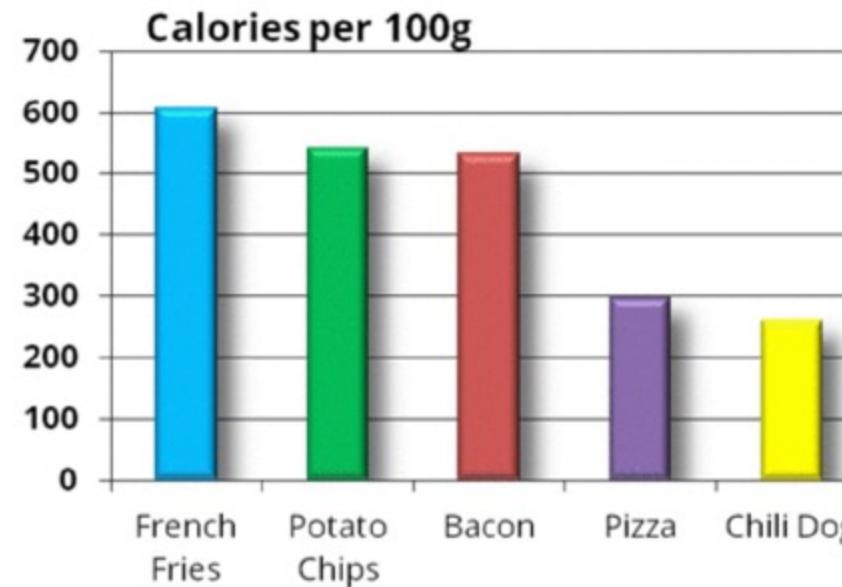
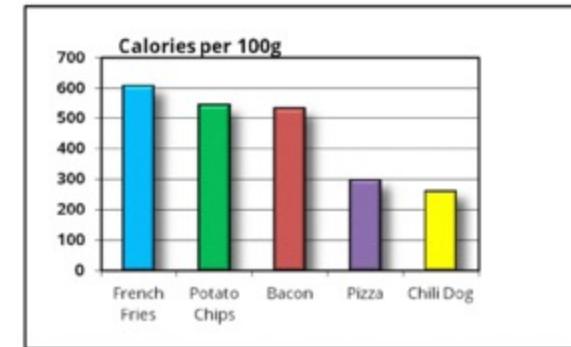


<https://www.darkhorseanalytics.com/portfolio/data-looks-better-naked-bar-charts>

PART IV/V DV IN PRACTICE

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STEP 3 | Remove Borders

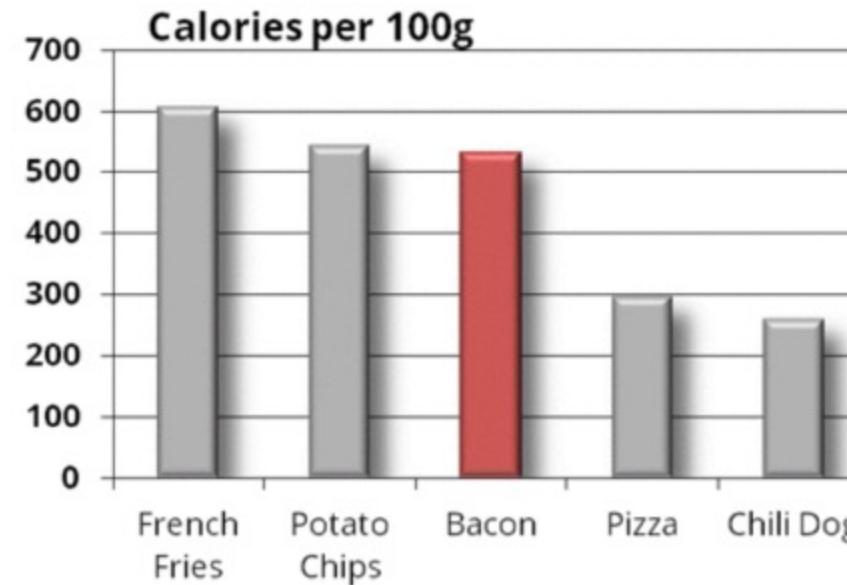
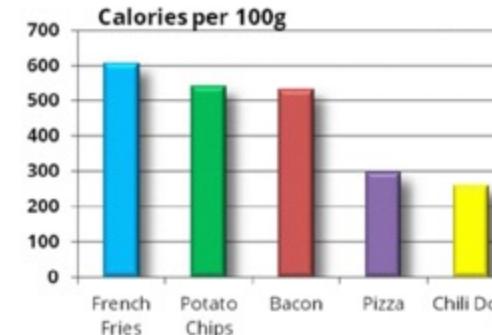


<https://www.darkhorseanalytics.com/portfolio/data-looks-better-naked-bar-charts>

PART IV/V DV IN PRACTICE

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STEP 4 | Reduce Colors

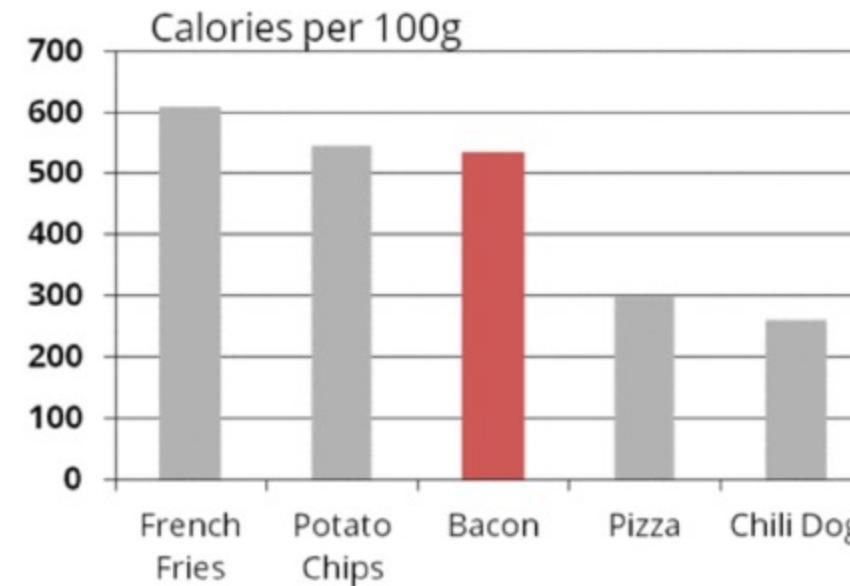
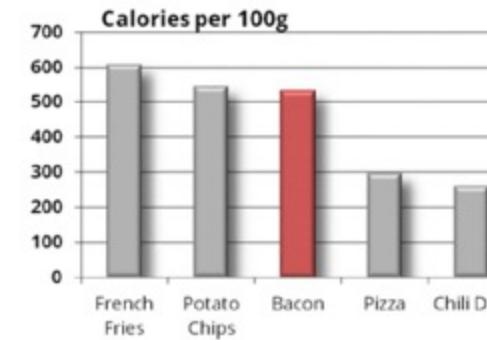


<https://www.darkhorseanalytics.com/portfolio/data-looks-better-naked-bar-charts>

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USING CHARTS AND GRAPHS
IN REPORTS

STEP 6 | Remove Special Effects

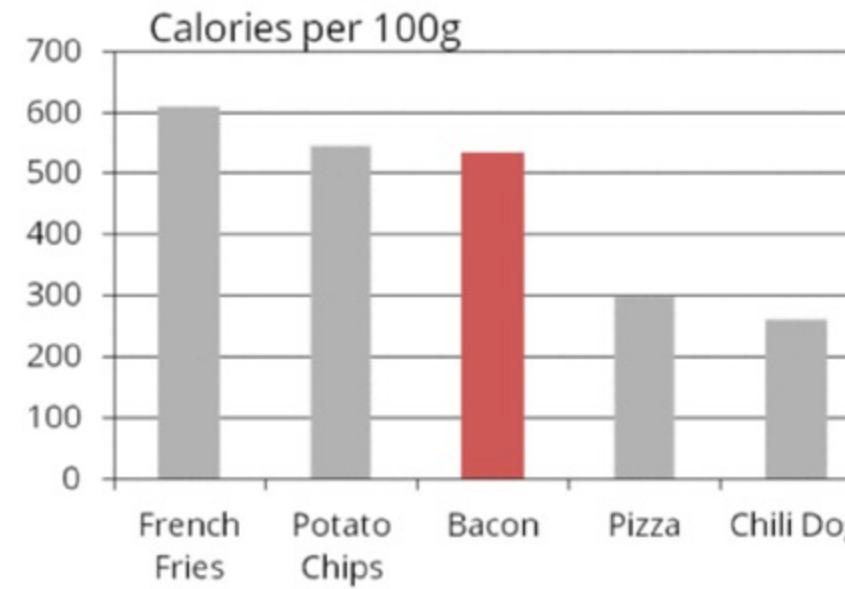
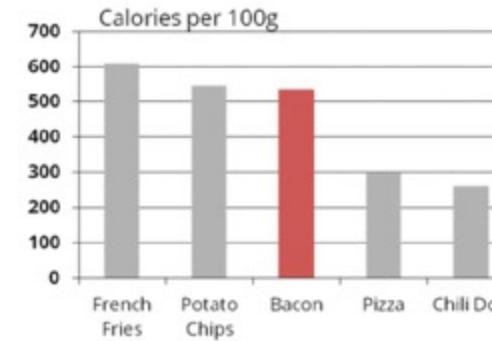


<https://www.darkhorseanalytics.com/portfolio/data-looks-better-naked-bar-charts>

PART IV/V DV IN PRACTICE

DATA VISUALIZATION DOS
DATA VISUALIZATION DON'TS
DESIGN TIPS: SIMPLIFY
USING CHARTS AND GRAPHS
IN REPORTS

STEP 7 | Remove Bold

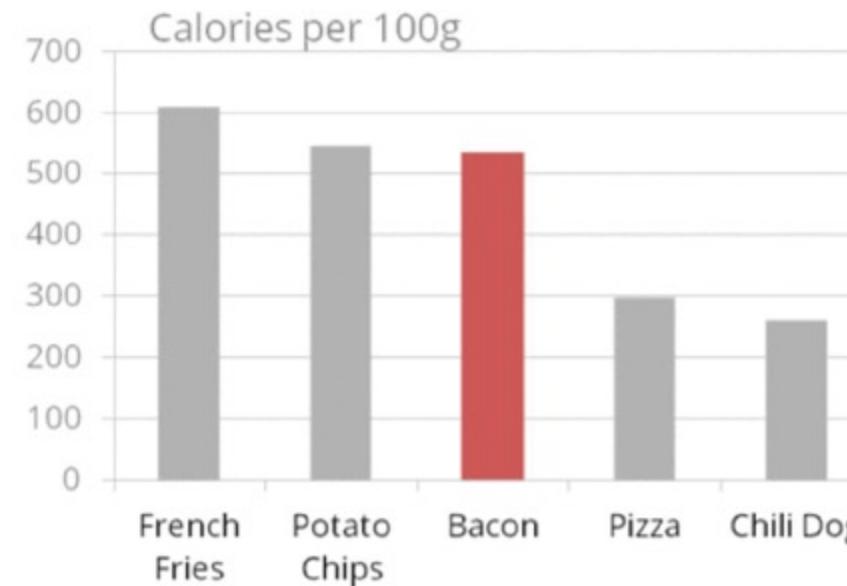
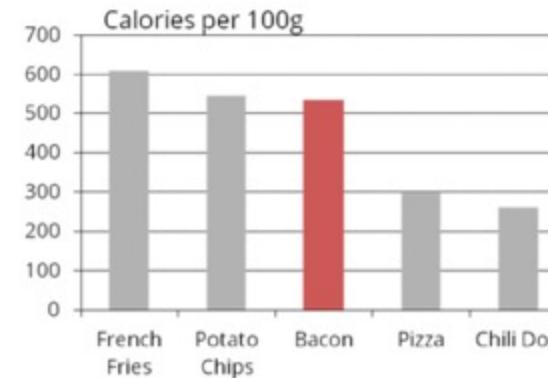


<https://www.darkhorseanalytics.com/portfolio/data-looks-better-naked-bar-charts>

PART IV/V DV IN PRACTICE



STEP 8 | Lighten Labels and Lines

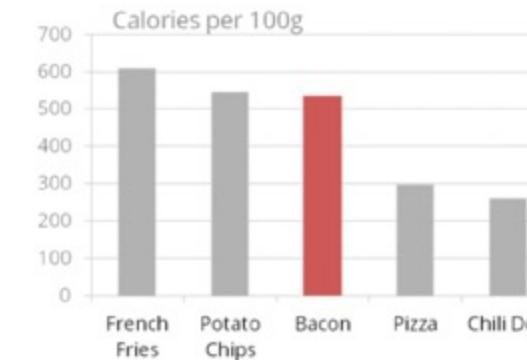


<https://www.darkhorseanalytics.com/portfolio/data-looks-better-naked-bar-charts>

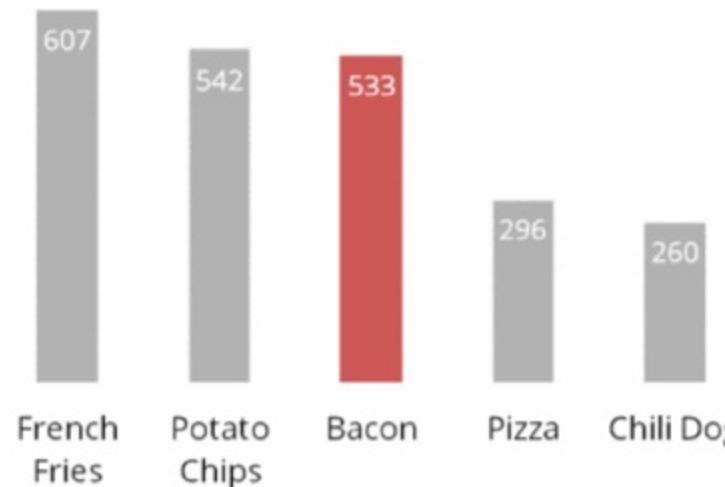
PART IV/V DV IN PRACTICE



STEP 9 | Use Direct Labels



Calories per 100g

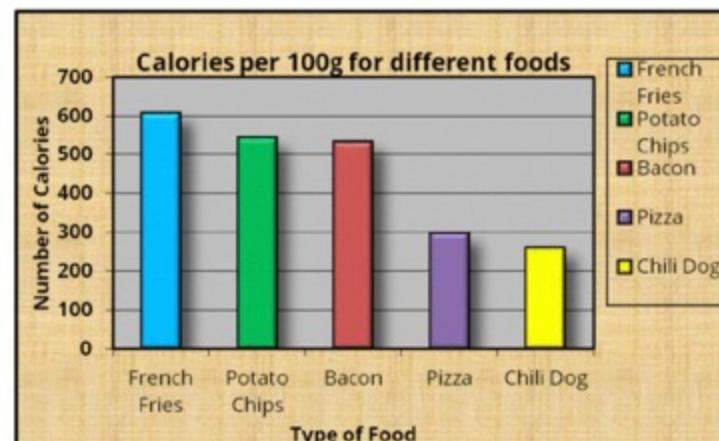


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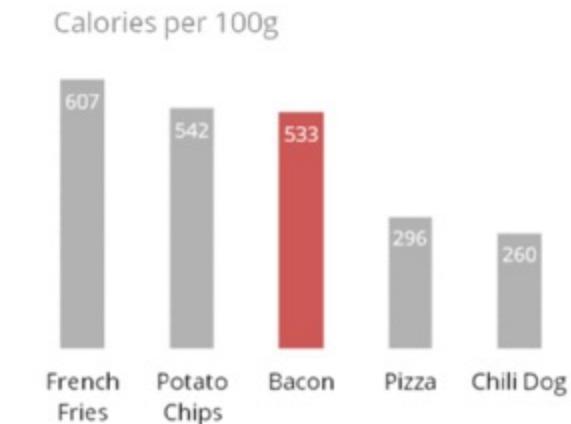
PART IV/V DV IN PRACTICE

DATA VISUALIZATION DOS
DATA VISUALIZATION DON'TS
DESIGN TIPS: SIMPLIFY
USING CHARTS AND GRAPHS
IN REPORTS

DESIGN TIPS | Simplify



<https://www.darkhorseanalytics.com/portfolio/data-looks-better-naked-bar-charts>



PART IV/V DV IN PRACTICE



USING CHARTS & GRAPHS IN REPORTS

RULE #1: Include a List of Figures in Table of Contents

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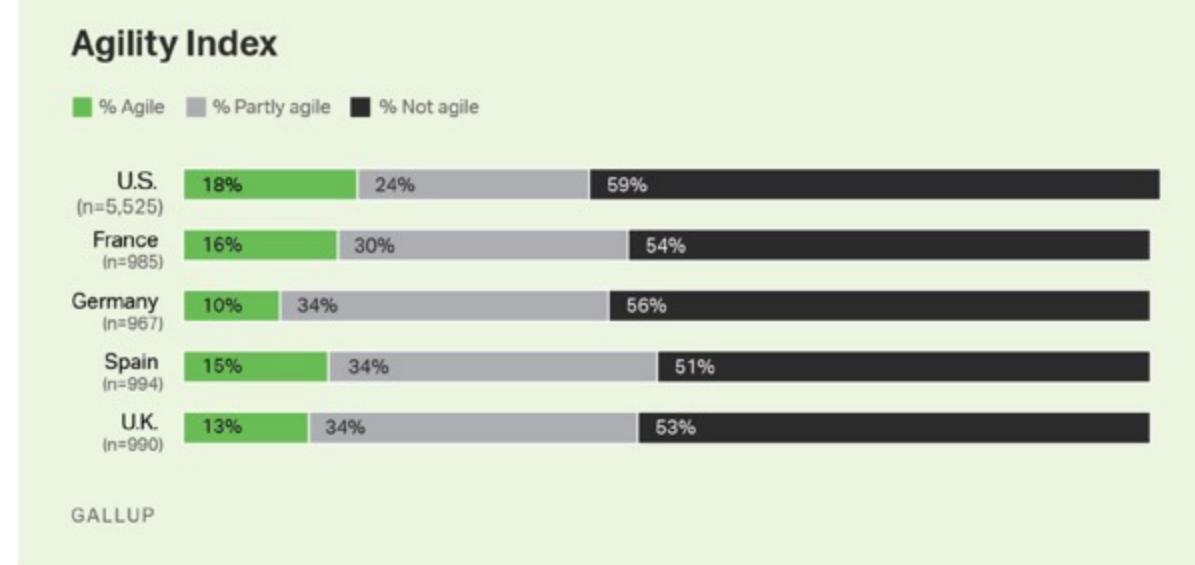
USING CHARTS & GRAPHS IN REPORTS

RULE #2: Include a narrative or introduction *before* the visual is inserted.



As you can see in Figure 3, among top economies, U.S. companies are leading overall in agility. German companies are lagging in full agility, but they rank second in partial agility.

Figure 3: Agility Index among Top 500 Companies in the U.S. and Europe



PART IV/V DV IN PRACTICE



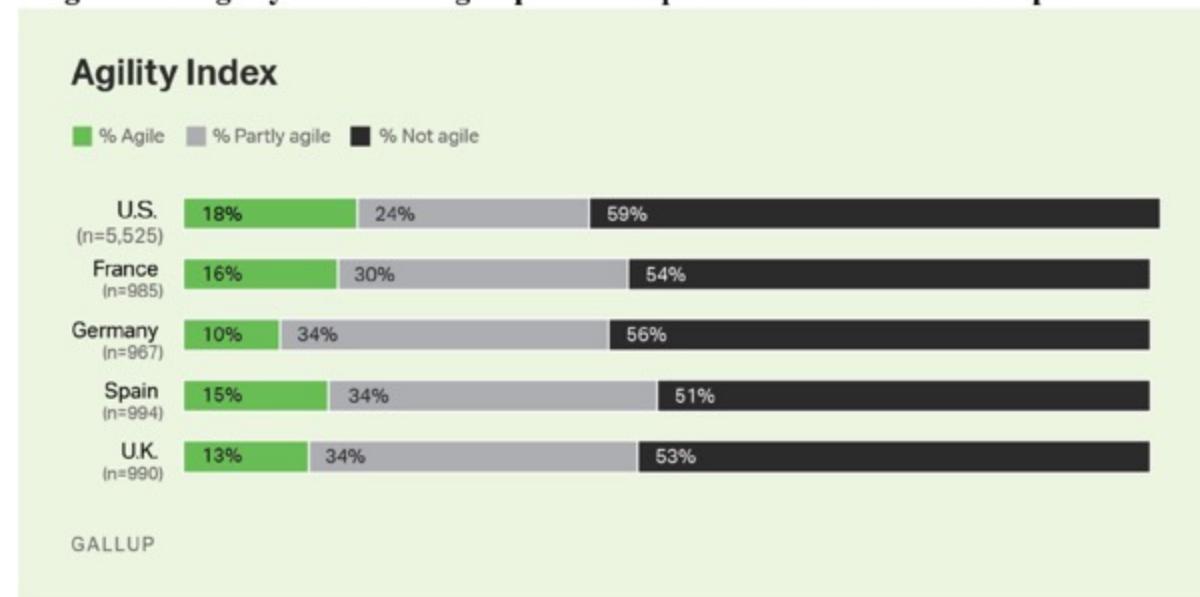
USING CHARTS & GRAPHS IN REPORTS

RULE #3: Label, title, and caption graphics outside of graph itself. All graphics labeled as “Figure” in numerical order; all tables as “Table.” Titles should be descriptive, not generic. Consider captions for added info.



As you can see in Figure 3, among top economies, U.S. companies are leading overall in agility. German companies are lagging in full agility, but they rank second in partial agility.

Figure 3.7: Agility Index among Top 500 Companies in the U.S. and Europe



PART IV/V DV IN PRACTICE



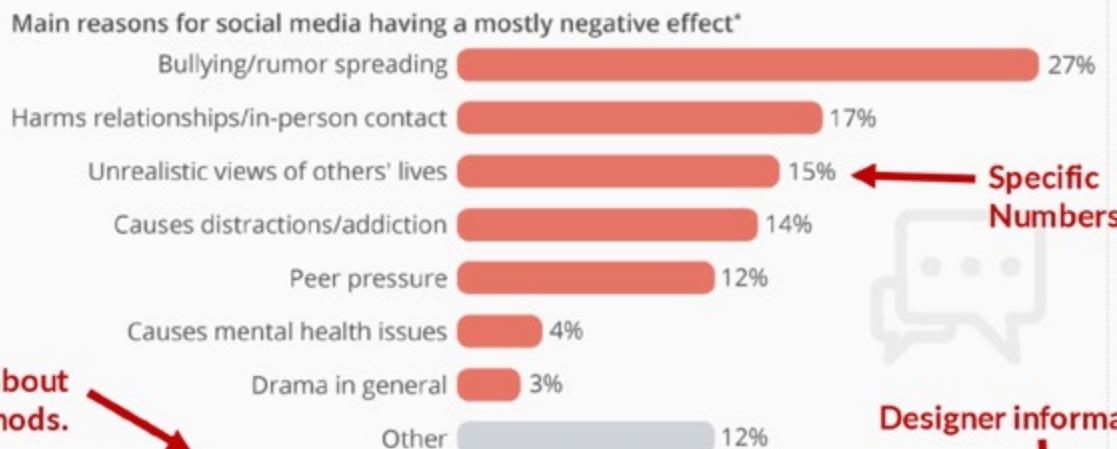
USING CHARTS & GRAPHS IN REPORTS

RULE #4: The graph should stand alone. Specifics and clarity are key. Be sure to cite source of data.

Descriptive title →
Subtitle →

U.S. Teens Have Mixed Feelings About Social Media

% of U.S. teens saying social media has a mostly positive/negative effect on people their age



Added detail about research methods.

Specific Numbers
Designer information.
statista

Copyright information.



* Verbatim responses have been coded into categories; multiple responses were allowed
Based on a survey of 743 U.S. teens (ages 13-17) conducted in March and April 2018
Source: Pew Research Center

ACT V

COURSE REVIEW



- >> EXPRESS WITH VISUALS
- >> RELATE WITH DELIVERY

CONCLUSION



REVIEW



VISUALIZE YOUR DATA

Clarity

Data visualization brings focus to otherwise fuzzy, complex, or seemingly disconnected data.

Meaning

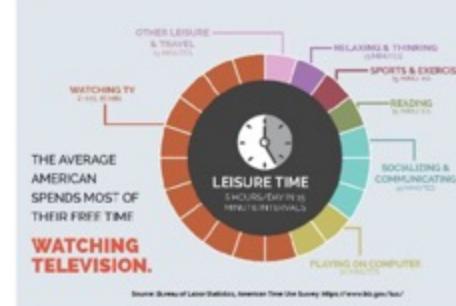
Data visualization turns abstract numbers and data into things from which we can compare and draw conclusions.

Persuasion

Data visualization helps persuade people to do something with the data—conduct more research, change a behavior, or think in a new way.

9	5	7	9	6	4	7	3	8	1	2	5	8	4	6	3	9	1	5	7
3	1	5	6	4	3	6	7	1	2	6	8	9	5	4	7	5	6	5	7
4	2	1	3	2	5	4	1	2	3	2	5	8	6	4	7	5	6	8	8
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6	8	8	4	7	4	2	5	7	9	6	4	7	3	8	1	2	5	8	4
6	3	9	1	5	7	3	1	5	9	4	3	6	7	1	2	6	8	9	5
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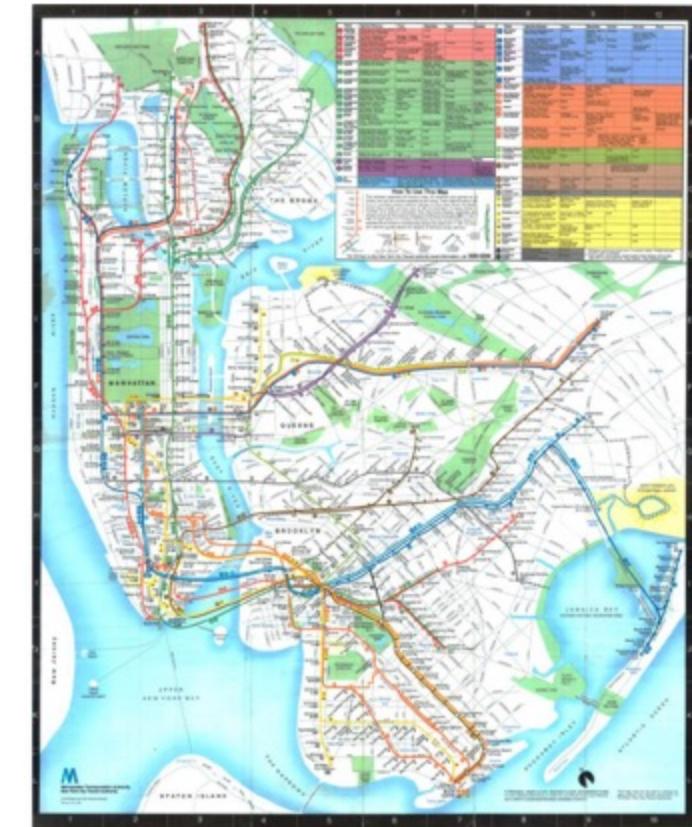
Table A-1: Time spent in selected primary activities and percent of the civilian population engaging in each activity, averages per day by sex, 2017			
Activity	Average time spent (min)	Average percent engaged (all day)	Average percent engaged (12 hr)
Total	4,600	100.00	100.00
Personal care activities	1,000	22.00	22.00
Meals, eating, and drinking	1,000	22.00	22.00
Housework and care of home	1,000	22.00	22.00
Transportation and related uses	1,000	22.00	22.00
Entertainment, sports, and hobbies	1,000	22.00	22.00
Reading, writing, and working	1,000	22.00	22.00
Relaxing, socializing, and sleeping	1,000	22.00	22.00
Business, work, and volunteer	1,000	22.00	22.00
Leisure time	1,000	22.00	22.00
Other leisure	1,000	22.00	22.00
Watching TV	1,000	22.00	22.00
Reading	1,000	22.00	22.00
Socializing & communicating	1,000	22.00	22.00
Playing on computer	1,000	22.00	22.00
Other	1,000	22.00	22.00



CONCLUSION

BE PERSUASIVE

REVIEW

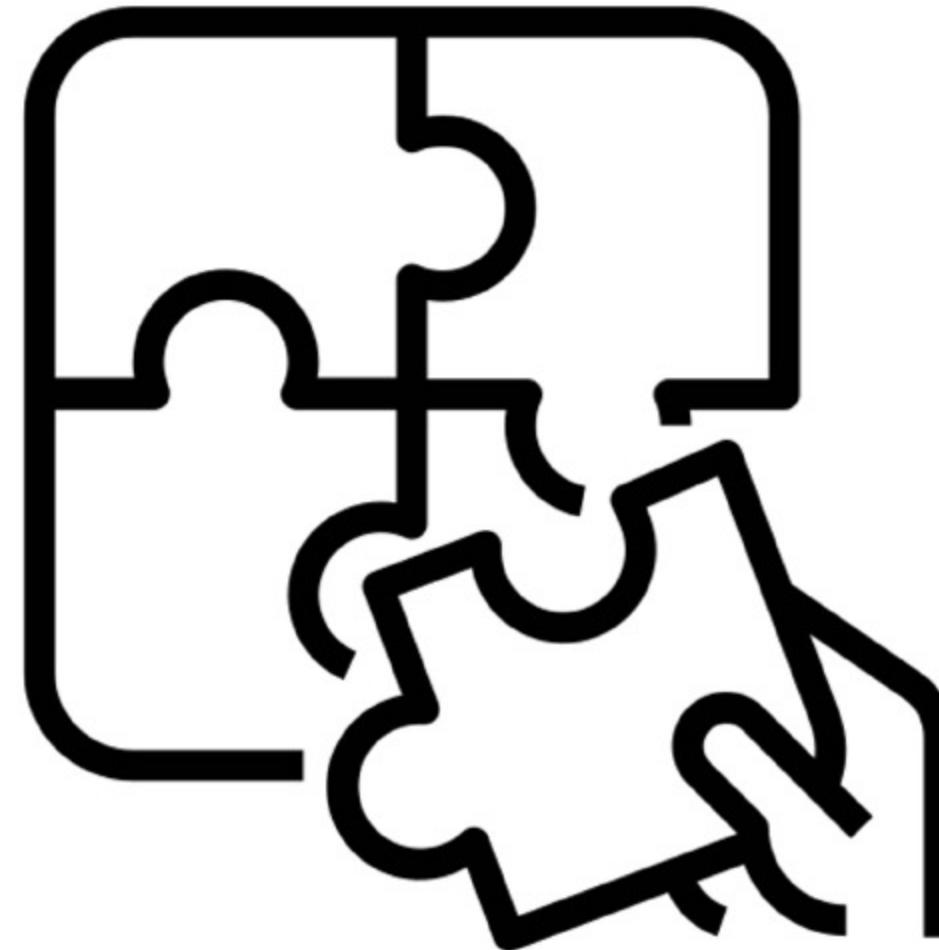


CONCLUSION

REVIEW



UNDERSTAND YOUR DATA



CONCLUSION

REVIEW



ASK SIX QUESTIONS



Am I highlighting just
ONE IMPORTANT FACT?



Am I making a
**COMPARISON BETWEEN
TWO OR MORE THINGS?**



Am I showing the results of
**A SURVEY OR
QUESTIONNAIRE?**



Am I describing how the
**PARTS RELATE TO A
WHOLE?**



Am I showing how
**ONE PIECE OF DATA
CHANGES AS ANOTHER
DOES?**



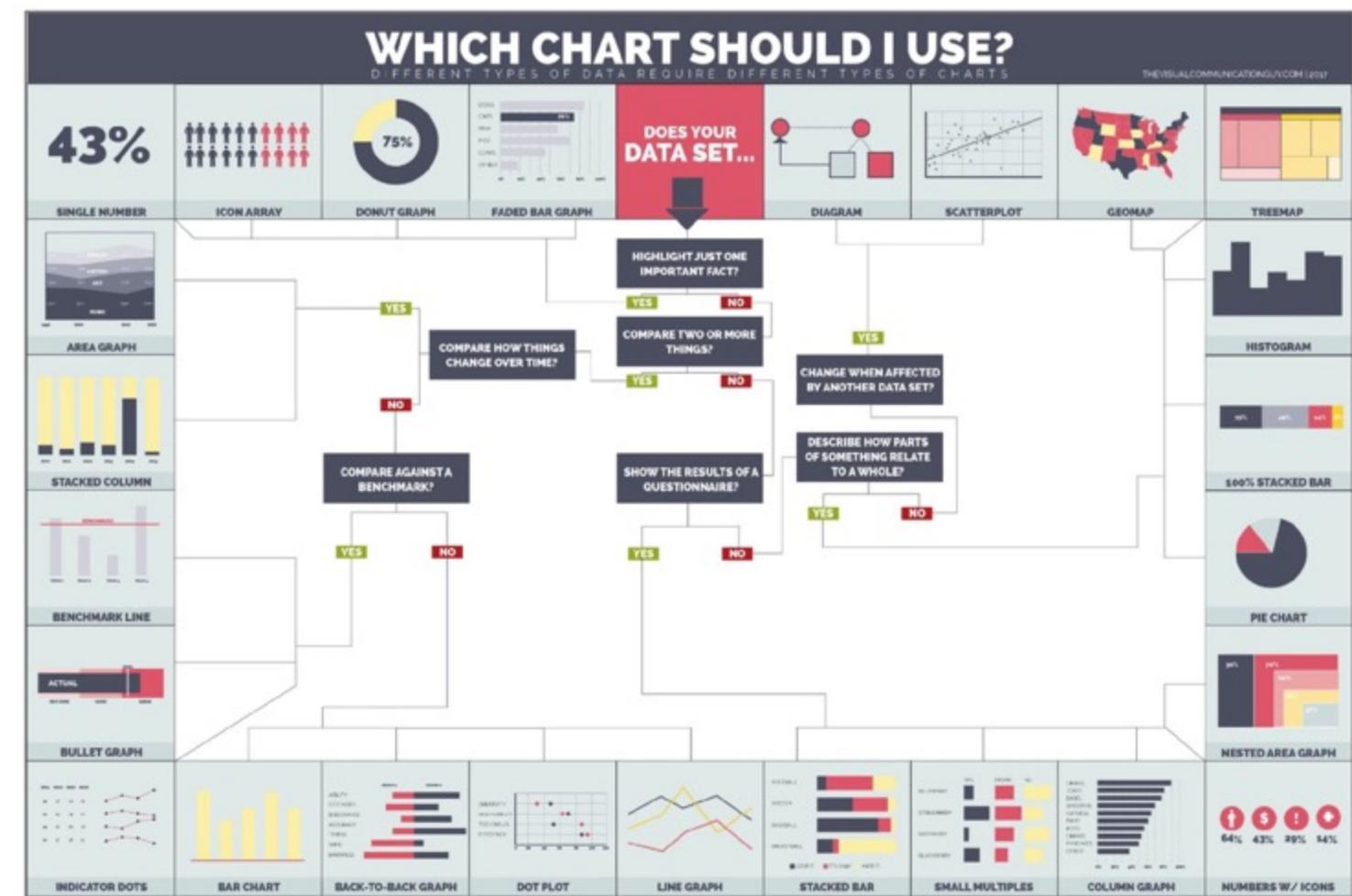
Does my data even need a graph?
**ARE WORDS, PICTURES,
DIAGRAMS, or ILLUSTRATIONS
BETTER?**

CONCLUSION

REVIEW



CHOOSE BEST OPTION



Designed by Curtis Newbold | TheVisualCommunicationGuy.com

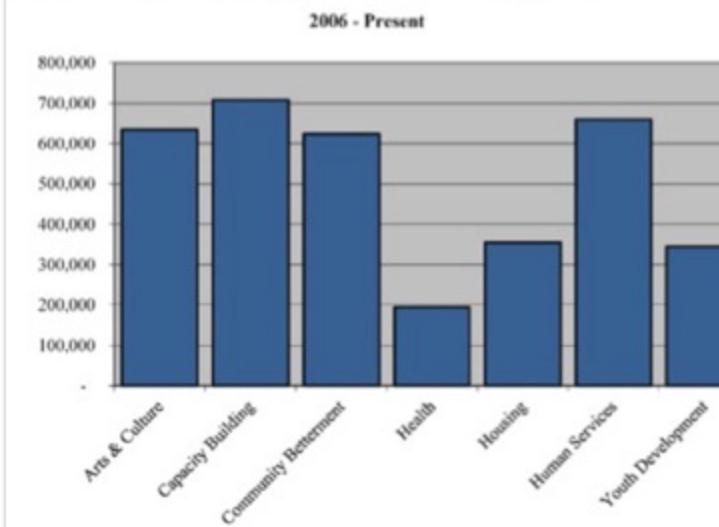
CONCLUSION

REVIEW

BE STRATEGIC



Investment by area of impact



From: StorytellingWithData.com | <http://www.storytellingwithdata.com/blog/2012/10/my-pendant-for-horizontal-bar-graphs>

We invest primarily in four areas

Since we began investing in 2006, **four areas have received more than \$600K each, accounting for 75% of total grantmaking activity**

Investment by Area of Impact
2006 - Present

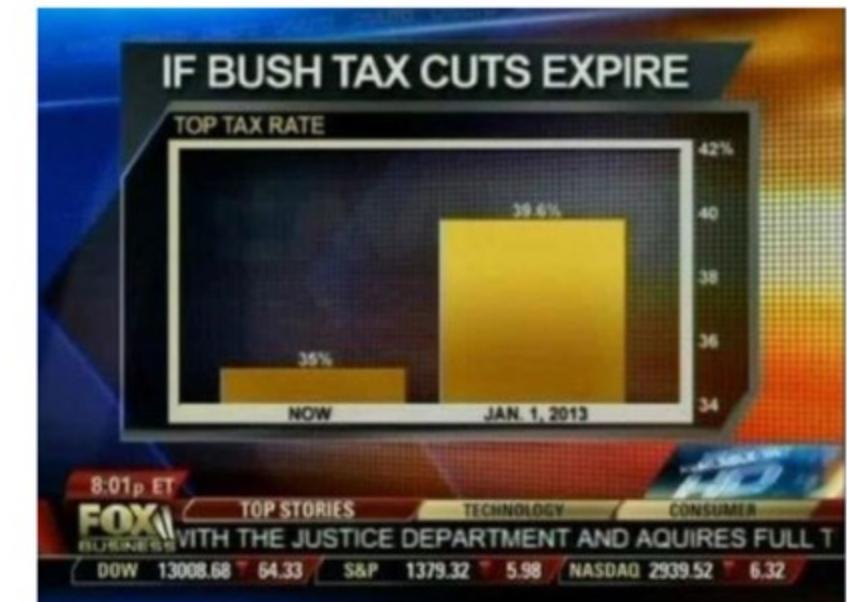
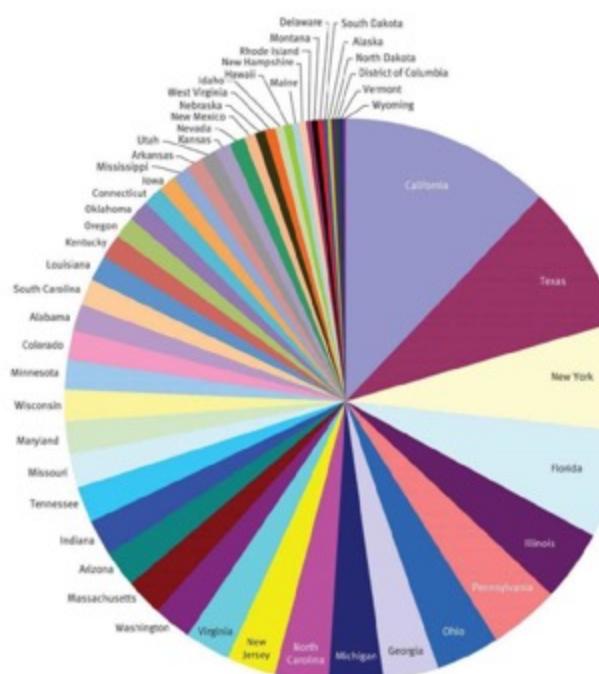


CONCLUSION

REVIEW



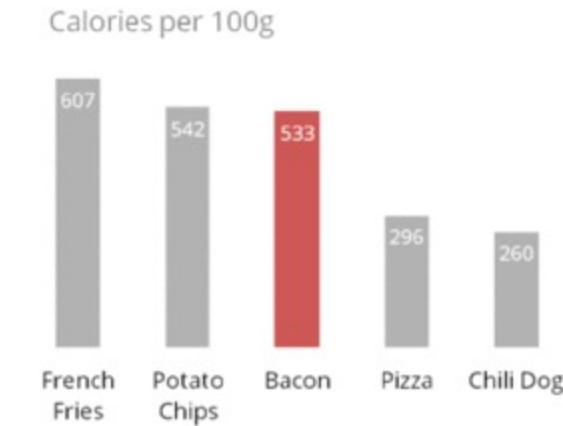
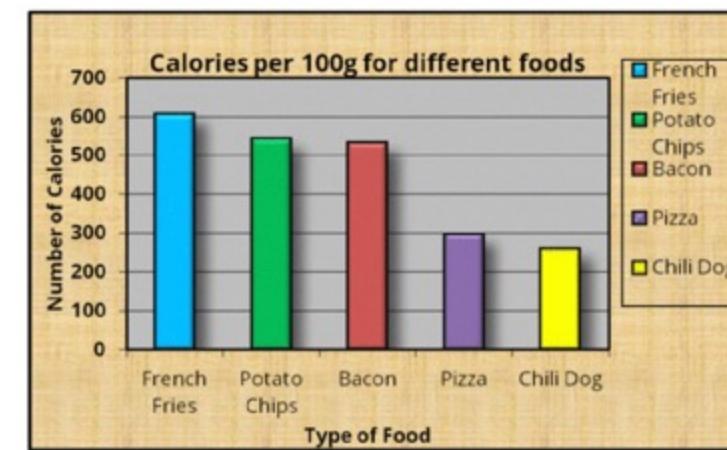
AVOID FAUX PAS



CONCLUSION

REVIEW

SIMPLIFY YOUR DESIGN



CONCLUSION



REVIEW

FOLLOW CONVENTIONS

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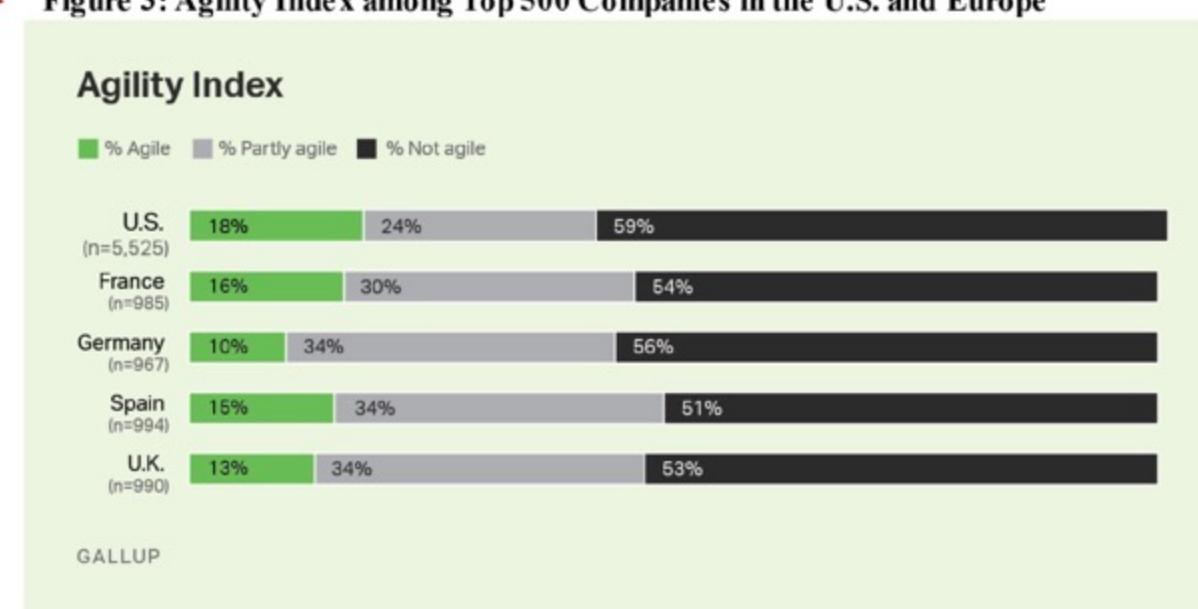
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CONCLUSION

REVIEW

INTRO, LABEL, & TITLE

- As you can see in Figure 3, among top economies, U.S. companies are leading overall in agility. German companies are lagging in full agility, but they rank second in partial agility.
- Figure 3: Agility Index among Top 500 Companies in the U.S. and Europe



CONCLUSION

REVIEW

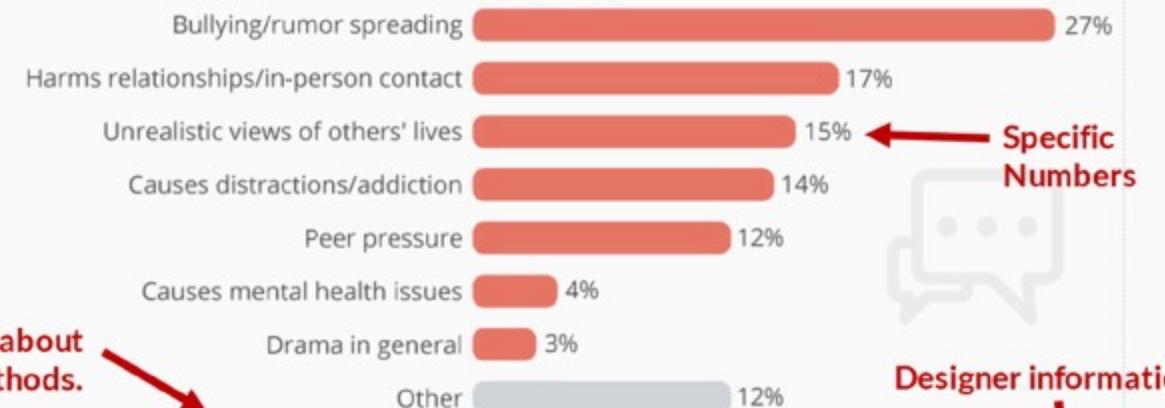
MAKE IT STAND ALONE

Descriptive title →
Subtitle →

U.S. Teens Have Mixed Feelings About Social Media
% of U.S. teens saying social media has a mostly positive/negative effect on people their age



Main reasons for social media having a mostly negative effect*



Added detail about research methods.

Copyright information.



* Verbatim responses have been coded into categories; multiple responses were allowed
Based on a survey of 743 U.S. teens (ages 13-17) conducted in March and April 2018
Source: Pew Research Center

Designer information.



CONCLUSION

REVIEW

GET SECOND OPINION



CONCLUSION



“When something can be read without effort, great effort has gone into its writing.”

- Enrique Jardiel Poncela

QUESTIONS OR THOUGHTS?

THANKS FOR JOINING TODAY!



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 | Curtis Newbold

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