

Ethical and Deceptive Visualization



Michael Correll
Tableau Research

Questions

What Makes A Visualization *Deceptive*?

What Makes a Visualization *Ethical*?

Questions

What Makes A Visualization *Deceptive*?

What Makes a Visualization *Ethical*?

"A great introduction to the use of statistics,
and a great refresher for anyone who's already
well versed in it." —**BILL GATES**

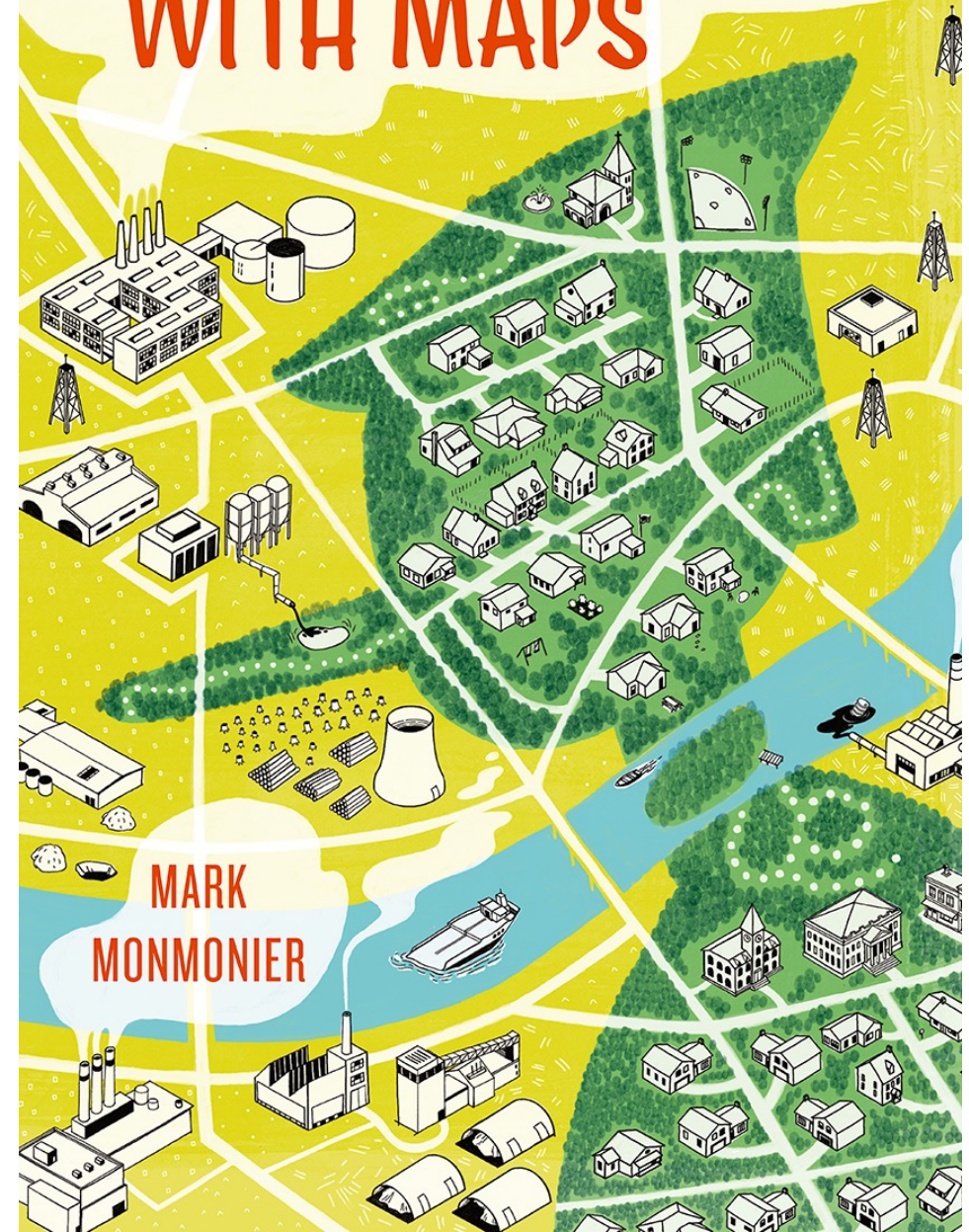
HOW TO LIE WITH STATISTICS



DARRELL HUFF
Illustrated by **Irving Geis**
An Honest-to-Goodness Bestseller

HOW TO LIE WITH MAPS

3rd Edition



Bad Visualizations

Incorrect Visualizations

Illegible Visualizations

Bullshit Visualizations

Deceptive Visualizations

Incorrect Visualization

2010 Georgia Approval Ratings by Region

In a Georgia Newspaper Partnership poll, residents were asked if they approve or disapprove of their government. Select a politician or legislative branch to see how Georgia residents rated them.

- BARACK OBAMA
- U.S. CONGRESS
- G.A. STATE LEGISLATURE
- SONNY PERDUE

Statewide Results:

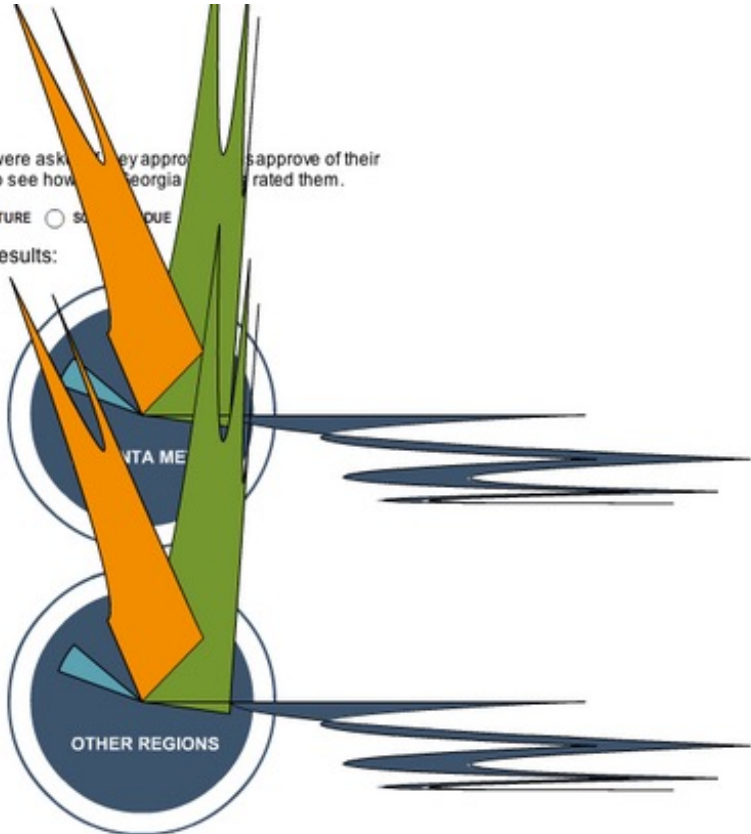
Barack Obama
 Approve: 37 %
 Disapprove: 52 %
 Not Sure: 11 %

U.S. Congress
 Approve: 21 %
 Disapprove: 60 %
 Not Sure: 19 %

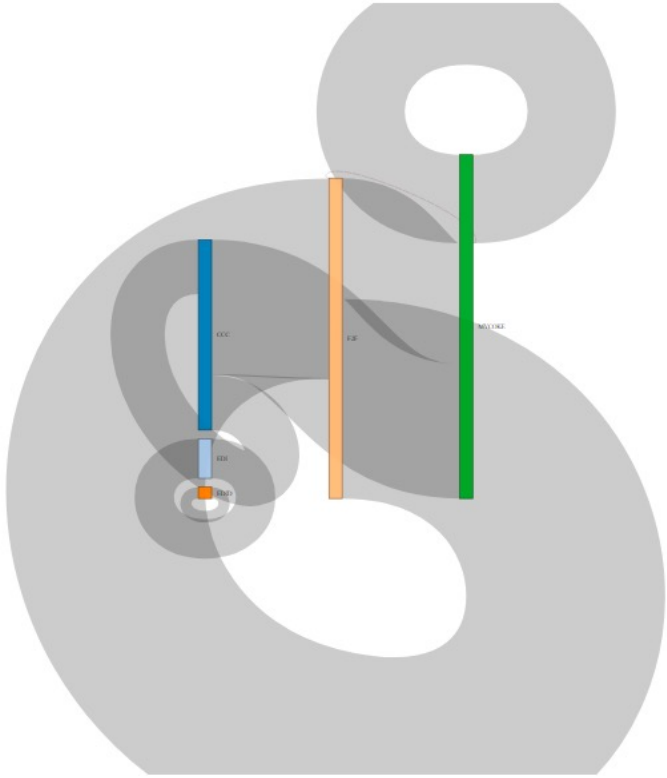
State Legislature
 Approve: 39 %
 Disapprove: 37 %
 Not Sure: 24 %

Sonny Perdue
 Approve: 45 %
 Disapprove: 42 %
 Not Sure: 13 %

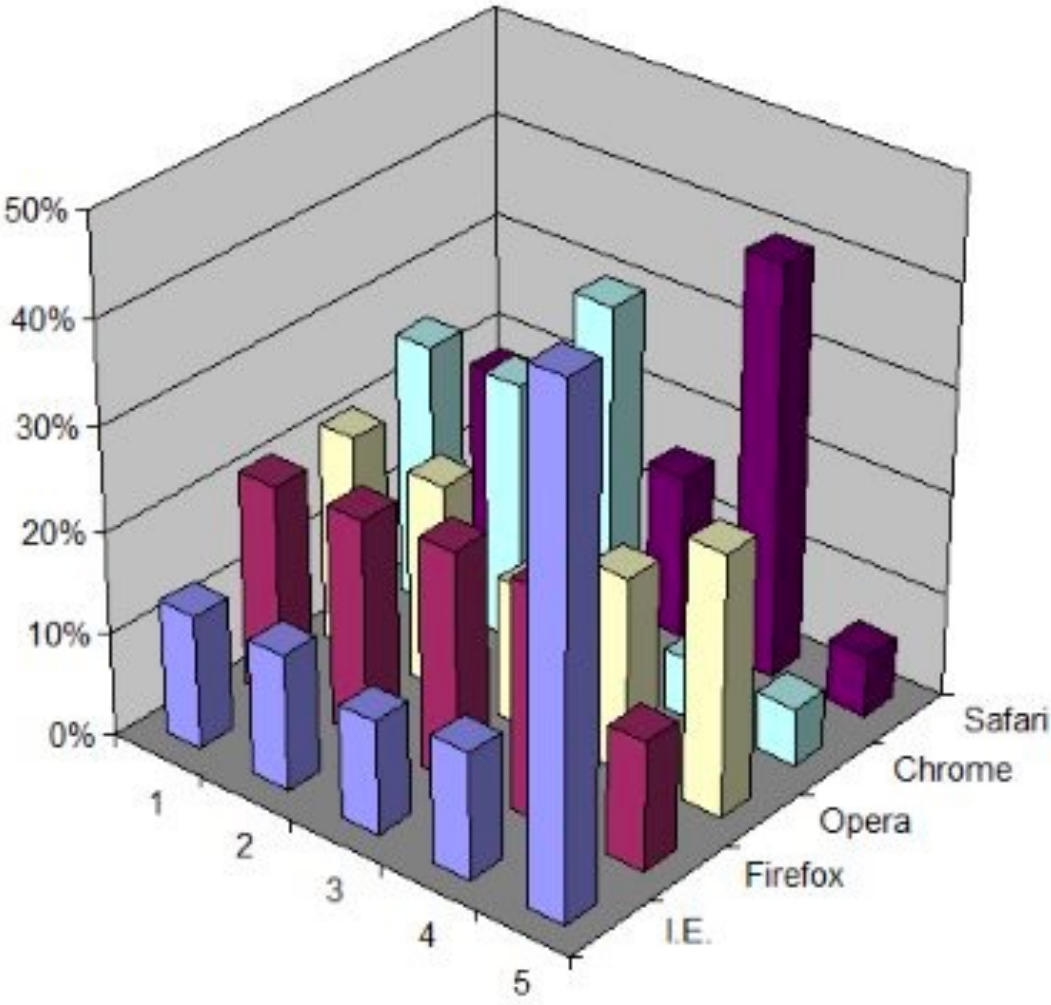
Regional Results:



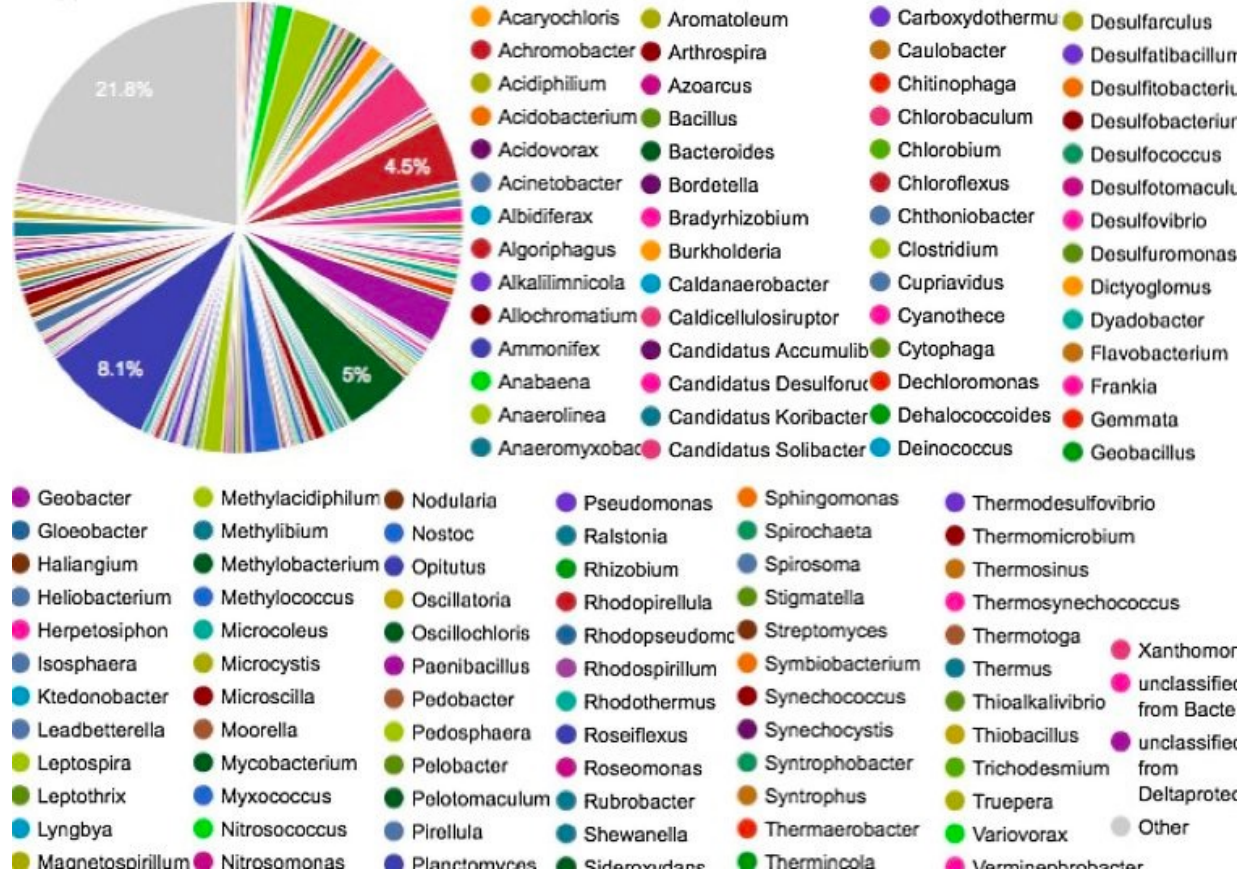
Percent of Polled Residents
 Approve Disapprove Not Sure



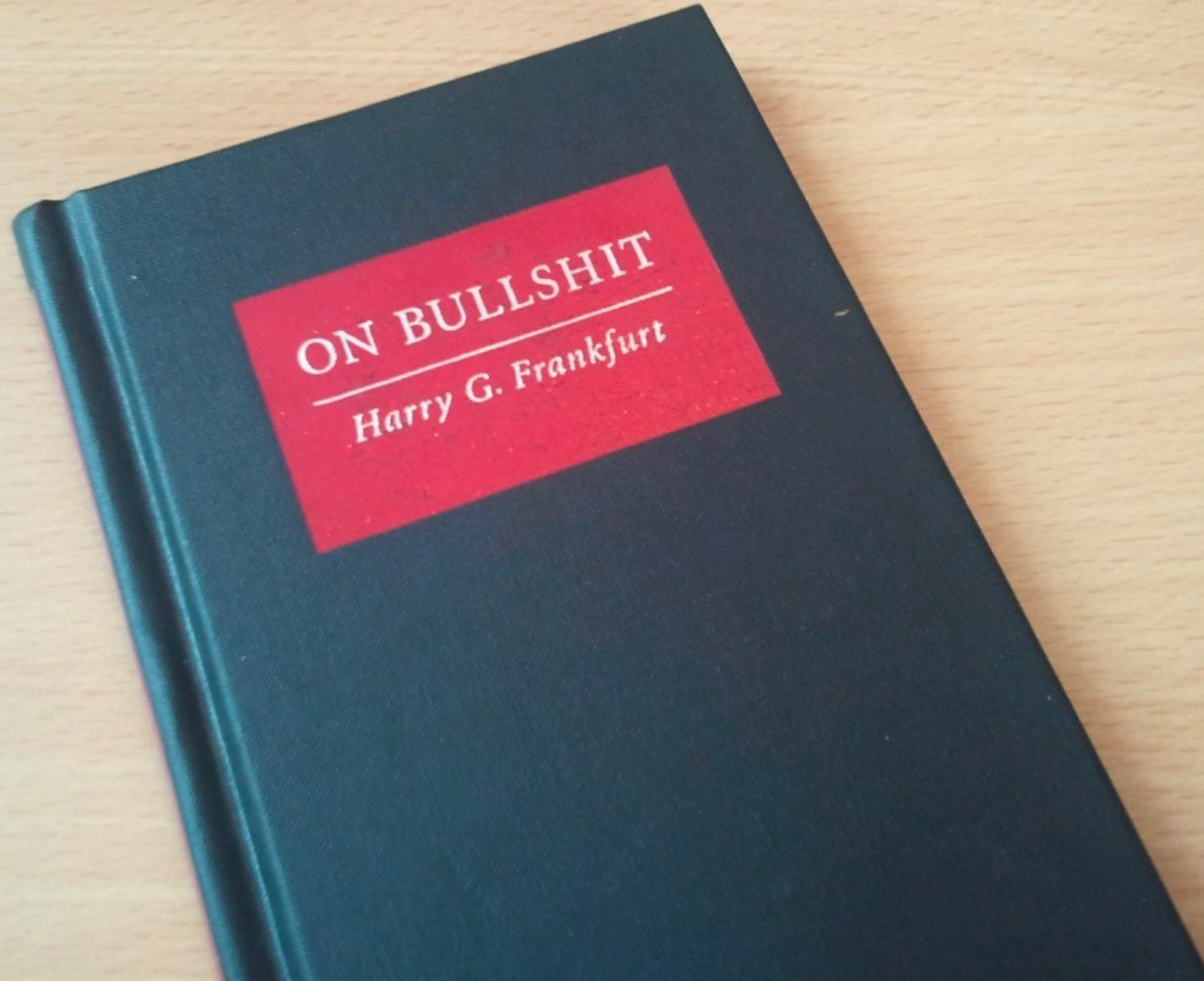
Illegible Visualization



(f) Distribution of Genus



Bullshit Visualization



Lie:

“No, officer, I wasn’t speeding”

(you know the truth, but intentionally say something you know is untrue)

Bullshit:

“The party was lame anyways, it’s good I wasn’t invited”

(you don’t know or don’t care about the truth, but intentionally say something you hope is persuasive)



Number decoration

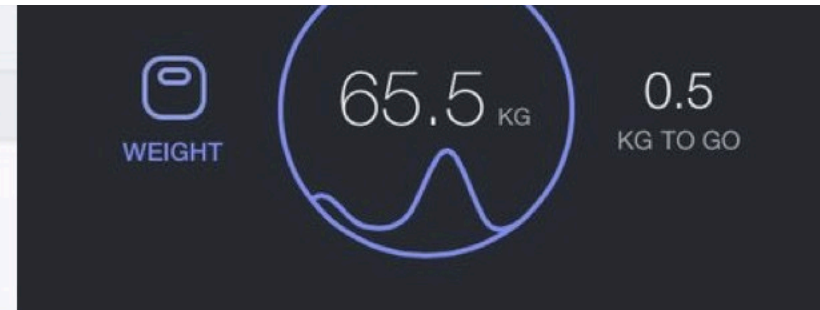


Moritz Stefaner [Follow](#)

Truth & Beauty Operator

Editor of Visualizing, The Field

474 Following 5.1K Followers



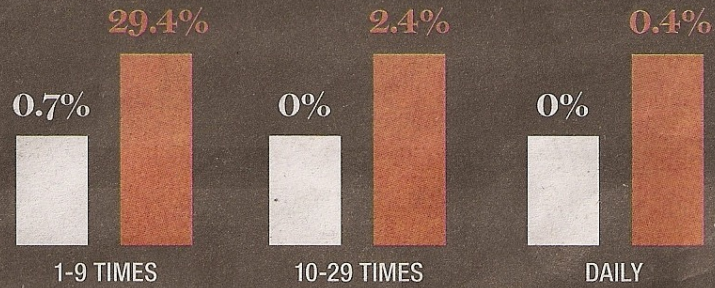
Registered Trainees

Trainees	Age	Mail	Activity	Share	Likes
David Truty	20	davidtruty@gmail.com	Student	5	1
Robin Lazenby	23	robin@collect.com	Programmer	4	3
Bradon Barber	34	bradonbb@gmail.com	Student	1	1

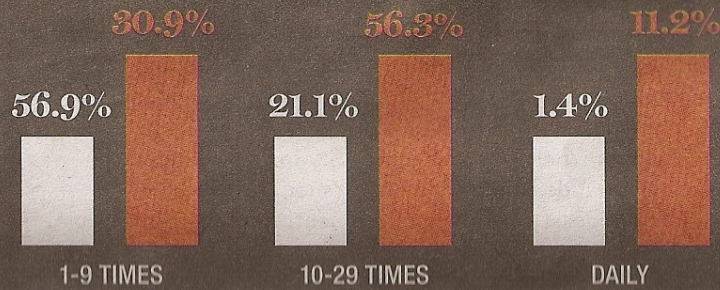
BY THE NUMBERS

The National Collegiate Health Assessment was taken by 1,000 UCSB students in Spring 2009. Participants were asked how frequently they used substances over the past 30 days. Numbers in white reflect actual student use, while red numbers indicate perceived substance use. The average age of participants was 20 years and approximately 99 percent were full-time students.

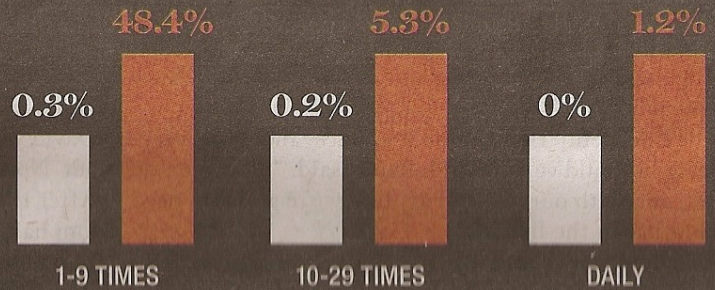
OPIATES



ALCOHOL



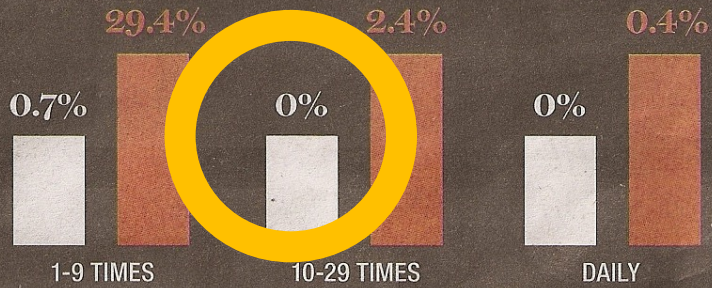
COCAINE



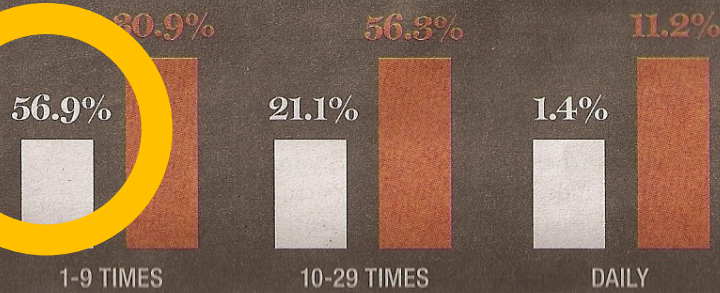
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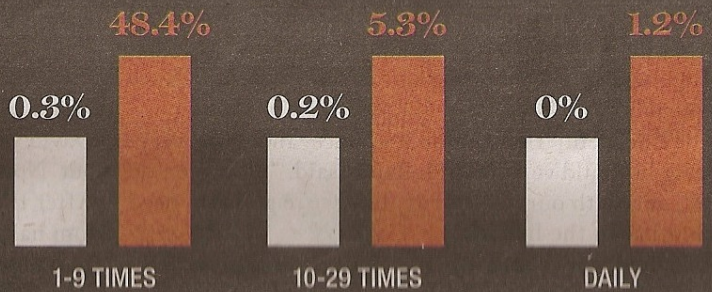
OPIATES



ALCOHOL



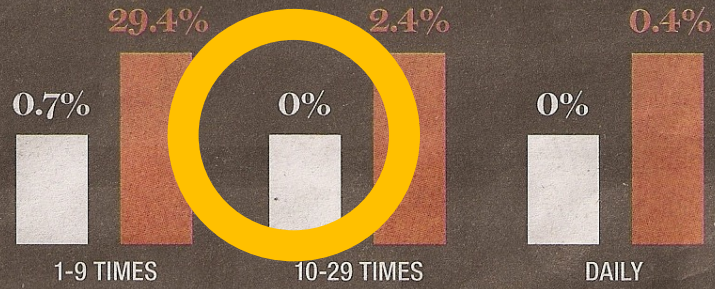
COCAINE



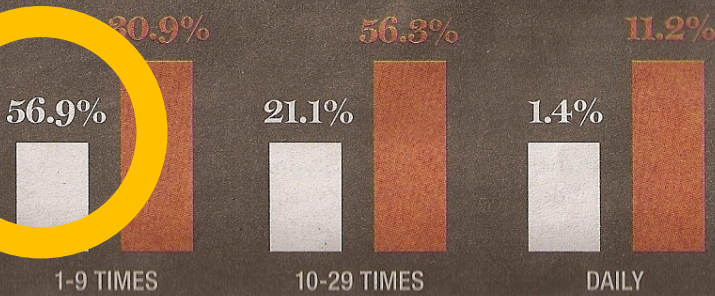
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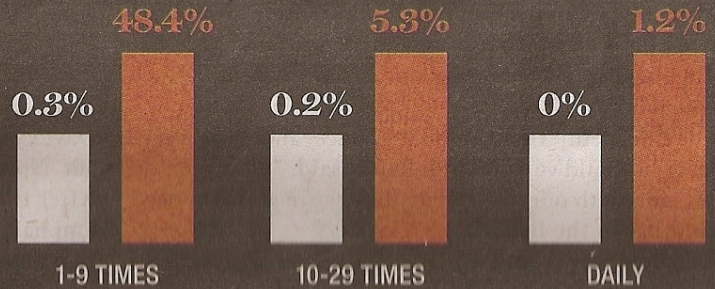
OPIATES



ALCOHOL



COCAINE



Opiates

Alcohol

Cocaine

	1-9 Times		10-29 Times		Daily	
Rate	Actual	Perceived	Actual	Perceived	Actual	Perceived
Opiates	0.7%	29.4%	0.0%	2.4%	0.0%	0.4%
Alcohol	56.9%	30.9%	21.1%	56.3%	1.4%	11.2%
Cocaine	0.3%	48.4%	0.2%	5.3%	0.0%	1.2%

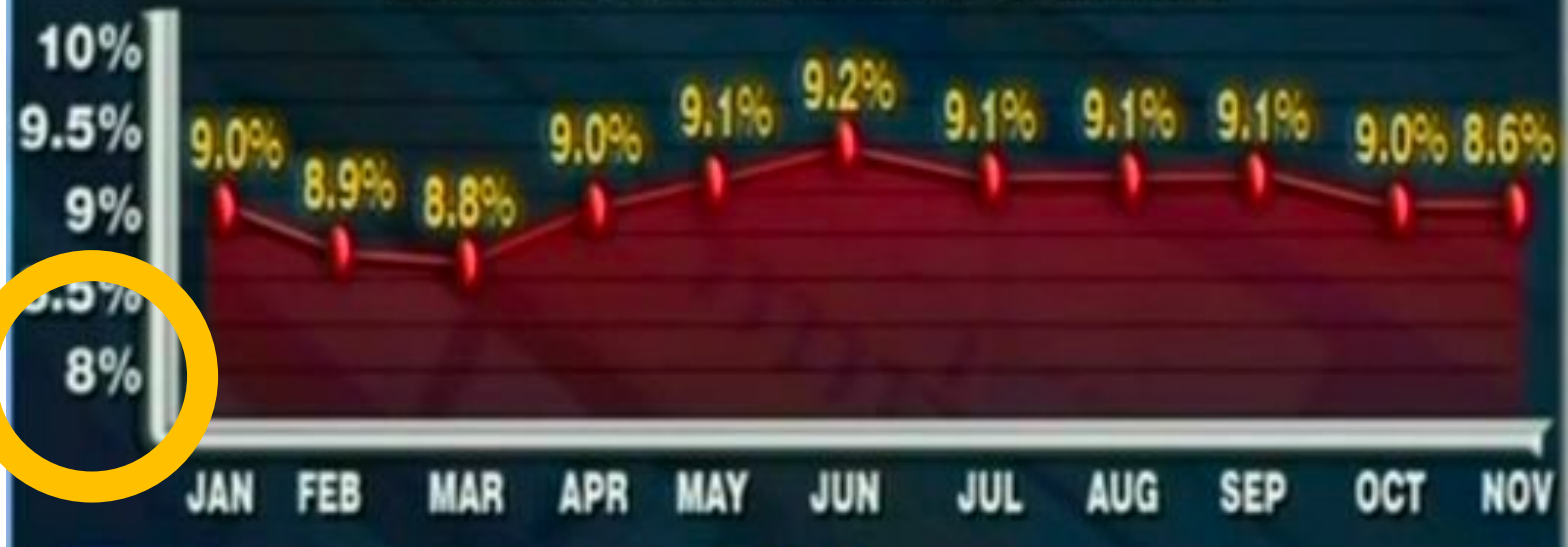
UNEMPLOYMENT RATE

UNDER PRESIDENT OBAMA



UNEMPLOYMENT RATE

UNDER PRESIDENT OBAMA



UNEMPLOYMENT RATE

UNDER PRESIDENT OBAMA



UNEMPLOYMENT RATE

UNDER PRESIDENT OBAMA



UNEMPLOYMENT RATE

UNDER PRESIDENT OBAMA



UNEMPLOYMENT RATE

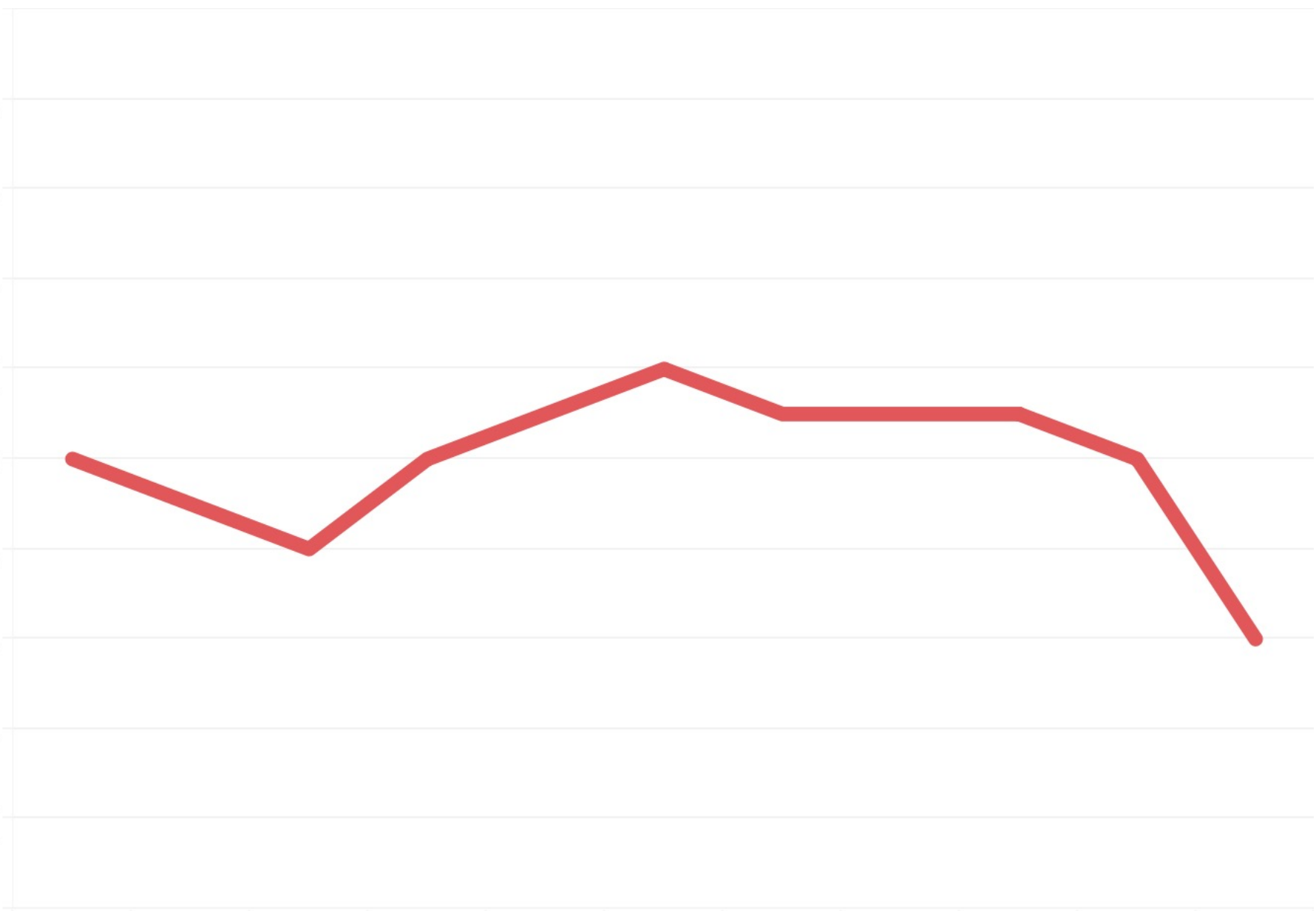
UNDER PRESIDENT OBAMA



Unemployment

9.8
9.6
9.4
9.2
9.0
8.8
8.6
8.4
8.2

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov



Deceptive Visualization

The background features a minimalist, abstract pattern of black and grey geometric shapes. These include thin, hand-drawn style lines of various orientations, solid black circles of different sizes, and 'x' marks. The shapes are scattered across the white background, creating a sense of movement and depth. The central text is framed by several horizontal lines, some of which are slightly wavy, suggesting a hand-drawn or layered aesthetic.

DARK PATTERNS

(They're Everywhere)

Dark Patterns



The screenshot shows a web browser window displaying the Softpedia page for 'OnyX for Mac'. The page features a dark blue navigation bar with 'SOFTPEDIA' and menu items like 'DESKTOP', 'MOBILE', 'WEB', and 'NEWS'. Below the navigation, there's a breadcrumb trail: 'Softpedia > Mac > System Utilities > OnyX'. A red alert banner for '2016 Holiday Giveaways!' is visible. The main heading is 'OnyX for Mac' with a red plus icon. A prominent blue 'DOWNLOAD' button is present, along with statistics: '177,446 downloads', 'Updated: October 15th, 2016', 'DONATIONWARE', and a 5.5/5 star rating. A 'CURRENT VERSION' section shows 'OnyX 3.2.1' and a 'SEND US AN UPDATE' link. A large 'Start Download' section contains a 'DOWNLOAD NOW' button and a 3-step process: '1. Click Download', '2. Run the quick scan', and '3. Enjoy your clean Mac'. Below this, there are tabs for 'EDITOR'S REVIEW', 'DOWNLOAD', 'SPECIFICATIONS', and 'CHANGELOG', along with '100% CLEAN' and 'REPORT MALWARE' buttons. A descriptive paragraph states: 'Free OS X application designed to help you perform a large variety of optimization, maintenance, and customization tasks via a very simple and intuitive interface'. A sidebar on the left includes '17 SCREENSHOTS', 'IN-DEPTH REVIEW', 'FILE SIZE: 34.8 MB', 'RUNS ON: macOS 10.12 or later (Intel only)', 'CATEGORY: Home | System Utilities', and 'DEVELOPER:'. A vertical 'STICKY' label is on the right. At the bottom, there's an image of a person using a laptop with the text 'Download Cleaner' below it.

Dark Patterns

The image shows a screenshot of the Softpedia website for the application 'Onyx for Mac'. The browser address bar shows the URL 'mac.softpedia.com/get/System-Utilities/Onyx.shtml'. The website has a dark blue header with the 'SOFTPEDIA' logo and navigation links for 'DESKTOP', 'Mac', 'MOBILE', 'WEB', and 'NEWS'. A navigation breadcrumb shows 'Softpedia > Mac > System Utilities > Onyx'. An alert banner at the top right says 'ALERT 2016 Holiday Giveaways!'. The main content area features a large 'DOWNLOAD' button with a download icon, highlighted by an orange box. Below this, there are statistics: '177,446 downloads', 'Updated: October 15th, 2016', 'DONATIONWARE', and a 5.5/5 star rating. A 'CURRENT VERSION' section lists 'Onyx 3.2.1' and a 'SEND US AN UPDATE' link. A 'Start Download' section includes a 'DOWNLOAD NOW' button and a three-step process: '1. Click Download', '2. Run the quick scan', and '3. Enjoy your clean Mac'. Below this, there are tabs for 'EDITOR'S REVIEW', 'DOWNLOAD', 'SPECIFICATIONS', and 'CHANGELOG', along with a '100% CLEAN' badge and a 'REPORT MALWARE' link. The main text describes Onyx as a 'Free OS X application designed to help you perform a large variety of optimization, maintenance, and customization tasks via a very simple and intuitive interface'. It mentions that tweaking applications for macOS comes in various shapes and prices, and that Onyx is a free and very complex macOS application. A small image shows a person using a laptop. At the bottom, there is a 'Download Cleaner' button.



Zone Kaiwei Ni factory
Sponsored

80% OFF

BLACK FRIDAY SALE



Shop Now



Dark Patterns in Visualization

Lie Factors

Scale Manipulation

Metric Manipulation

Tufte's Lie Factor

Lie Factor =

$$\frac{\text{The size of the effect shown in the graphic}}{\text{The size of the effect in the data}}$$

LF \cong 1 Good!

LF \gg 1 or LF \ll 1 Bad!

Tufte's Lie Factor

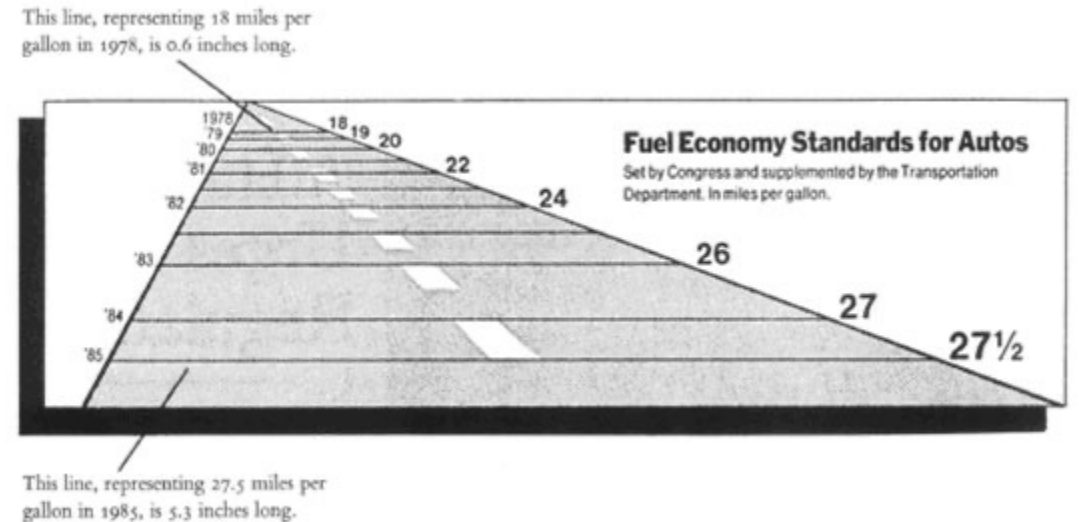
Lie Factor =
The size of the effect shown in the graphic
The size of the effect in the data

LF \cong 1 Good!

LF \gg 1 or LF \ll 1 Bad!

$$LF = [(5.3 - 0.6)/0.6] / [(27.5-18)/18]$$

LF = **14.8!**



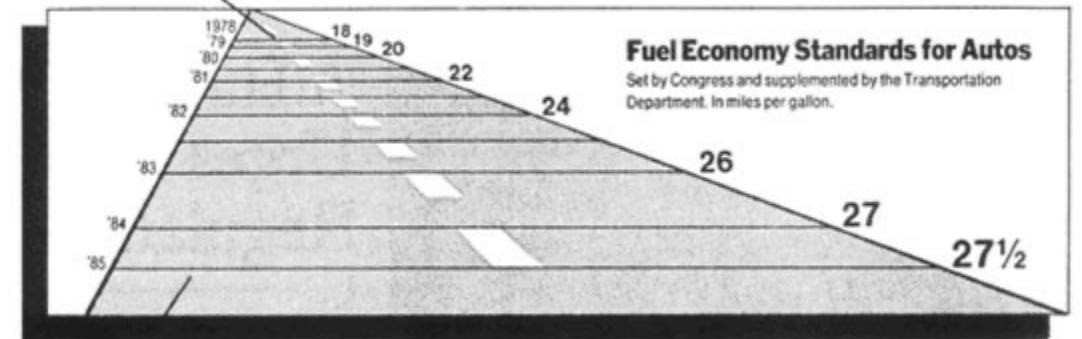
Tufte's Lie Factor

Lie Factor =
The size of the effect shown in the graphic
The size of the effect in the data

LF \cong 1 Good!

LF \gg 1 or LF \ll 1 Bad!

This line, representing 18 miles per gallon in 1978, is 0.6 inches long.



This line, representing 27.5 miles per gallon in 1985, is 5.3 inches long.

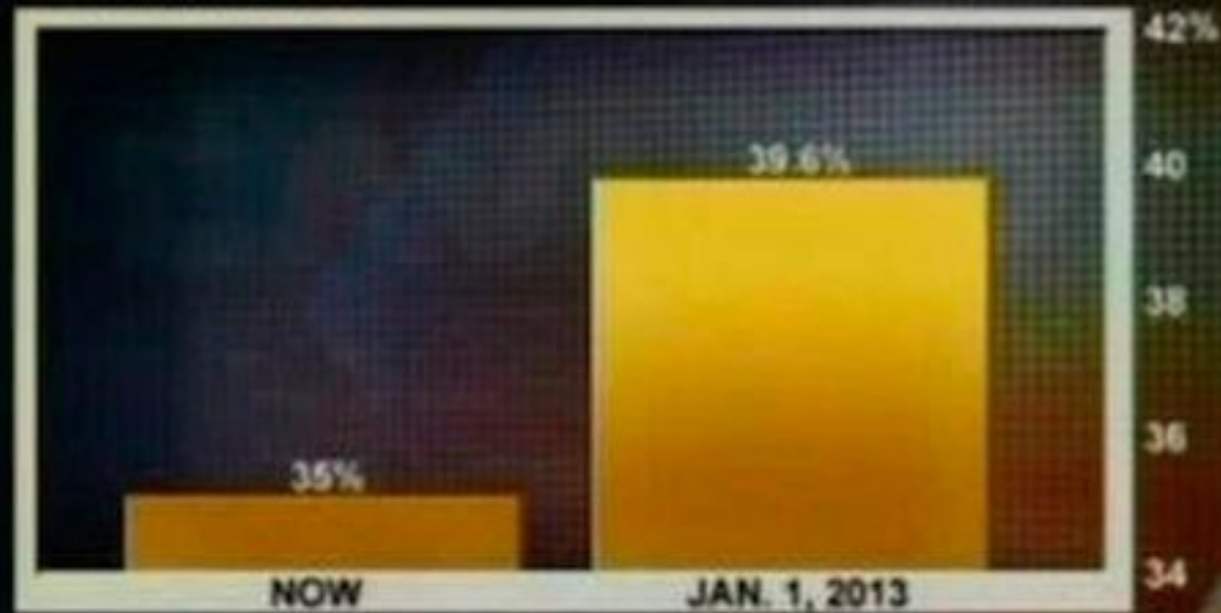
Lie Factor

Distorting the apparent size of the effect in your data, often through choosing ambiguous or non-standard encodings.

Scale Manipulation

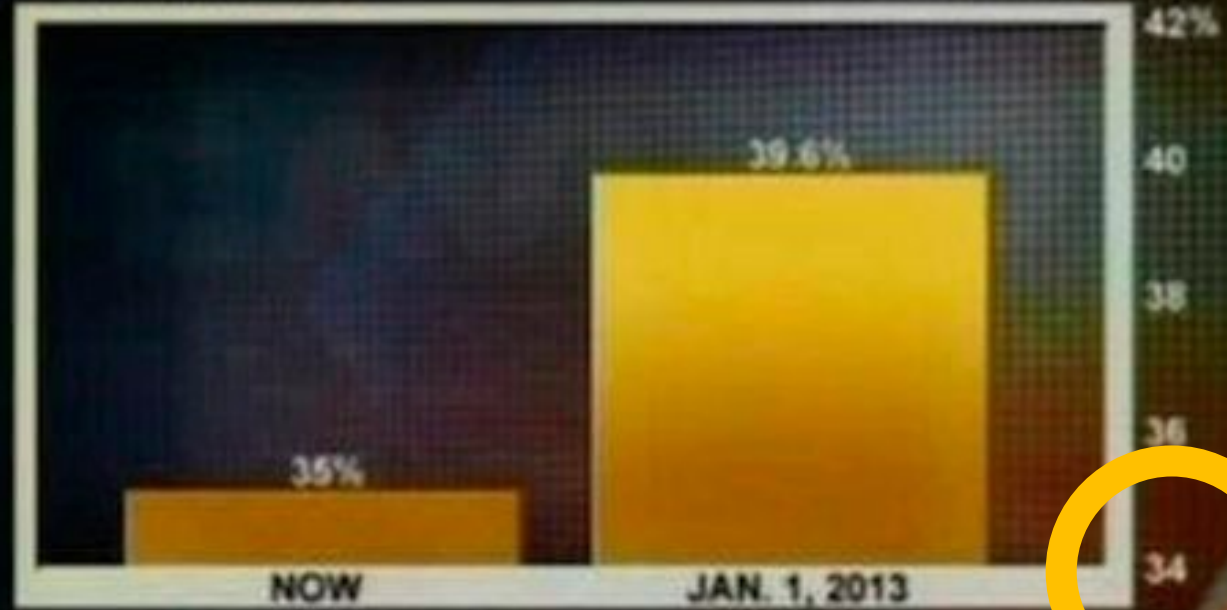
IF BUSH TAX CUTS EXPIRE

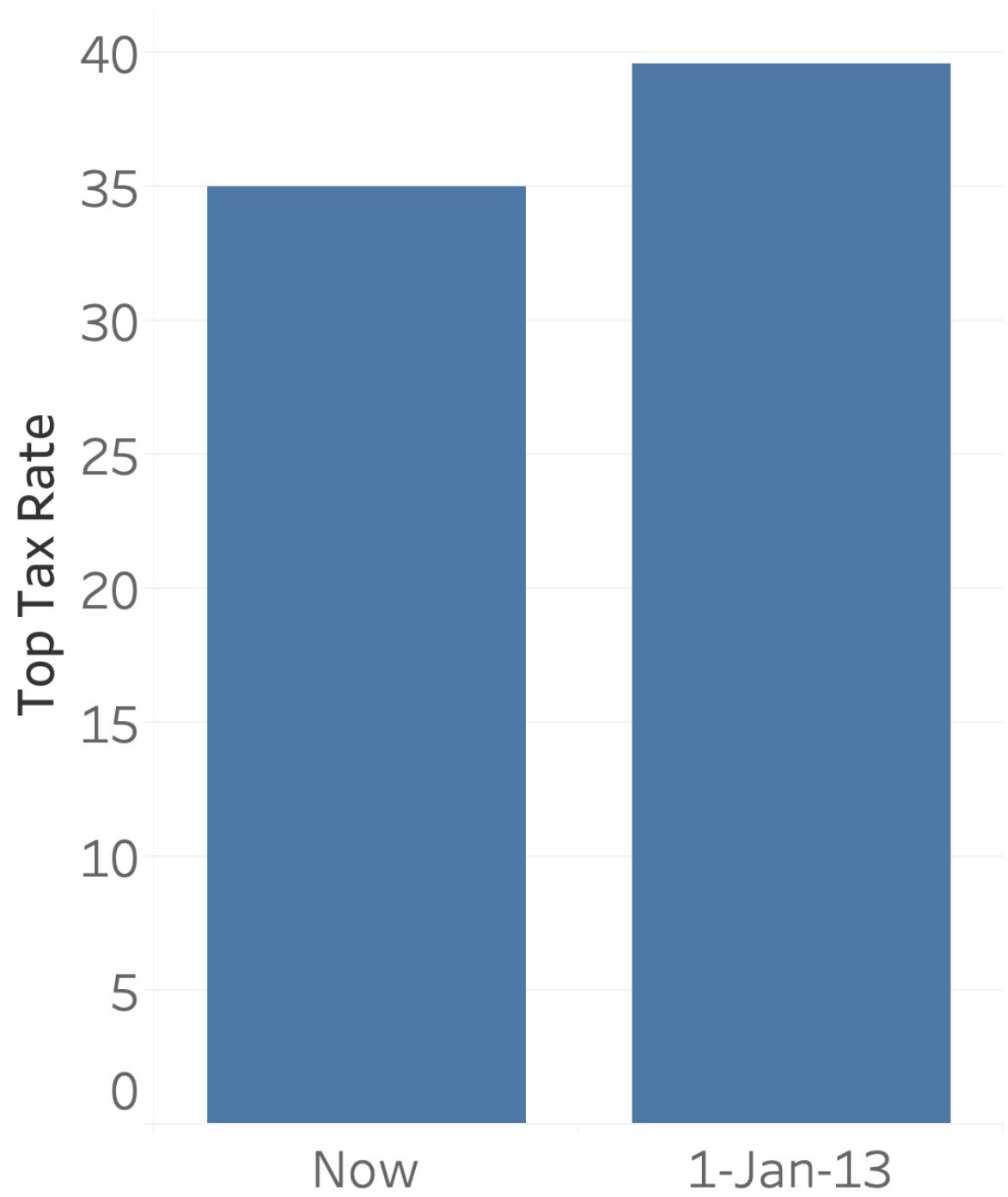
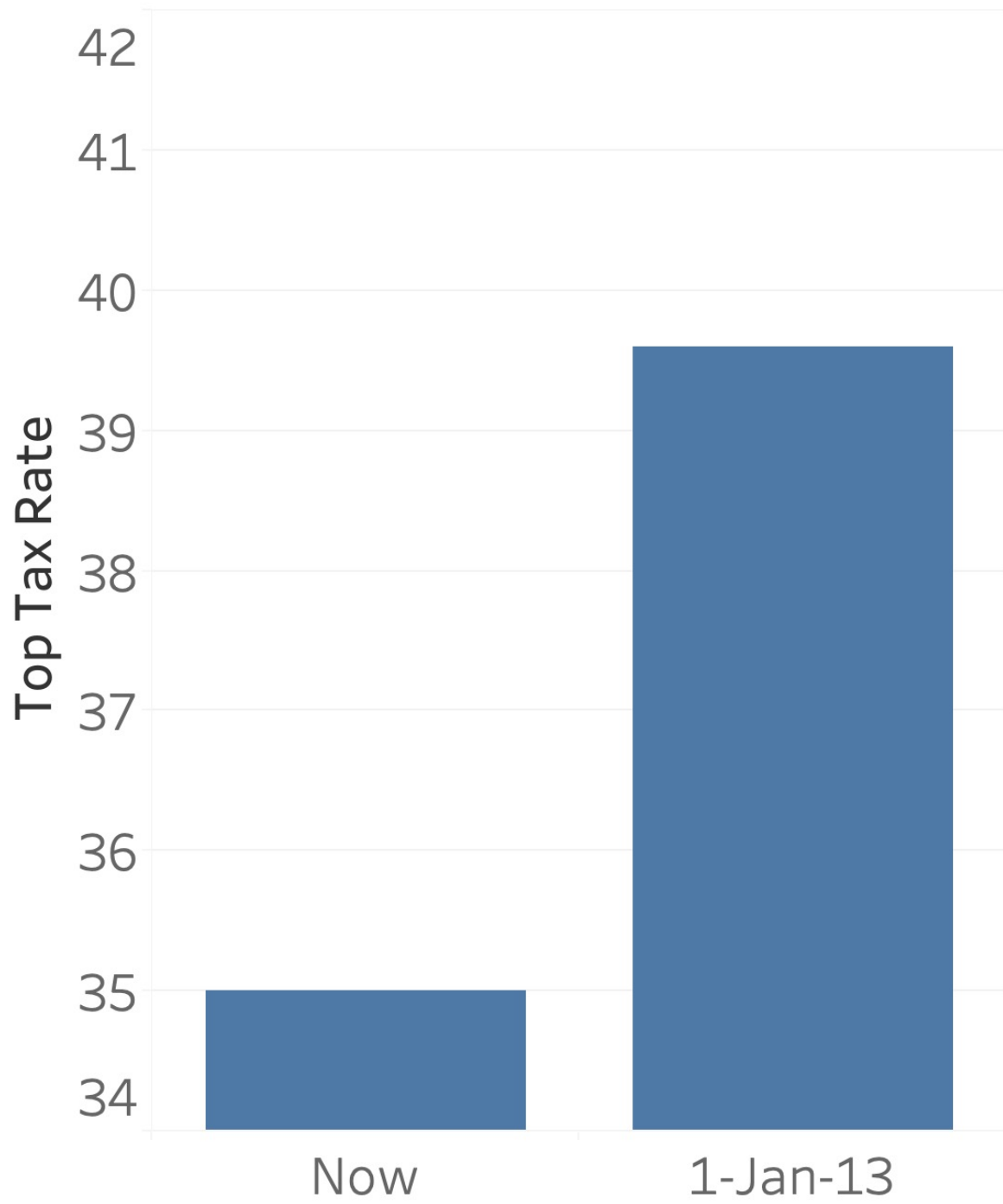
TOP TAX RATE



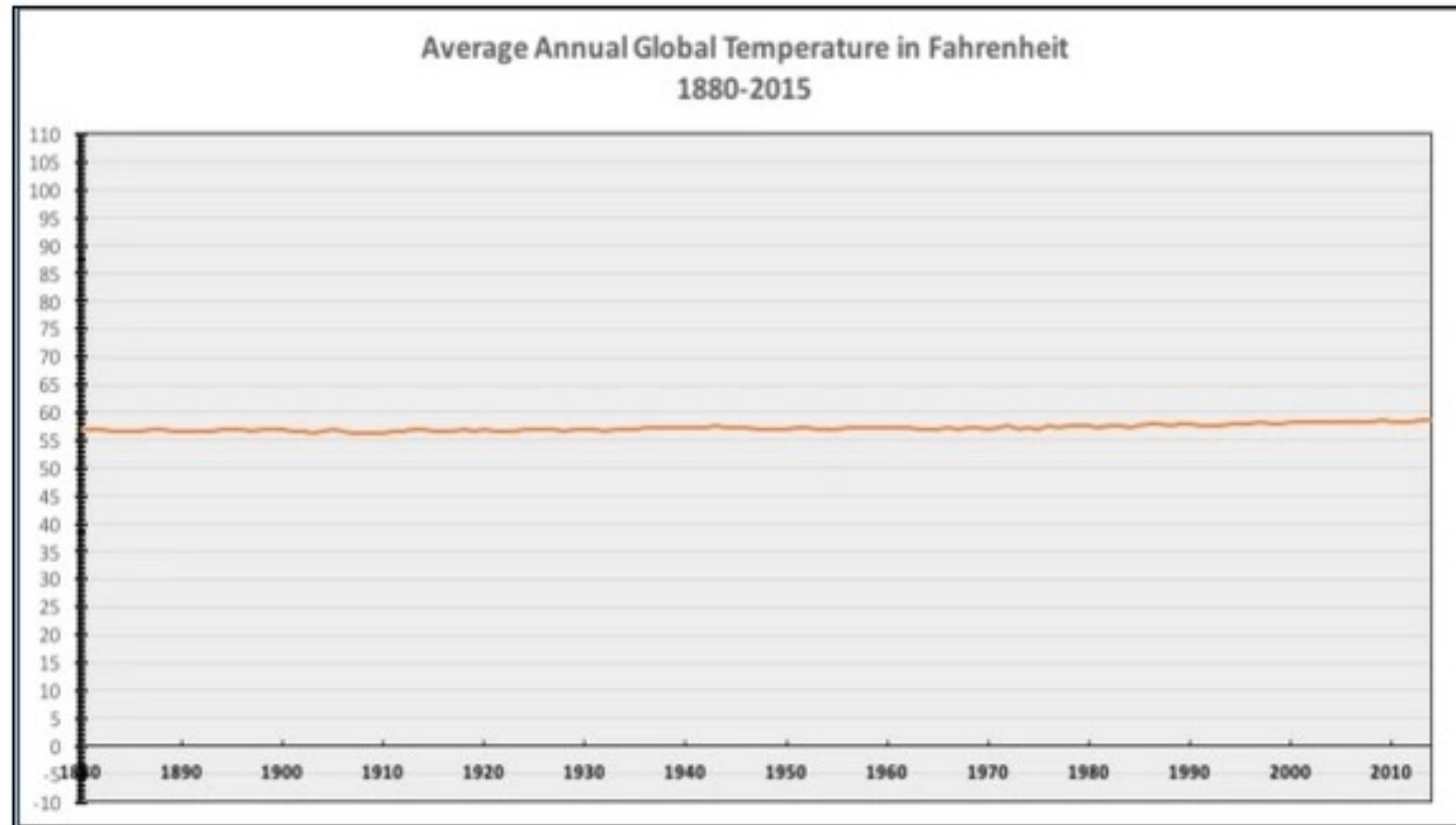
IF BUSH TAX CUTS EXPIRE

TOP TAX RATE





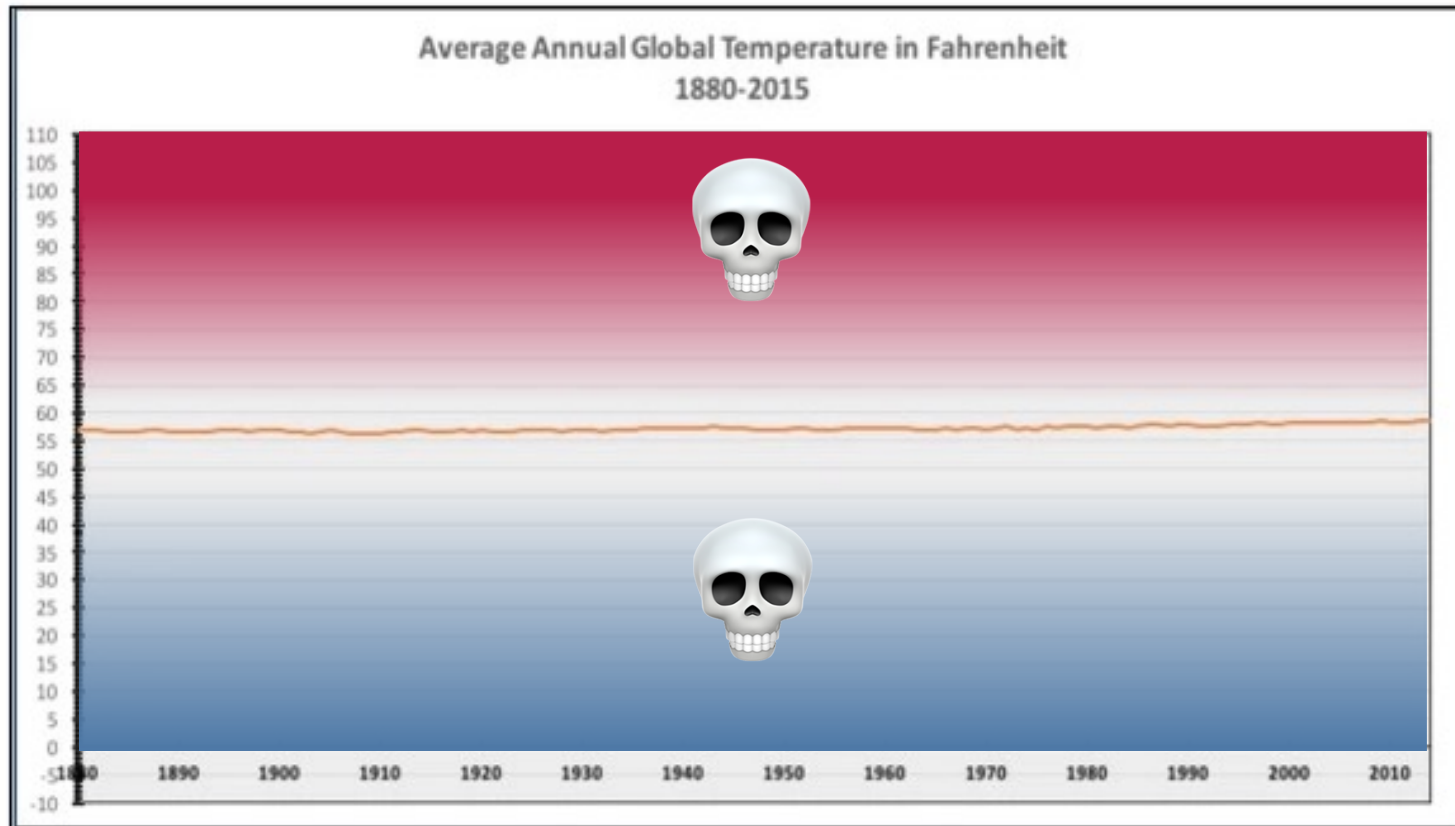
“The Only Climate Change Graph You’ll Ever Need”



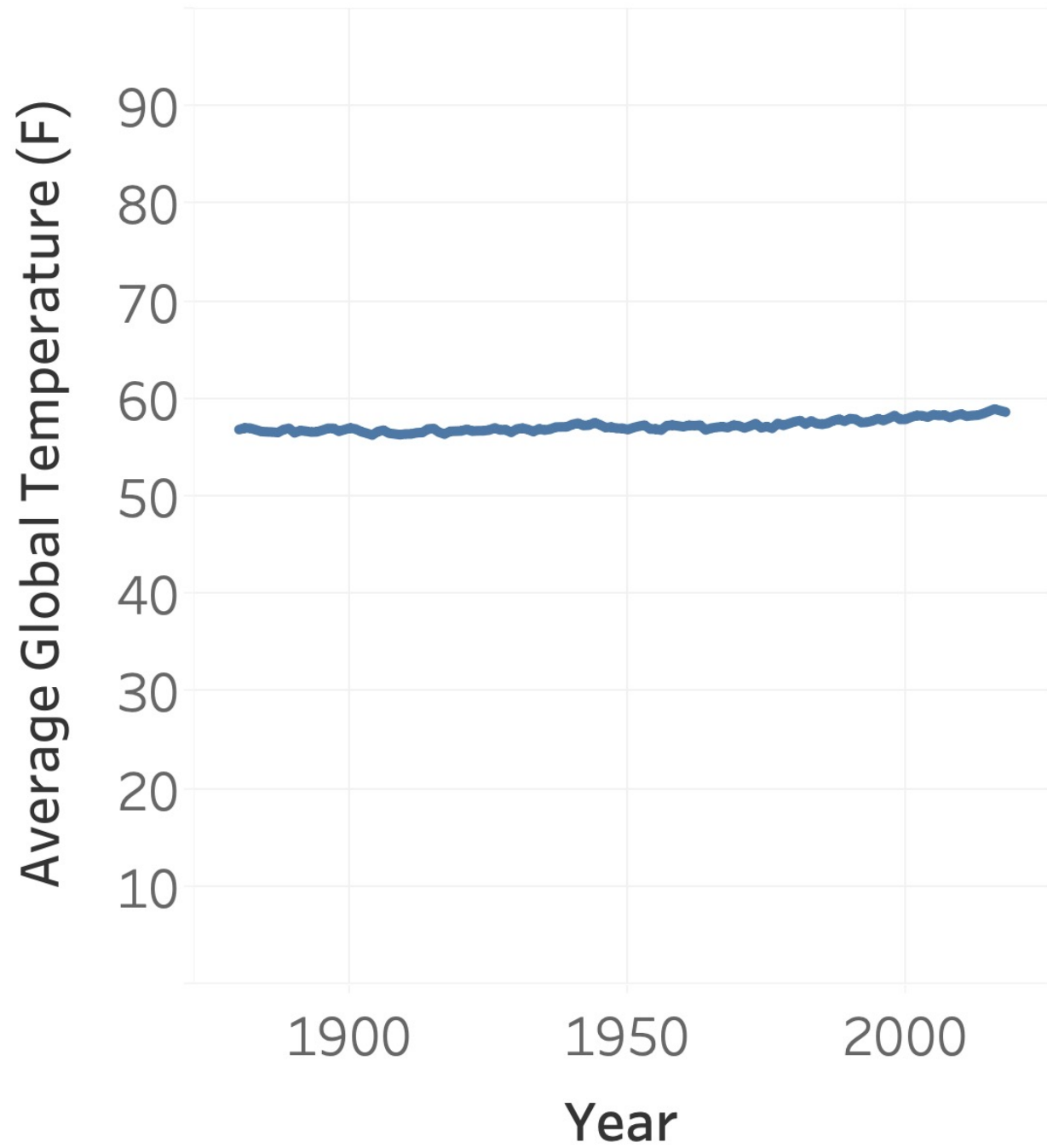
Average Annual Global Temperature in Fahrenheit 1880-2015



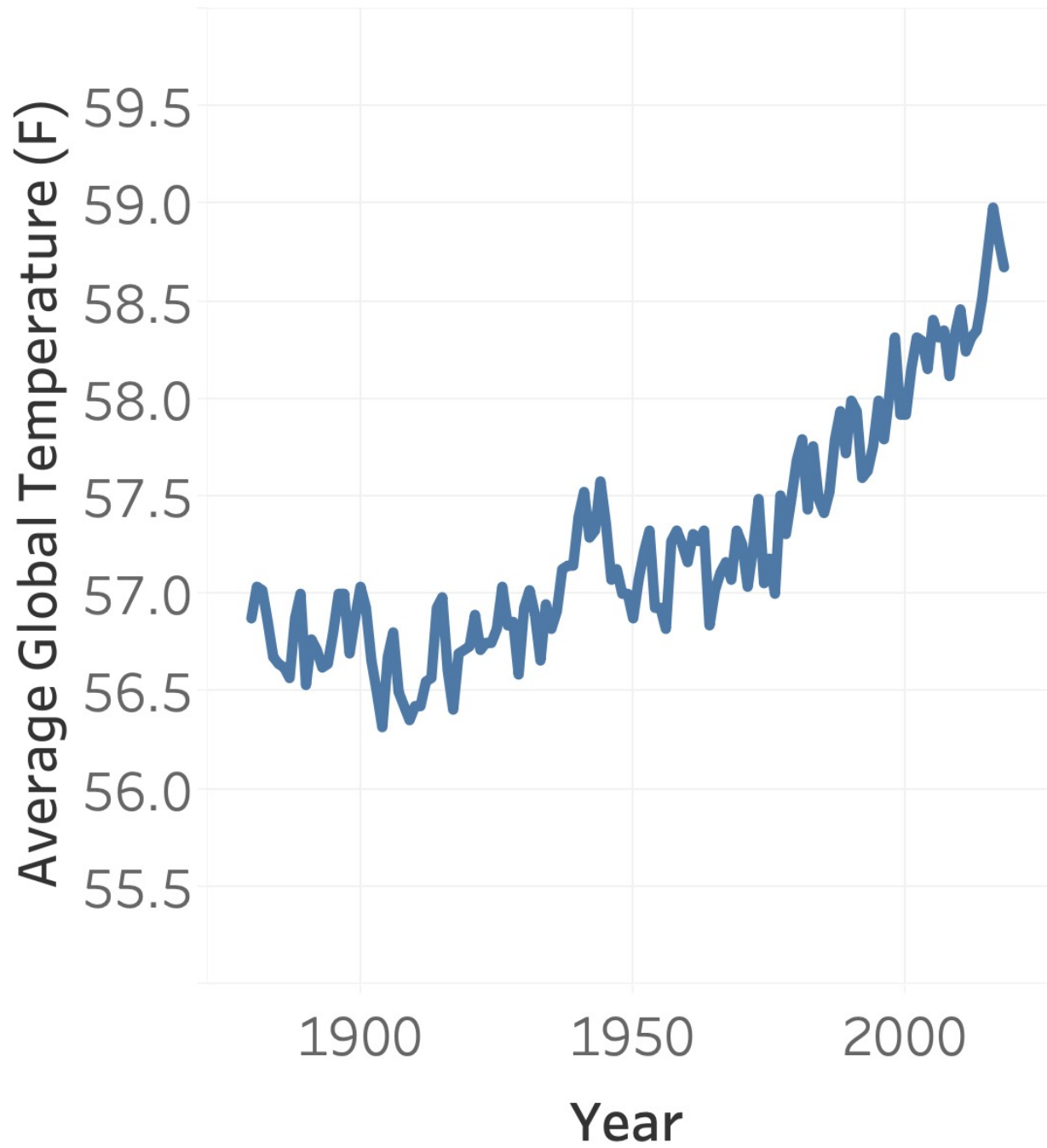
“The Only Climate Change Graph You’ll Ever Need”



NRO



NRO (Truncated)



Scale Manipulation

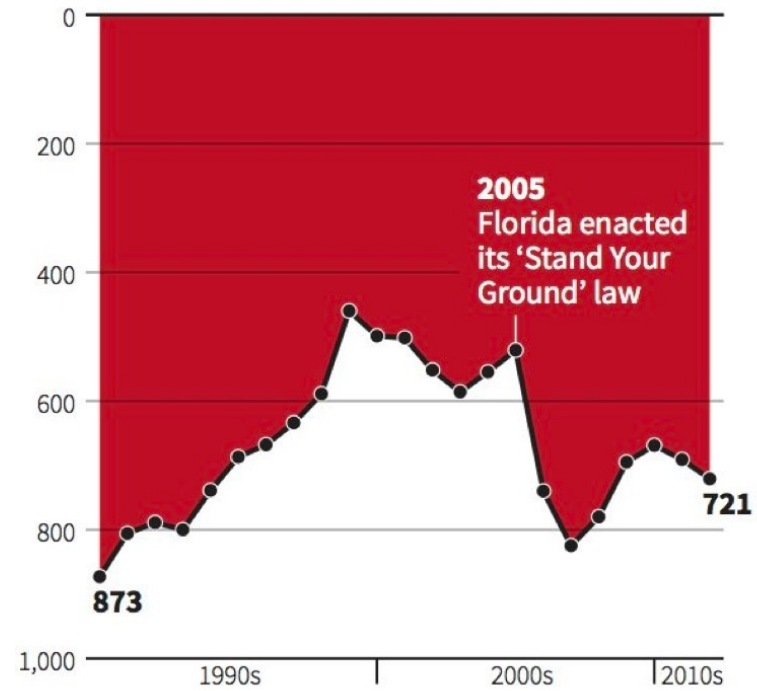
Changing with the scales of your chart to minimize, magnify, or invert the change in the data.

Convention Manipulation

Convention Manipulation

Gun deaths in Florida

Number of murders committed using firearms

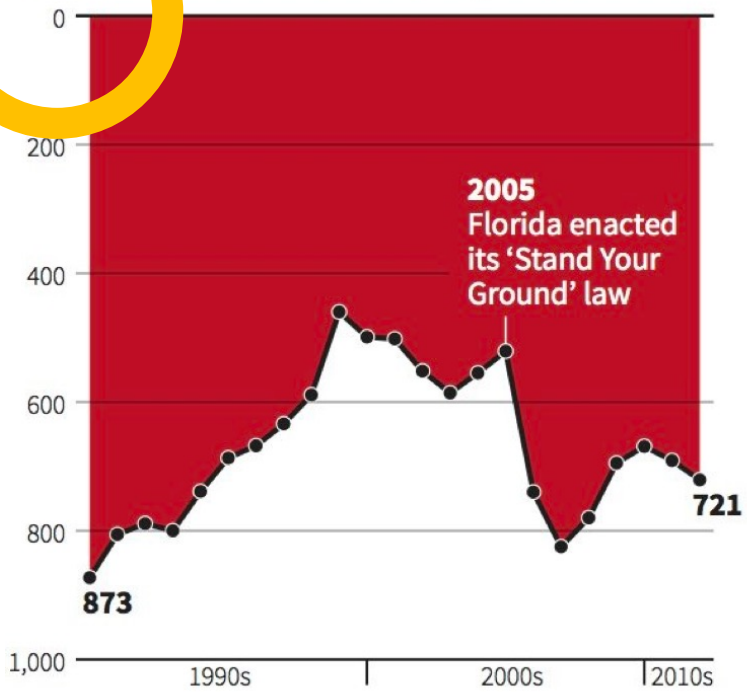


Source: Florida Department of Law Enforcement

Convention Manipulation

Gun deaths in Florida

Number of murders committed using firearms

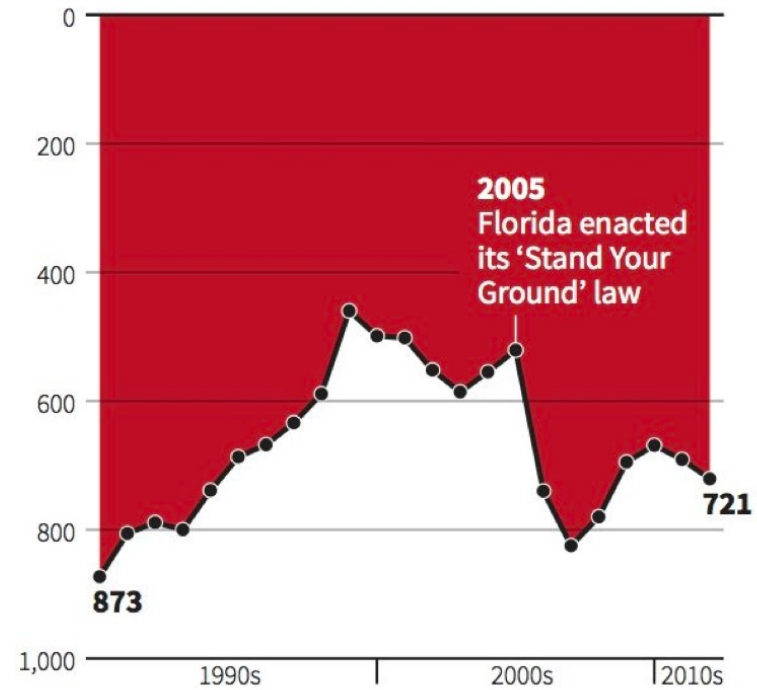


Source: Florida Department of Law Enforcement

Convention Manipulation

Gun deaths in Florida

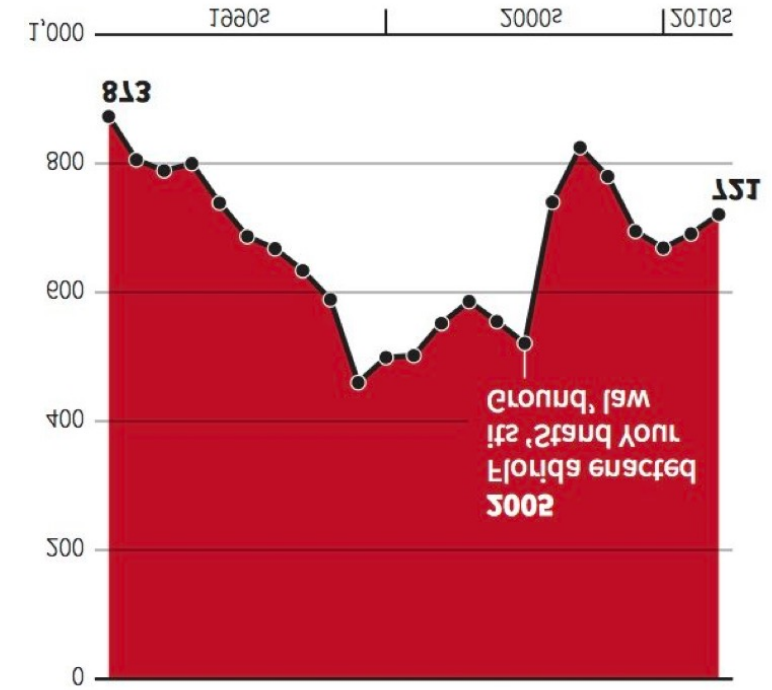
Number of murders committed using firearms



Source: Florida Department of Law Enforcement

Gun deaths in Florida

Number of murders committed using firearms

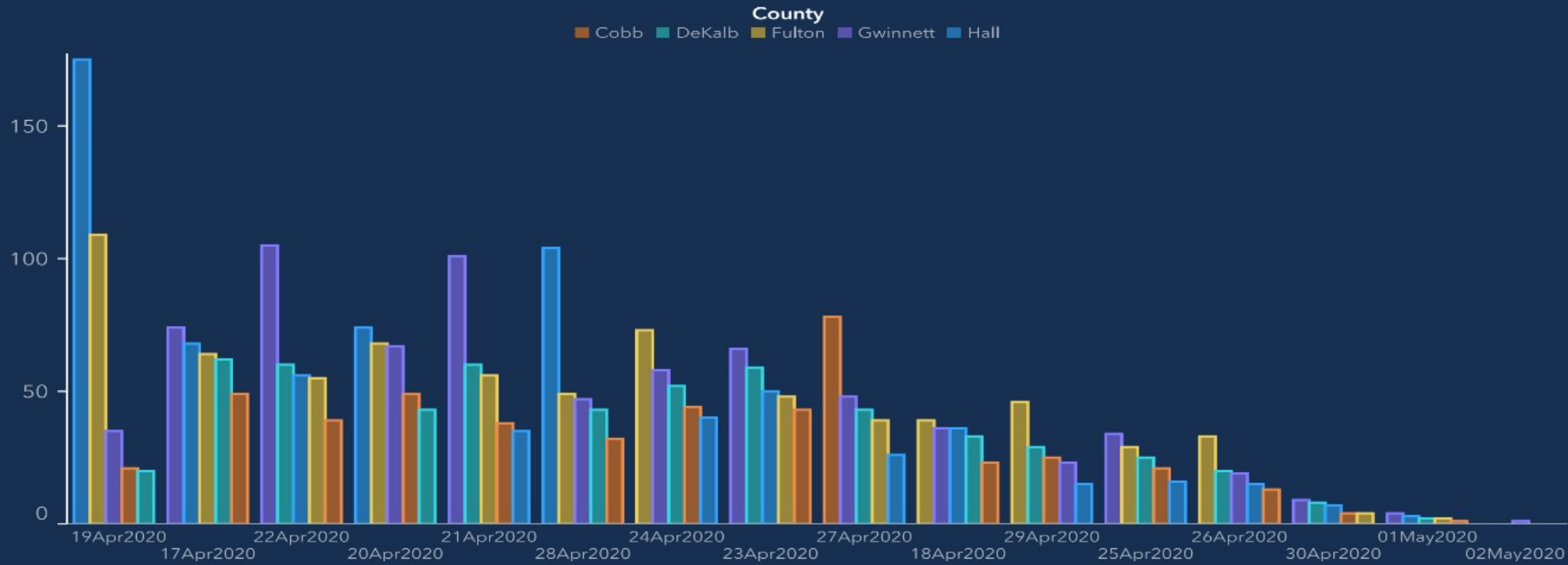


Source: Florida Department of Law Enforcement

Convention Manipulation

Top 5 Counties with the Greatest Number of Confirmed COVID-19 Cases

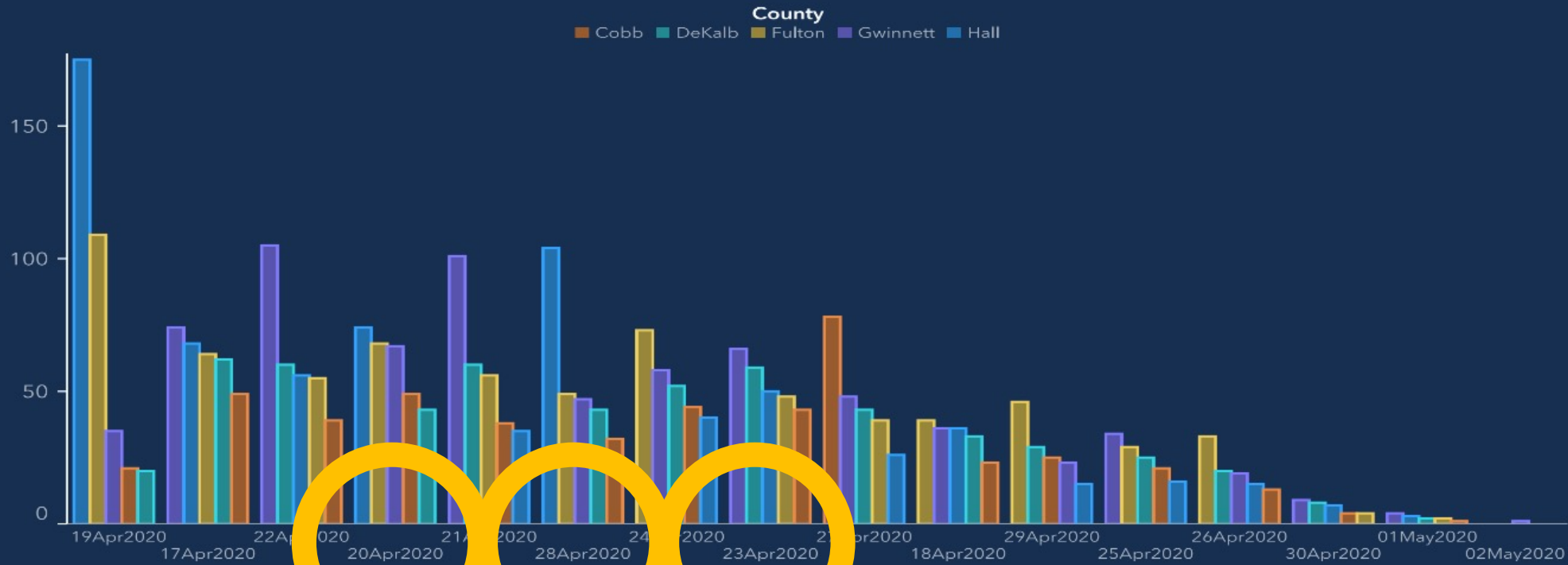
The chart below represents the most impacted counties over the past 15 days and the number of cases over time. The table below also represents the number of deaths and hospitalizations in each of those impacted counties.



Convention Manipulation

Top 5 Counties with the Greatest Number of Confirmed COVID-19 Cases

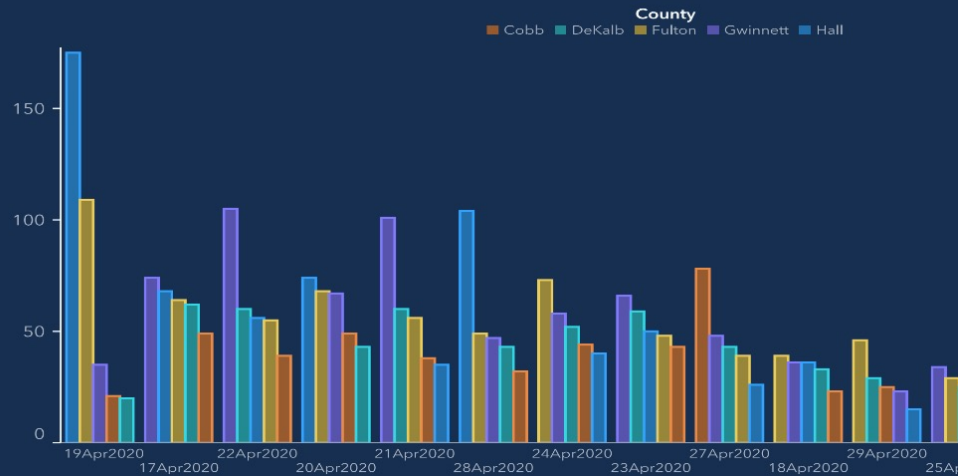
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Convention Manipulation

Top 5 Counties with the Greatest Number of Confirmed COVID-19 Cases

The chart below represents the most impacted counties over the past 15 days and the number of cases over time. The table below also represents the number of deaths and hospitalizations in each of those impacted counties.



Candice Broce

@candicebroce

Replying to @petecorson and @AJCInteractives

The x axis was set up that way to show descending values to more easily demonstrate peak values and counties on those dates. Our mission failed. We apologize. It is fixed.

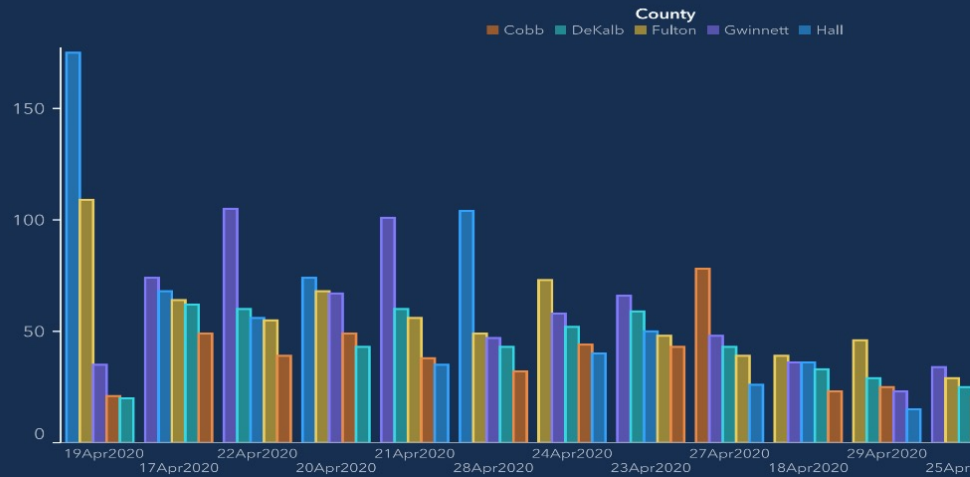
1:38 PM · May 11, 2020 · Twitter for iPhone

14 Retweets 50 Quote Tweets 28 Likes

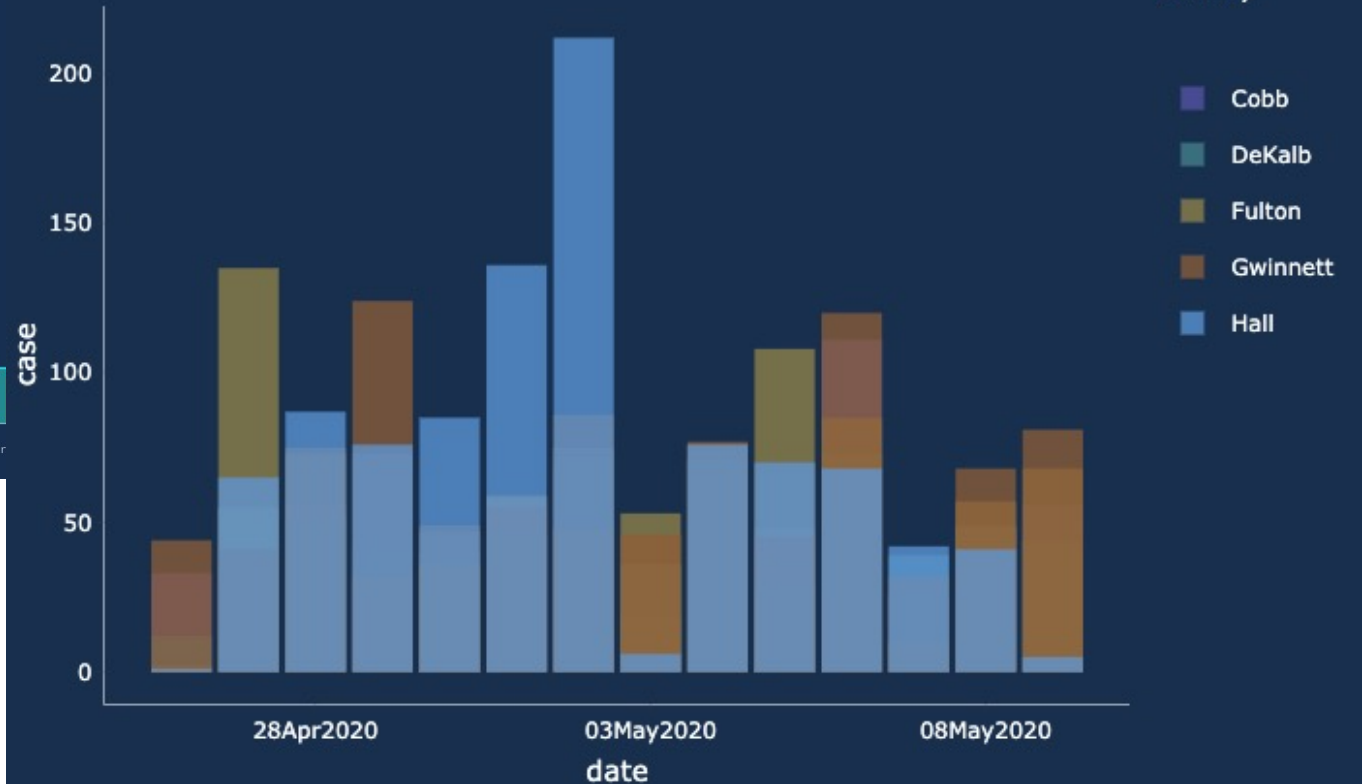
Convention Manipulation

Top 5 Counties with the Greatest Number of Confirmed COVID-19 Cases

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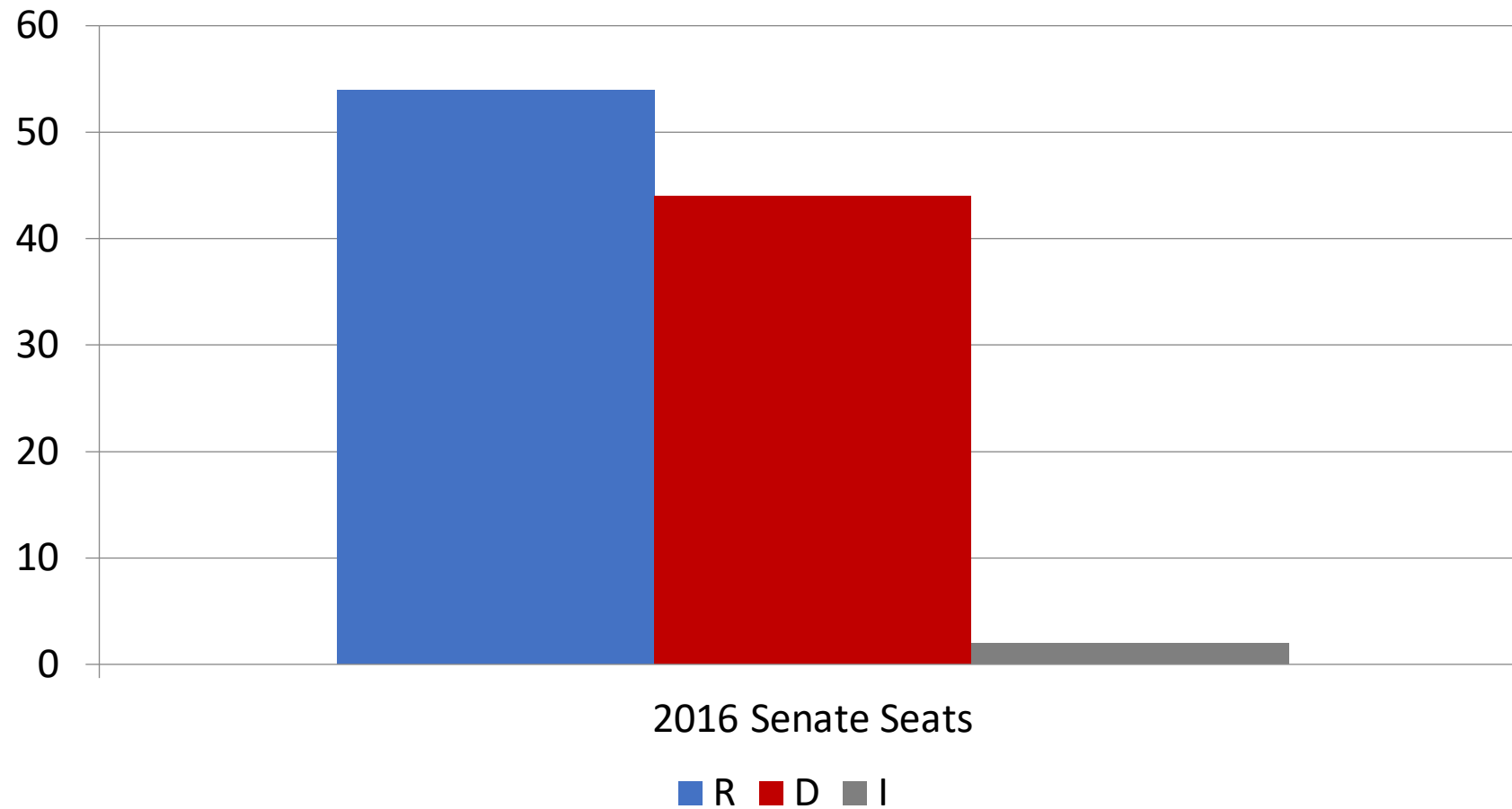
Top 5 Counties with the Greatest Number of Confirmed COVID-19 Cases



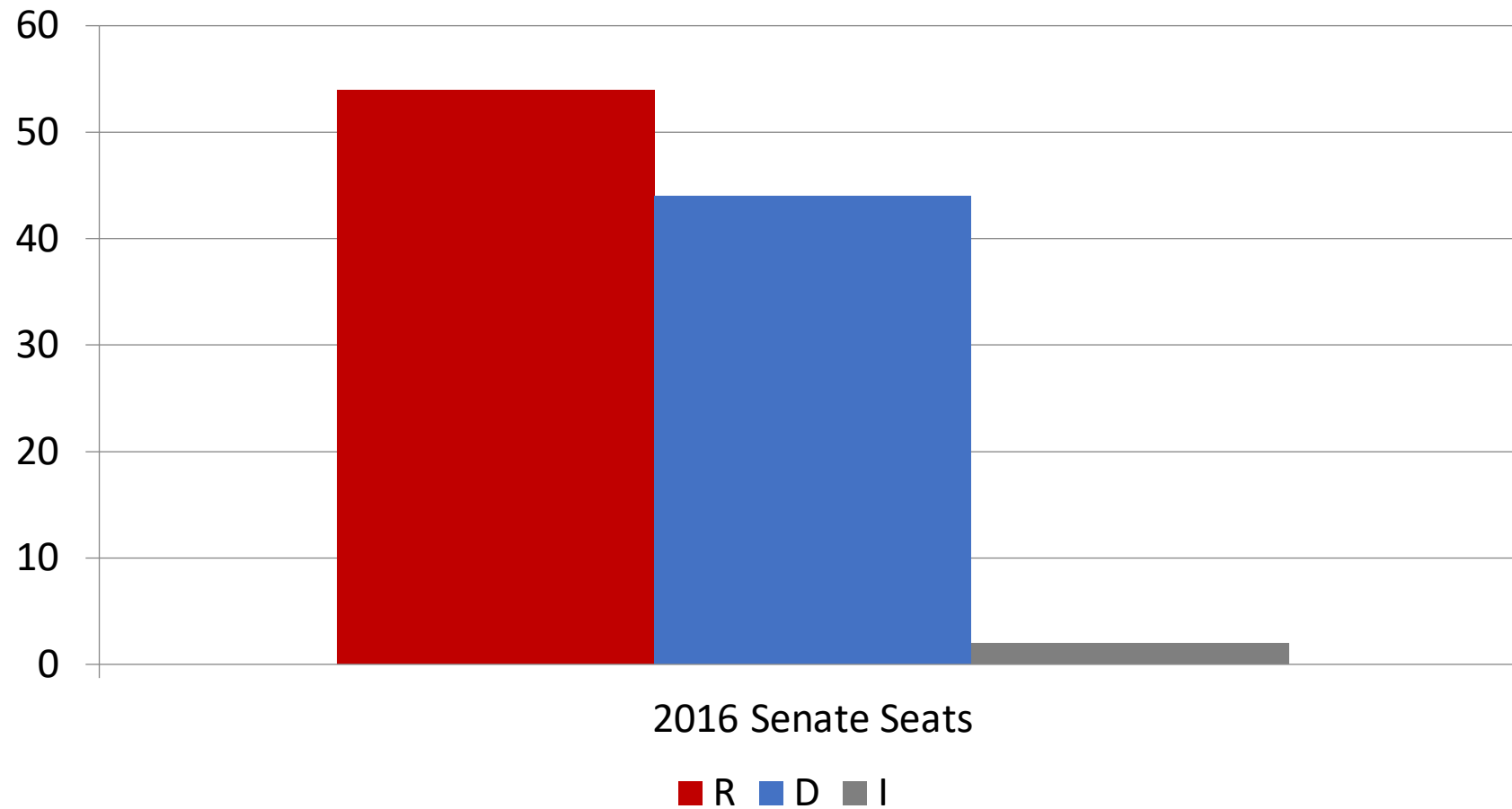
Redesign from Lucy D'Agostino McGowan

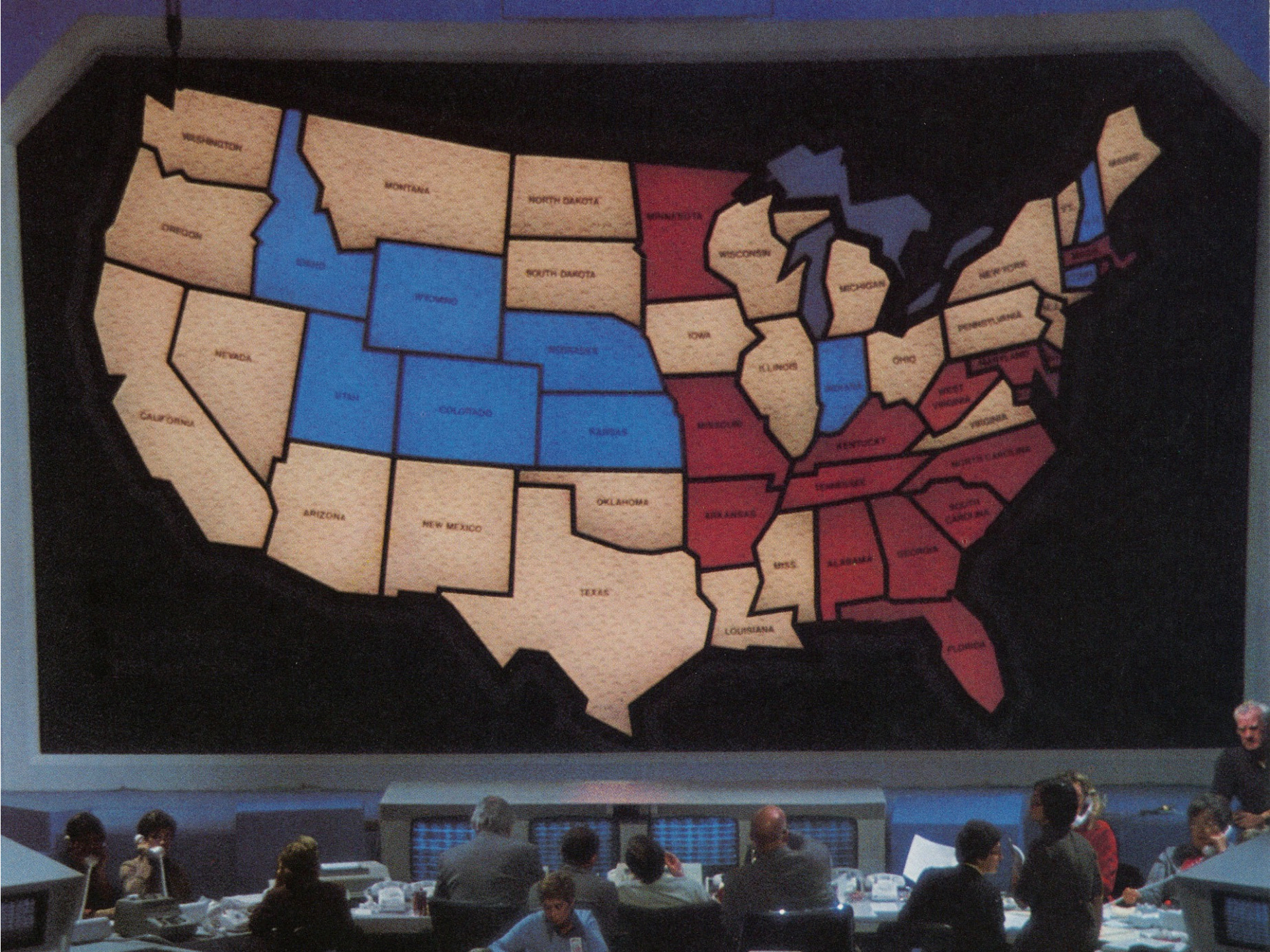
<https://livefreeordichotomize.com/2020/05/17/graph-detective/>

Convention Manipulation



Convention Manipulation





Wrap Up

The designer of a chart can control the **message** of the chart

There are **patterns** that can often result in misleading charts

But **critical thinking** is more important than hard rules in design

Questions

What Makes A Visualization *Deceptive*?

What Makes a Visualization *Ethical*?

Accounts of Ethics

Consequentialist Ethics

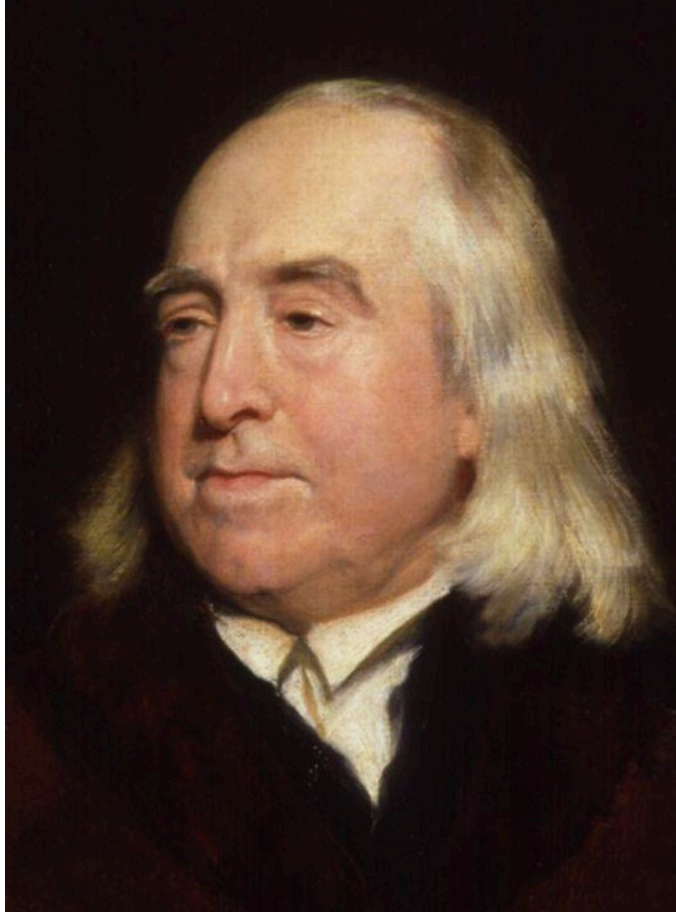
Deontological Ethics

Virtue Ethics

Role Ethics

... lots more

Consequentialism



A action is ethical or unethical based on its *consequences*. For instance, in “utilitarianism,” an action’s ethics is based on *utility*.

The Value of Visualization

- $C_i(S_0)$: *Initial development costs*. The visualization method has to be developed and implemented, possibly new hardware has to be acquired.
- $C_u(S_0)$: *Initial costs per user*. The user has to spend time on selection and acquisition of V , understanding how to use it, and tailoring it to his particular needs.
- $C_s(S_0)$: *Initial costs per session*. Data have to be converted, and an initial specification of the visualization has to be made.
- C_e : *Perception and exploration costs*. The user has to spend time to watch the visualization and understand it, as well as in modification and tuning of the specification, thereby exploring the data set.

The total costs are now given by

$$C = C_i + nC_u + nmC_s + nmkC_e.$$

The return on these investments consists of the value $W(\Delta K)$ of the acquired knowledge $\Delta K = K(T) - K(0)$ per session, multiplied by the total number of sessions:

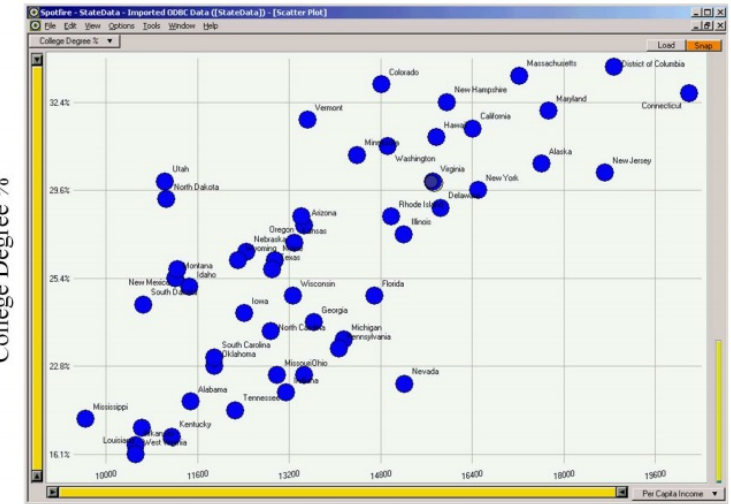
$$G = nmW(\Delta K)$$

and hence for the total profit $F = G - C$ we find

$$F = nm(W(\Delta K) - C_s - kC_e) - C_i - nC_u.$$

State	College Degree %	Per Capita Income
Alabama	20.6%	11486
Alaska	30.3%	17610
Arizona	27.1%	13461
Arkansas	17.0%	10520
California	31.3%	16409
Colorado	33.9%	14821
Connecticut	33.8%	20189
Delaware	27.9%	15854
District of Columbia	36.4%	18881
Florida	24.9%	14698
Georgia	24.3%	13631
Hawaii	31.2%	15770
Idaho	25.2%	11457
Illinois	26.8%	15201
Indiana	20.9%	13149
Iowa	24.5%	12422
Kansas	26.5%	13300
Kentucky	17.7%	11153
Louisiana	19.4%	10635
Maine	25.7%	12957
Maryland	31.7%	17730
Massachusetts	34.5%	17224
Michigan	24.1%	14154
Minnesota	30.4%	14389
Mississippi	19.9%	9648
Missouri	22.3%	12989
Montana	25.4%	11213
Nebraska	26.0%	12452
Nevada	21.5%	15214
New Hampshire	32.4%	15959
New Jersey	30.1%	18714
New Mexico	25.5%	11246
New York	29.5%	16501
North Carolina	24.2%	12885
North Dakota	28.1%	11051
Ohio	22.3%	13461
Oklahoma	22.8%	11893
Oregon	27.5%	13418
Pennsylvania	23.2%	14058
Rhode Island	27.5%	14981
South Carolina	23.0%	11897
South Dakota	24.6%	10661
Tennessee	20.1%	12285
Texas	25.5%	12904
Utah	30.0%	11029
Vermont	31.5%	13527
Virginia	30.0%	15719
Washington	30.9%	14923
West Virginia	16.1%	10520
Wisconsin	24.9%	13276
Wyoming	25.7%	12311

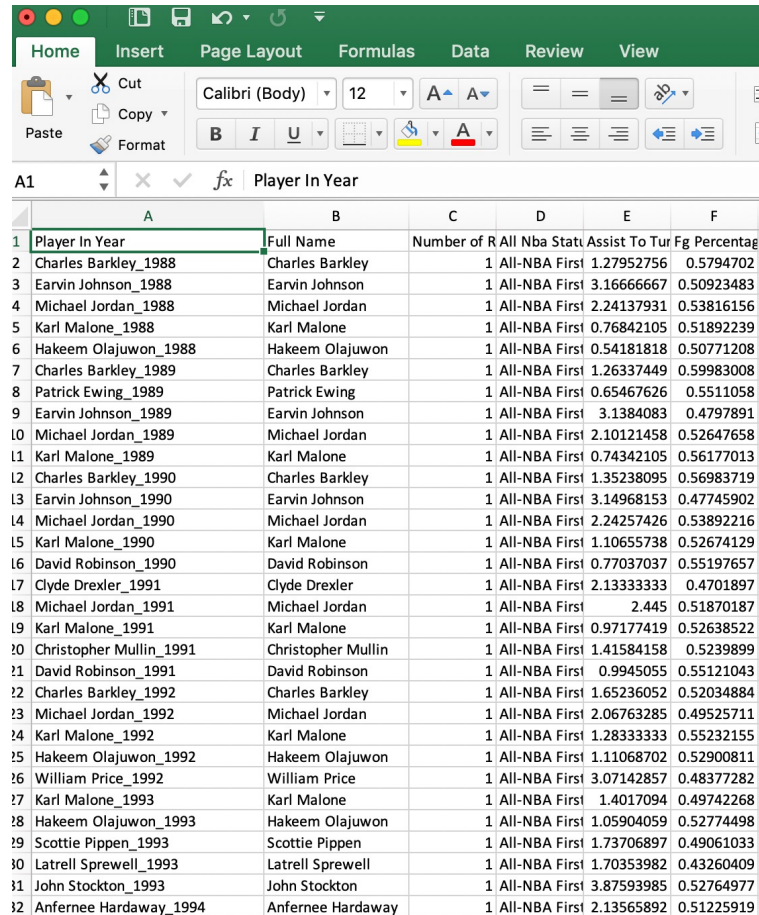
(a) A thousand words



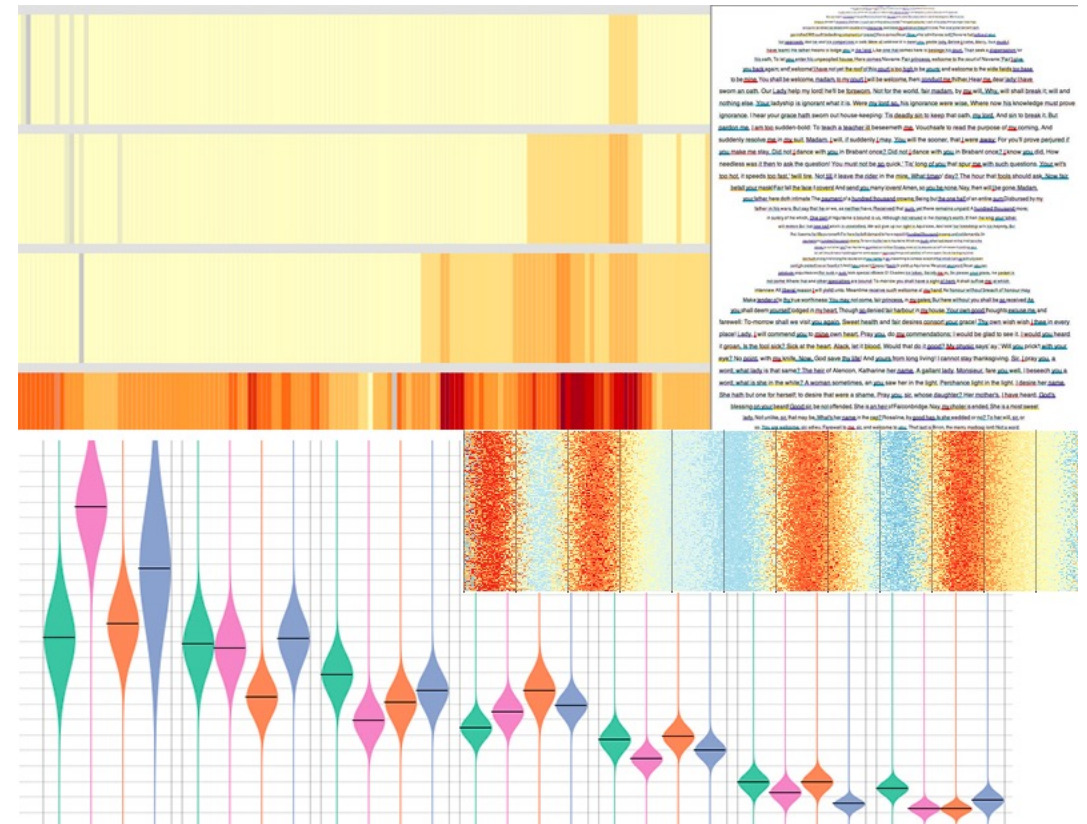
(b) A picture

Fig. 1: “A picture is worth a thousand words”

The Value of Visualization



Player In Year	Full Name	Number of R	All Nba	Stat	Assist	To Tur	Fg Percentage
Charles Barkley_1988	Charles Barkley	1	All-NBA	First	1.27952756	0.5794702	
Earvin Johnson_1988	Earvin Johnson	1	All-NBA	First	3.16666667	0.50923483	
Michael Jordan_1988	Michael Jordan	1	All-NBA	First	2.24137931	0.53816156	
Karl Malone_1988	Karl Malone	1	All-NBA	First	0.76842105	0.51892239	
Hakeem Olajuwon_1988	Hakeem Olajuwon	1	All-NBA	First	0.54181818	0.50771208	
Charles Barkley_1989	Charles Barkley	1	All-NBA	First	1.26337449	0.59983008	
Patrick Ewing_1989	Patrick Ewing	1	All-NBA	First	0.65467626	0.5511058	
Earvin Johnson_1989	Earvin Johnson	1	All-NBA	First	3.13840883	0.4797891	
Michael Jordan_1989	Michael Jordan	1	All-NBA	First	2.10121458	0.52647658	
Karl Malone_1989	Karl Malone	1	All-NBA	First	0.74342105	0.56177013	
Charles Barkley_1990	Charles Barkley	1	All-NBA	First	1.35238095	0.56983719	
Earvin Johnson_1990	Earvin Johnson	1	All-NBA	First	3.14968153	0.47745902	
Michael Jordan_1990	Michael Jordan	1	All-NBA	First	2.24257426	0.53892216	
Karl Malone_1990	Karl Malone	1	All-NBA	First	1.10655738	0.52674129	
David Robinson_1990	David Robinson	1	All-NBA	First	0.77037037	0.55197657	
Clyde Drexler_1991	Clyde Drexler	1	All-NBA	First	2.13333333	0.4701897	
Michael Jordan_1991	Michael Jordan	1	All-NBA	First	2.445	0.51870187	
Karl Malone_1991	Karl Malone	1	All-NBA	First	0.97177419	0.52638522	
Christopher Mullin_1991	Christopher Mullin	1	All-NBA	First	1.41584158	0.5239899	
David Robinson_1991	David Robinson	1	All-NBA	First	0.9945055	0.55121043	
Charles Barkley_1992	Charles Barkley	1	All-NBA	First	1.65236052	0.52034884	
Michael Jordan_1992	Michael Jordan	1	All-NBA	First	2.06763285	0.49525711	
Karl Malone_1992	Karl Malone	1	All-NBA	First	1.28333333	0.55232155	
Hakeem Olajuwon_1992	Hakeem Olajuwon	1	All-NBA	First	1.11068702	0.52900811	
William Price_1992	William Price	1	All-NBA	First	3.07142857	0.48377282	
Karl Malone_1993	Karl Malone	1	All-NBA	First	1.4017094	0.49742268	
Hakeem Olajuwon_1993	Hakeem Olajuwon	1	All-NBA	First	1.05904059	0.52774498	
Scottie Pippen_1993	Scottie Pippen	1	All-NBA	First	1.73706897	0.49061033	
Latrell Sprewell_1993	Latrell Sprewell	1	All-NBA	First	1.70353982	0.43260409	
John Stockton_1993	John Stockton	1	All-NBA	First	3.87593985	0.52764977	
Anfernee Hardaway_1994	Anfernee Hardaway	1	All-NBA	First	2.13565892	0.51225919	

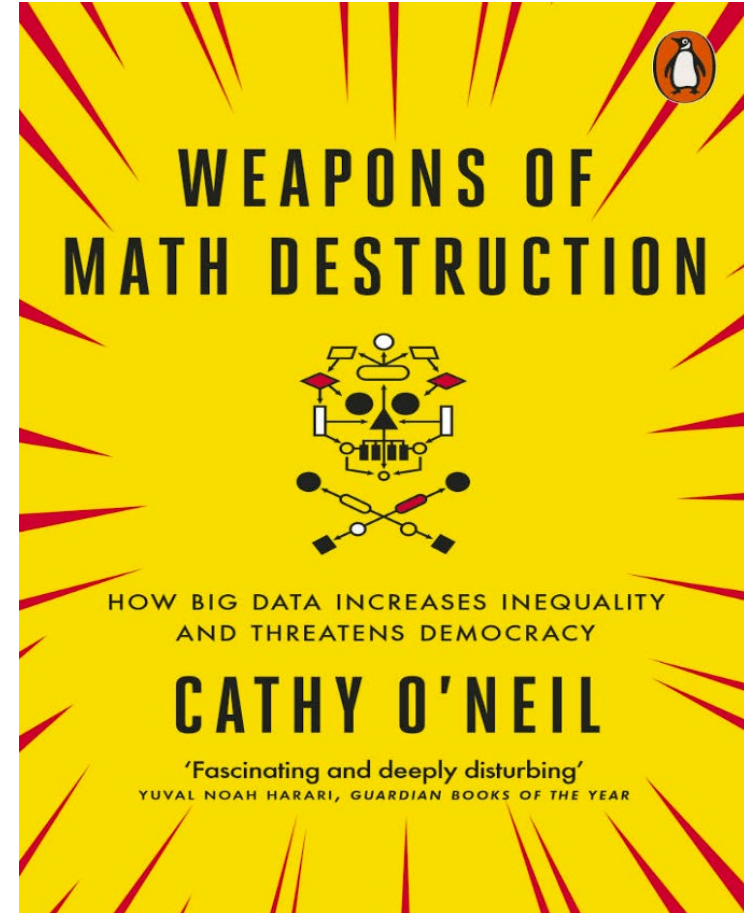


Problems with consequentialism

What do we measure?

Who is doing the measuring?

When are we done measuring?



Deontological Ethics



An action is ethical or unethical based on whether or not it follows the *rules*.

Visualization “Rules”

Tufte’s Lie Factor

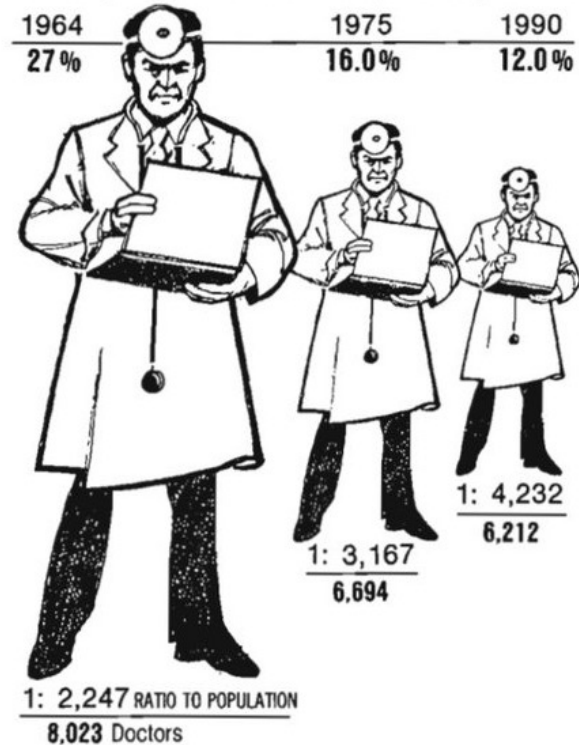
LF = size of effect shown in graphic / size of effect in data

”Dishonest” if $LF \neq 1$

THE SHRINKING FAMILY DOCTOR In California

Percentage of Doctors Devoted Solely to Family Practice

1964	1975	1990
27%	16.0%	12.0%



Visualization “Rules”

Tufte’s Lie Factor

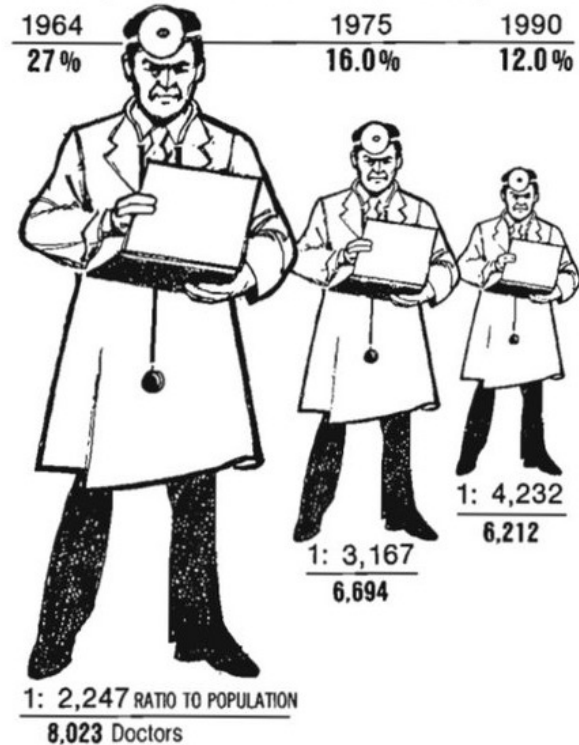
LF = size of effect shown in graphic / size of effect in data

LF = 2.8!

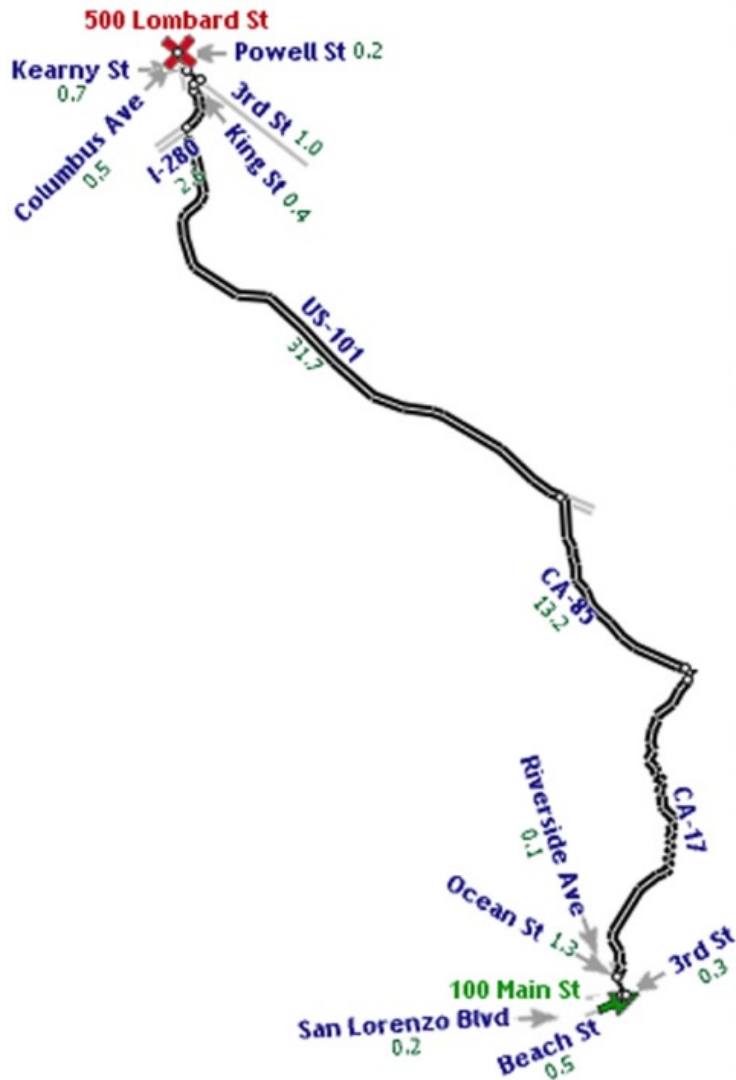
THE SHRINKING FAMILY DOCTOR In California

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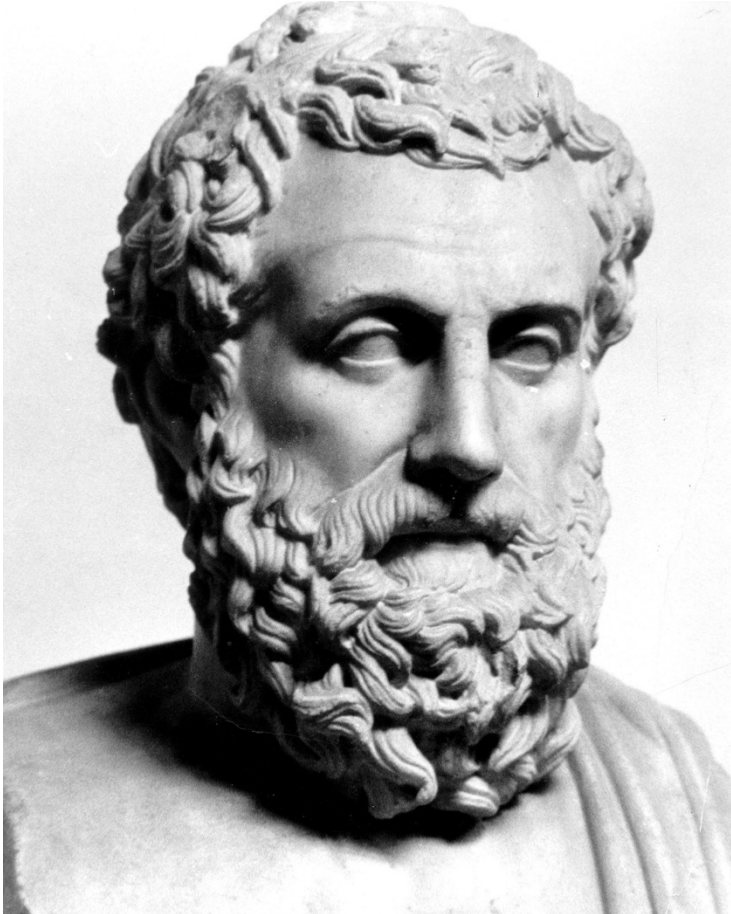
1964	1975	1990
27%	16.0%	12.0%



Visualization “White Lies”



Virtue Ethics



Your actions are assessed by
the extent to which they
cultivate your virtues

Critical InfoVis: Exploring the Politics of Visualization

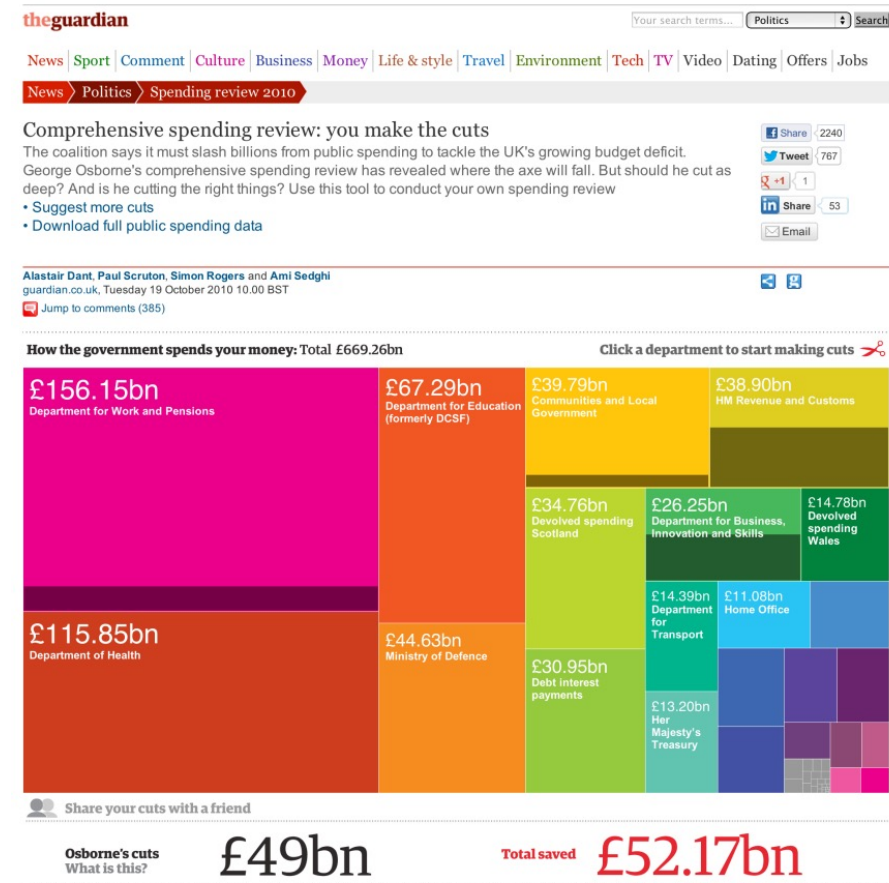
Disclosure

Plurality

Contingency

Empowerment

-Marian Dörk, Patrick Feng,
Chris Collins, Sheelagh
Carpendale

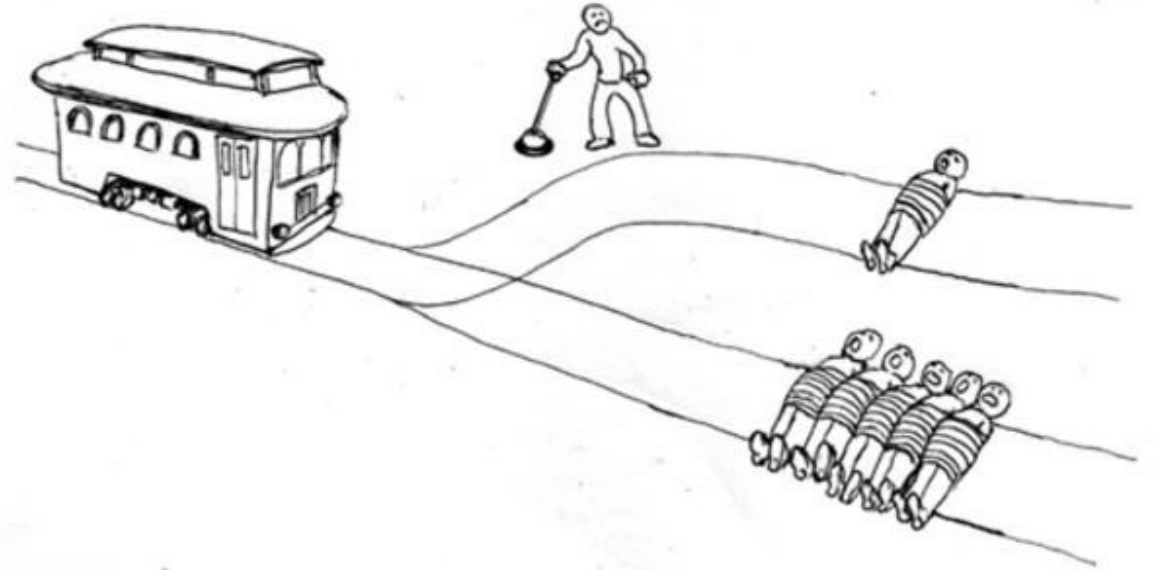


Problems with virtue ethics

Where do the virtues come from?

What do I do about conflicts in virtues?

What is never okay to do?



Role Ethics



Your actions are assessed by the extent to which you *fulfill the obligations* of your role.

Professional Ethics

ACM CODE OF ETHICS

Computing professionals' actions **CHANGE THE WORLD**.
They should reflect upon the wider impact of their work,
consistently supporting the public good.

GENERAL ETHICAL PRINCIPLES.

Contribute to society and to human well-being, acknowledging that all people are stakeholders in computing. Avoid harm. Be honest and trustworthy. Be fair and take action not to discriminate. Respect the work required to produce new ideas, inventions, and creative works, and computing artifacts. Respect privacy. Honor confidentiality.

PROFESSIONAL RESPONSIBILITIES.

Strive to achieve **high quality** in both the processes and products of professional work. Maintain **high standards** of professional competence, conduct, and ethical practice. Know and **respect existing rules** pertaining to professional work. Accept and provide appropriate **professional review**. Give **comprehensive and thorough evaluations** of computer systems and their impacts, including analysis of possible risks. Perform **work only in areas of competence**. Foster **public awareness and understanding** of computing, related technologies, and their consequences. Access computing and communication resources only when authorized or when compelled by the public good. Design and implement systems that are **robustly and useably secure**.

PROFESSIONAL LEADERSHIP PRINCIPLES.

Ensure that the public good is the central concern during all professional computing work. Articulate, encourage acceptance of, and evaluate fulfillment of **social responsibilities** by members of the organization or group. Manage personnel and resources to **enhance the quality of working life**. Articulate, apply, and support policies and processes that **reflect the principles of the Code**. Create opportunities for members of the organization or group to **grow as professionals**. Use **care** when modifying or retiring systems. Recognize and take special care of systems that become integrated in the infrastructure of society.

<https://www.acm.org/code-of-ethics>



The image shows a document titled "Society of Professional Journalists CODE of ETHICS". The document is framed in a blue border and contains several sections of text and lists of principles. The title "CODE of ETHICS" is prominently displayed in large, bold, blue letters. Below the title, there is a "PREAMBLE" section, followed by "SEEK TRUTH AND REPORT IT", "ACT INDEPENDENTLY", "BE ACCOUNTABLE AND TRANSPARENT", and "MINIMIZE HARM". Each section contains specific guidelines and lists of actions for journalists. The document is presented as a scan of a printed page.

Society of Professional Journalists
CODE of ETHICS

PREAMBLE
Members of the Society of Professional Journalists believe that public enlightenment is the forerunner of justice and the foundation of democracy. Ethical journalism strives to ensure the free exchange of information that is accurate, fair and thorough. An ethical journalist acts with integrity. The Society declares these four principles on the foundation of ethical journalism and encourages their use in its practice by all people in all media.

SEEK TRUTH AND REPORT IT
Ethical journalists should be accurate and fair. Journalists should be honest and courageous in gathering, reporting and interpreting information.
Journalists should:
• Take responsibility for the accuracy of their work. Verify information before releasing it. Use original sources whenever possible.
• Remember that neither speed nor format excuses inaccuracy.
• Provide context. Take special care not to misrepresent or oversimplify in promoting, previewing or summarizing a story.
• Gather, update and correct information throughout the life of a news story.
• Be cautious when making promises, but keep the promises they make.
• Identify sources clearly. The public is entitled to as much information as possible to judge the reliability and motivations of sources.
• Consider sources' motives before promising anonymity. Reserve anonymity for sources who may face danger, retribution or other harm, and have information that cannot be obtained elsewhere. Explain why anonymity was granted.
• Diligently seek subjects of news coverage to allow them to respond to criticism or allegations of wrongdoing.
• Avoid undercover or other surreptitious methods of gathering information unless traditional, open methods will not yield information vital to the public.
• Be vigilant and courageous about holding those with power accountable. Give voice to the voiceless.
• Support the open and civil exchange of views, even views they find repugnant.
• Recognize a special obligation to serve as watchdogs over public affairs and government. Seek to ensure that the public's business is conducted in the open, and that public records are open to all.
• Provide access to source material when it is relevant and appropriate.
• Boldly tell the story of the diversity and magnitude of the human experience. Seek sources whose voices we seldom hear.
• Avoid stereotyping. Journalists should examine the ways their values and experiences may shape their reporting.
• Label advocacy and commentary.
• Never deliberately distort facts or context, including visual information. Clearly label illustrations and re-enactments.
• Never plagiarize. Always attribute.

MINIMIZE HARM
Ethical journalists treatate newsworthy, subjects, colleagues and members of the public as human beings deserving of respect.
Journalists should:
• Balance the public's need for information against potential harm or discomfort. Pursuit of the news is not a license for arrogance or undue intrusiveness.

• Show compassion for those who may be affected by news coverage. Use heightened sensitivity when dealing with juveniles, victims of sex crimes, and sources or subjects who are inexperienced or unable to give consent. Consider cultural differences in approach and treatment.
• Recognize that legal access to information differs from an ethical justification to publish or broadcast.
• Realize that private people have a greater right to control information about themselves than public figures and others who seek power, influence or attention. Weigh the consequences of publishing or broadcasting personal information.
• Avoid pandering to lurid curiosity, even if others do.
• Balance a suspect's right to a fair trial with the public's right to know. Consider the implications of identifying central suspects before they face legal charges.
• Consider the long-term implications of the extended reach and permanence of publication. Provide updated and more complete information as appropriate.

ACT INDEPENDENTLY
The highest and primary obligation of ethical journalism is to serve the public.
Journalists should:
• Avoid conflicts of interest, real or perceived. Disclose unavoidable conflicts.
• Refuse gifts, favors, fees, free travel and special treatment, and avoid political and other outside activities that may compromise integrity or impartiality, or may damage credibility.
• Be wary of sources offering information for favors or money; do not pay for access to news. Identify content provided by outside sources, whether paid or not.
• Deny favored treatment to advertisers, donors or any other special interests, and resist internal and external pressure to influence coverage.
• Clarify news from advertising and other hybrids that blur the line between the two. Prominently label sponsored content.

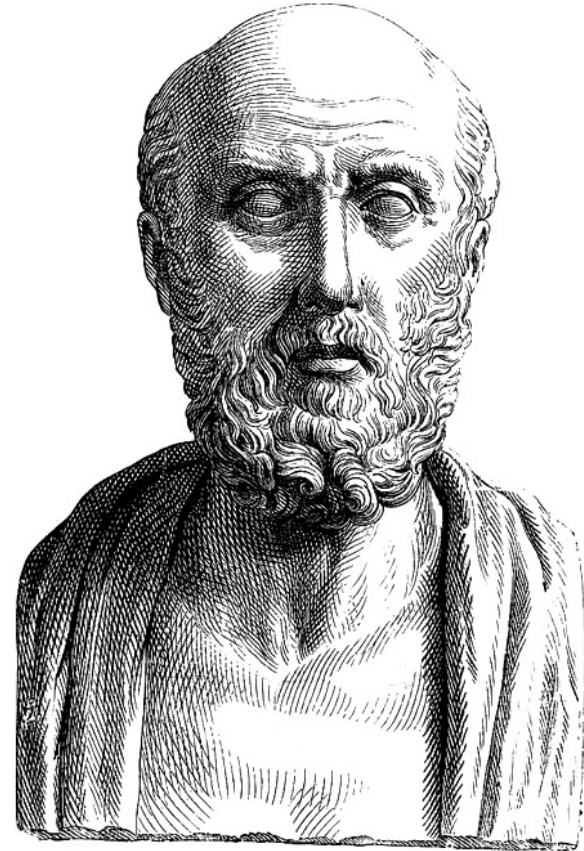
BE ACCOUNTABLE AND TRANSPARENT
Ethical journalists assume taking responsibility for one's work and explaining one's decisions to the public.
Journalists should:
• Explain ethical choices and processes to audiences. Encourage a civil dialogue with the public about journalistic practices, coverage and news content.
• Respond quickly to questions about accuracy, clarity and fairness.
• Acknowledge mistakes and correct them promptly and prominently. Explain corrections and clarifications carefully and clearly.
• Expose unethical conduct in journalism, including within their organizations.
• Abide by the same high standards they expect of others.

The SPJ Code of Ethics is a statement of guiding principles supported by additional explanations and position papers (at www.spj.org) that address changing journalistic practices. It is not a set of rules, rather a guide that encourages all who engage in journalism to take responsibility for the information they provide, regardless of media. The code should be read as a whole; individual principles should not be taken out of context. It is not, nor can it be under the First Amendment, legally enforceable.

Visualization Hippocratic Oath?

“ I shall not use visualization to intentionally hide or confuse the truth which it is intended to portray. I will respect the great power visualization has in garnering wisdom and misleading the uninformed. I accept this responsibility willfully and without reservation, and promise to defend this oath against all enemies, both domestic and foreign.”

-Jason Moore

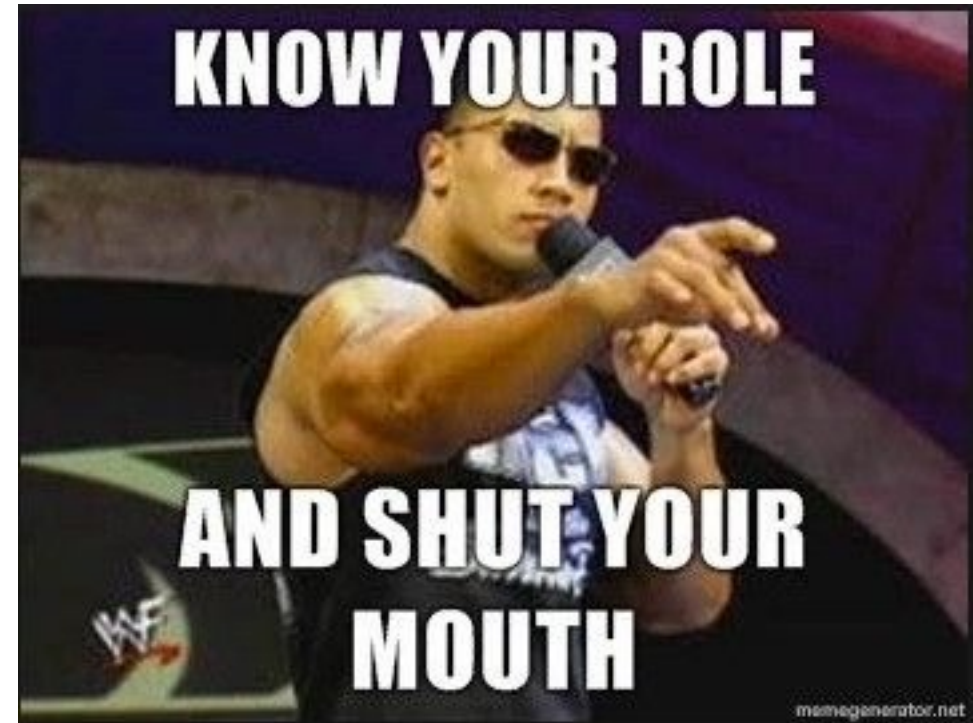


Problems with role-based ethics

Who gives you your roles?

What happens if you have multiple roles?

How big do our roles get?



Accounts of Ethics

Consequentialist Ethics

Deontological Ethics

Virtue Ethics

Role Based Ethics

... lots more

Berkeley/Haas Ethics Questions

Would I be happy for this decision to be on the public record?

What would happen if everybody did this?

How would I like it if someone did this to me?

Will the proposed course of action bring about a good result?

What will the proposed course of action do to my character or the character of my organization?

Is the proposed course of action consistent with my espoused values and principles?

What's a "Good" Visualization?

One that has the most *benefits* for the least *cost*

One that follows the *rules* of *good design*

One that *cultivates* the right *virtues*

One that *fulfills* our *duties* as visualization designers

Manifestos

" I SWEAR TO SUBMIT TO THE FOLLOWING SET OF RULES DRAWN UP AND CONFIRMED BY DOGME 95:

- 1 LOCATION**
PROPS AND SETS MUST NOT BE BROUGHT IN IF A PARTICULAR PROP IS NECESSARY FOR THE STORY, A LOCATION MUST BE CHOSEN WHEN THE PROP IS TO BE FILMED.
- 2 NEVER** (MUSIC MUST NOT BE USED BE PRODUCED APART FROM THE IMAGES OR VICE VERSA UNLESS IT OCCURS WITHIN THE SCENE BEING FILMED)
- 3 HAND-HELD CAMERA. ANY MOVEMENT OR IMMOBILITY ATTAINABLE IN THE HAND IS PERMITTED**
(THE FILM MUST NOT TAKE PLACE WHERE THE CAMERA IS STANDING; FILMING MUST TAKE PLACE WHERE THE ACTION TAKES PLACE.)
- 4 COLOUR.**
SPECIAL LIGHTING IS NOT ACCEPTABLE. IF THERE IS TOO LITTLE LIGHT FOR EXPOSURE THE SCENE MUST BE CUT OR A SINGLE LAMP BE ATTACHED TO THE CAMERA.
- 5 FORBIDDEN.**
OPTICAL WORK AND FILTERS ARE
- 6 SUPERFICIAL ACTION. (MURDERS, WEAPONS, ETC. MUST NOT OCCUR.)**
- 7 FORBIDDEN**
TEMPORAL AND GEOGRAPHICAL ALLOCATION ARE (THAT IS TO SAY THAT THE FILM TAKES PLACE HERE AND NOW.)
- 8 GENRE MOVIES ARE NOT ACCEPTABLE.**
- 9 MUST BE ACADEMY 35 MM.**
- 10 THE DIRECTOR MUST NOT BE CREDITED.**

VOW OF CHASTITY

FURTHERMORE
I SWEAR AS A DIRECTOR TO REFRAIN FROM PERSONAL TASTE!
I AM NO LONGER AN ARTIST.
I SWEAR TO REFRAIN FROM CREATING A "WORK", AS I REGARD THE INSTANT AS MORE IMPORTANT THAN THE WHOLE.
I SWEAR MY SUPREME GOAL IS TO FORCE THE TRUTH OUT OF MY CHARACTERS AND SETTINGS.
I SWEAR TO DO SO BY ALL THE MEANS AVAILABLE AND AT THE COST OF ANY GOOD TASTE AND ANY AESTHETIC CONSIDERATIONS.
THUS I MAKE MY VOW OF CHASTITY."

COPENHAGEN, MONDAY 13 MARCH 1995

ON BEHALF OF DOGME 95
 LARS VON TRIER THOMAS VONTERBERG

FUTURISM

F.T. Marinetti
 OF THE DANGER OF
 THE HABIT OF
 SINGING TO
 WE INTEND
 OF ENERGY
 AND
 COURAGE

COURAGE, AUDACITY, AND REVOLT WILL BE ESSENTIAL ELEMENTS OF OUR POETRY

Up to now literature has exalted a pensive immobility, ecstasy, and sleep. We intend to exalt aggressive action, a feverish insomnia, the racer's stride, the mortal leap, the punch and the slap.

We affirm that the world's magnificence has been enriched by a new beauty: the beauty of speed. A racing car whose hood is adorned with great pipes, like serpents of explosive breath—a roaring car that seems to ride on grapeshot is more beautiful than the Victory of Samothrace.

We want to hymn the man at the wheel, who hurls the lance of his spirit across the Earth, along the circle of its orbit.

The poet must spend himself with ardor, splendor, and generosity, to swell the enthusiastic fervor of the primordial elements.

Except in struggle, there is no more beauty. No work without an aggressive character can be a masterpiece. Poetry must be conceived as a violent attack on unknown forces, to reduce and prostrate them before man.

We stand on the last promontory of the centuries!... Why should we look back, when what we want is to break down the mysterious doors of the Impossible? Time and Space died yesterday.

We already live in the absolute, because we have created eternal, omnipresent speed.

We will glorify war—the world's only hygiene—militarism, patriotism, the destructive gesture of freedom-bringers, beautiful ideas worth dying for, and scorn for woman.

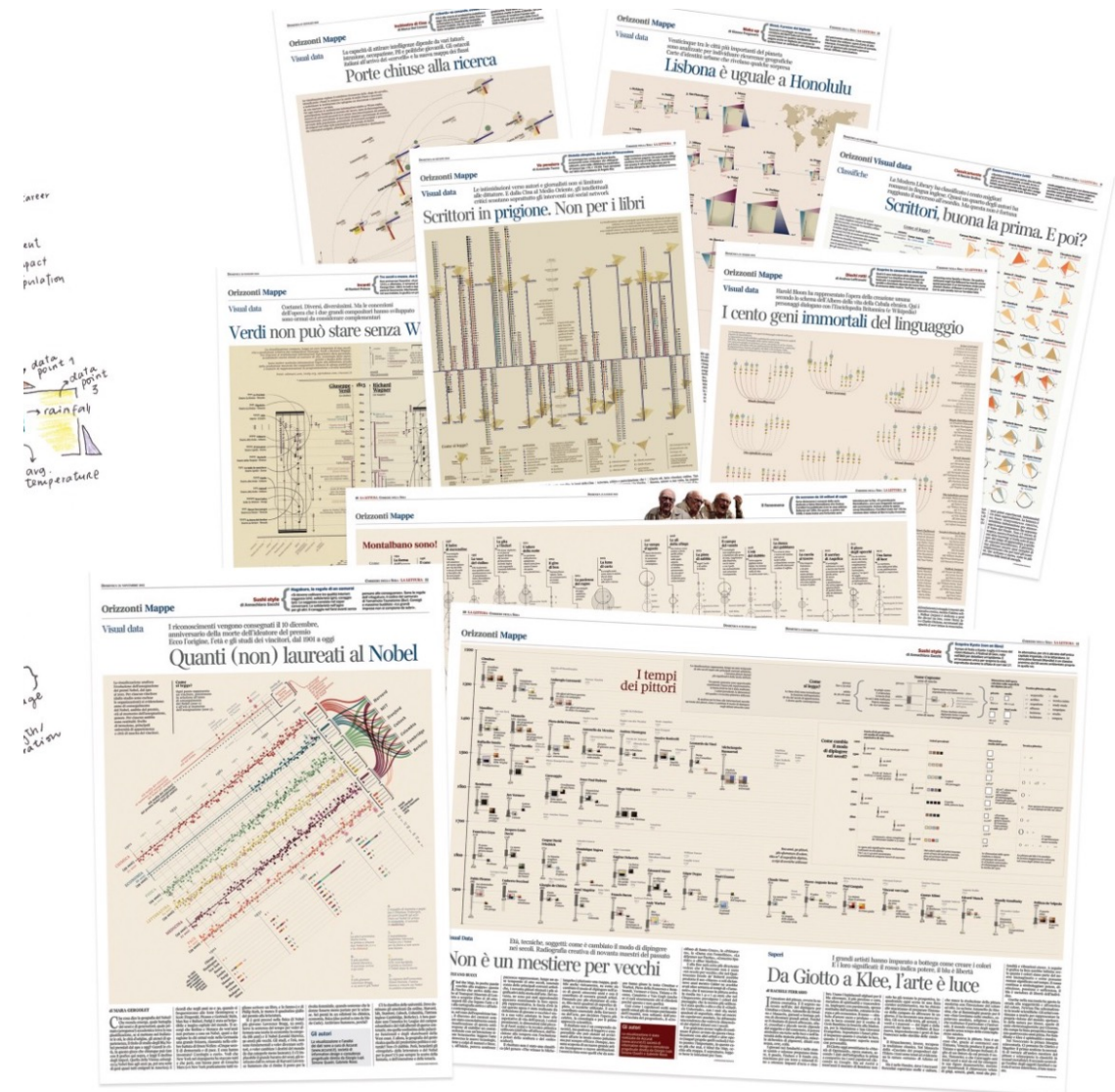
We will sing of great crowds excited by work, by pleasure, and by riot; we will sing of the multicolored, polyphonic tides of revolution in the modern capitals; we will sing of the vibrant nightly fervor of arsenals and shipyards blazing with violent electric moons; greedy railway stations that devour smoke-plumed serpents; factories hung on clouds by the crooked lines of their smoke; bridges that stride the rivers like giant gymnasts, flashing in the sun with a glitter of knives, adventurous steamers that sniff the horizon, deep-chested locomotives whose wheels paw the tracks like the hooves of enormous steel horses bridled by tubing, and the sleek flight of planes whose propellers chatter in the wind like banners and seem to cheer like an enthusiastic crowd.

WE WILL DESTROY THE MUSEUMS, LIBRARIES, ACADEMIES OF EVERY KIND, WILL FIGHT MORALISM, FEMINISM, EVERY OPPORTUNISTIC OR UTILITARIAN COWARDICE

Data Humanism

“We are ready to question the impersonality of a merely technical approach to data and to begin designing ways to connect numbers to what they really stand for: knowledge, behaviors, people.”

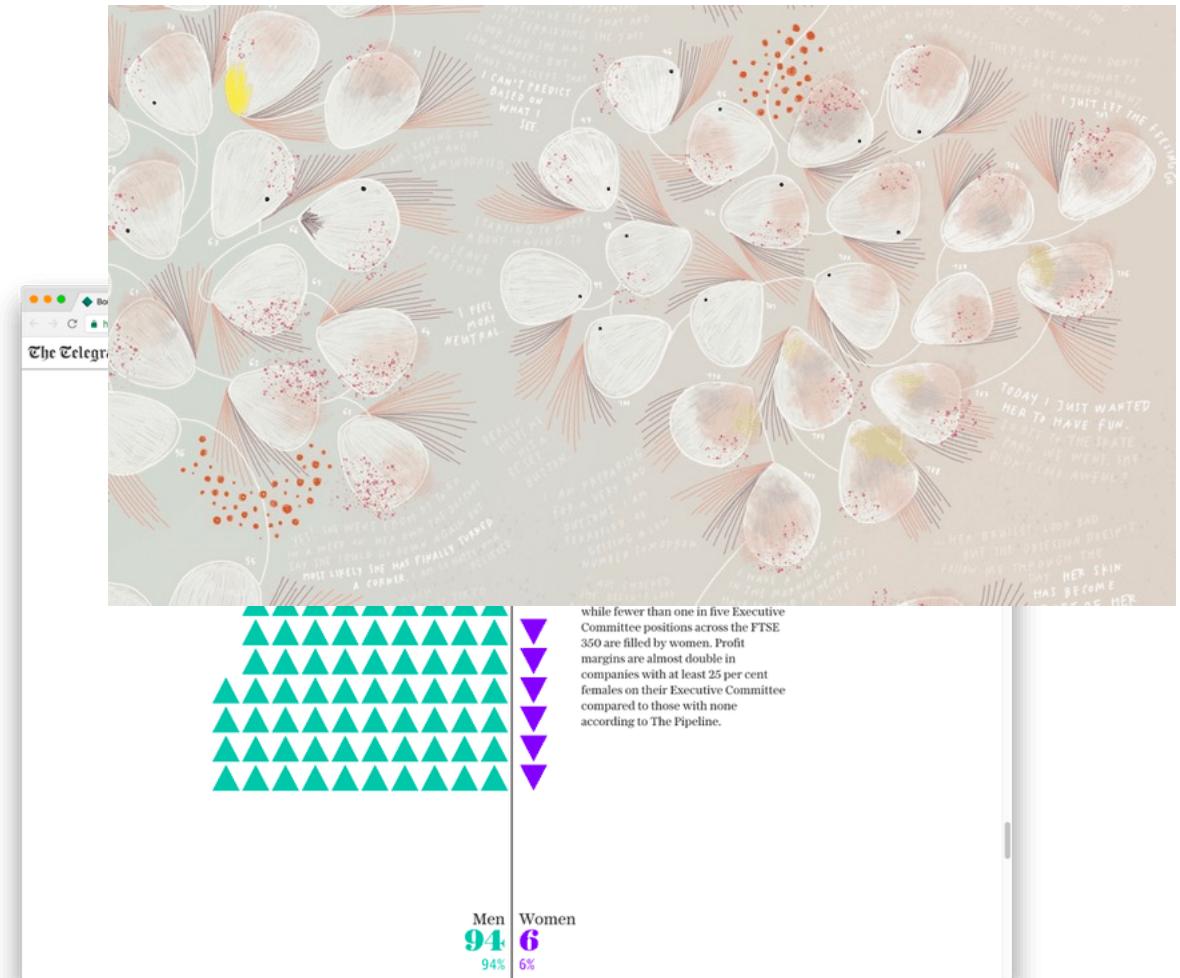
-Giorgia Lupi



Data Feminism

“We call attention to the people and their bodies who are typically included in the data collection process, as well as to the people and their bodies who are typically left out.”

-Lauren Klein and Catherine D’Ignazio

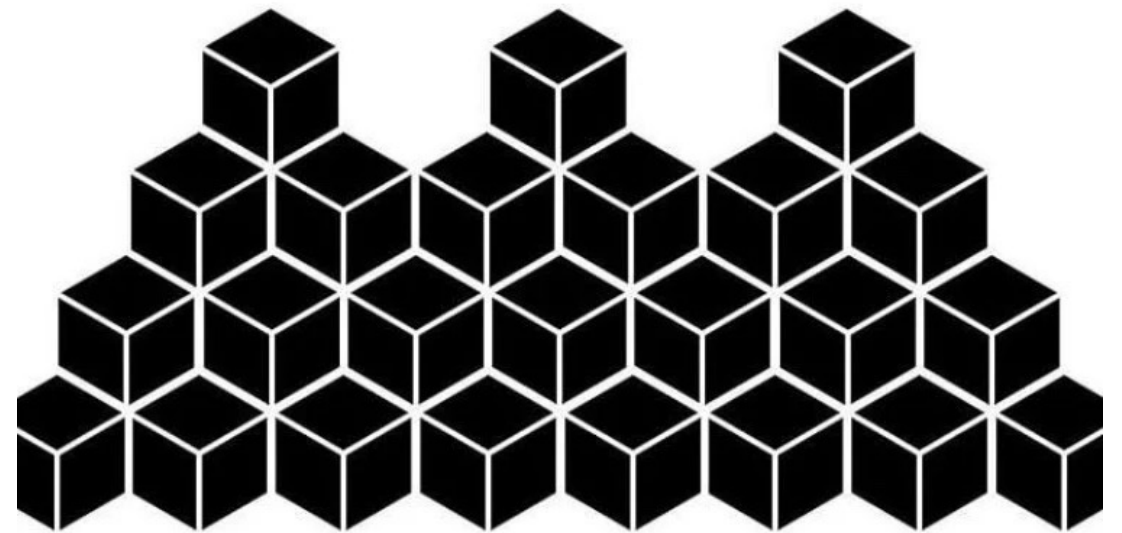


Data for Black Lives

“White supremacy is an algorithm, in and of itself... much of the work for us as data practitioners is to reverse engineer that algorithm.”

-Ejike Obineme

DATA AS PROTEST.



 DATA FOR
BLACK LIVES
CONFERENCE

Human-Computer Insurrection: Notes on an Anarchist HCI

“We must work to ensure our technologies actively contribute to (rather than detract from) human autonomy and dignity.”

-Os Keyes, Josephine Hoy, and Margaret Drouhard



Questions to Ask

Can I identify ethical and unethical data visualizations?

Can I critique the moral character of data visualizations?

Can I impact (or stop) projects I think are unethical?

Thanks!

Michael Correll

correll.io



Why is our conception of “bad” visualization so narrow?



bad visualization



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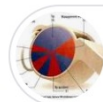
Settings

Tools

SafeSearch



data



pie chart



infographic



good

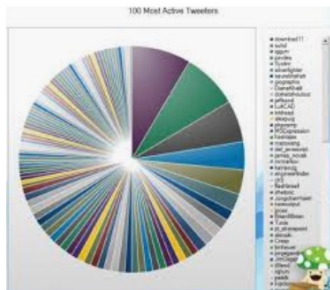
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4 dimensional data

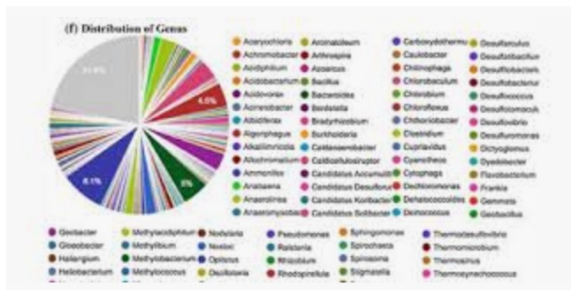
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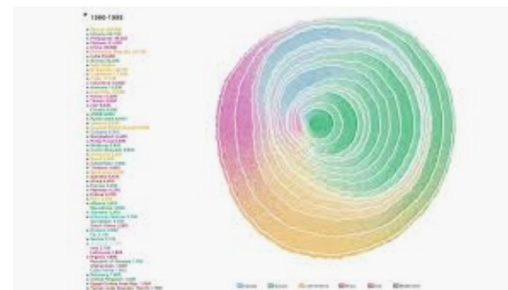
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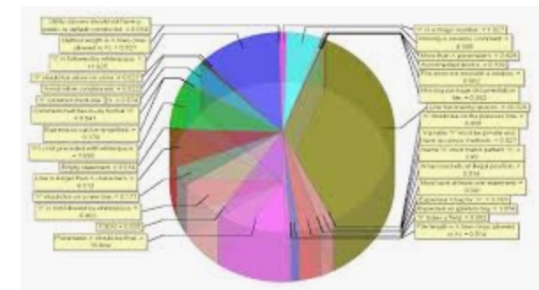
9 Worst Data Visualizations Ev...
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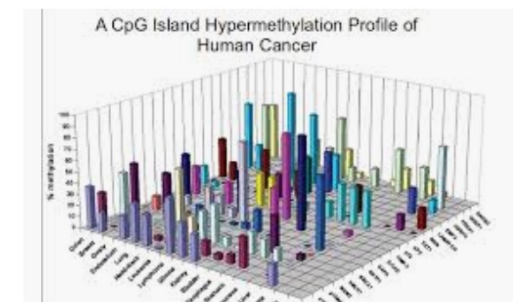
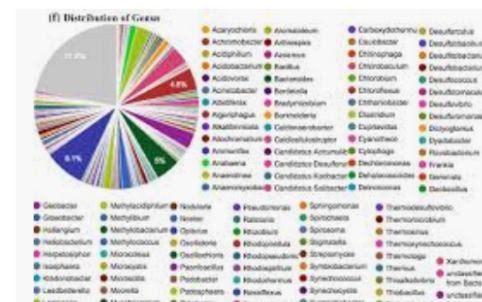
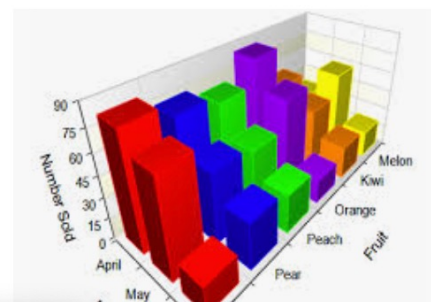
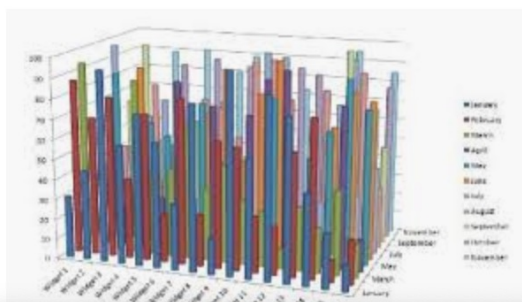
Data Stories: Avoiding Visualization ...
tdwi.org

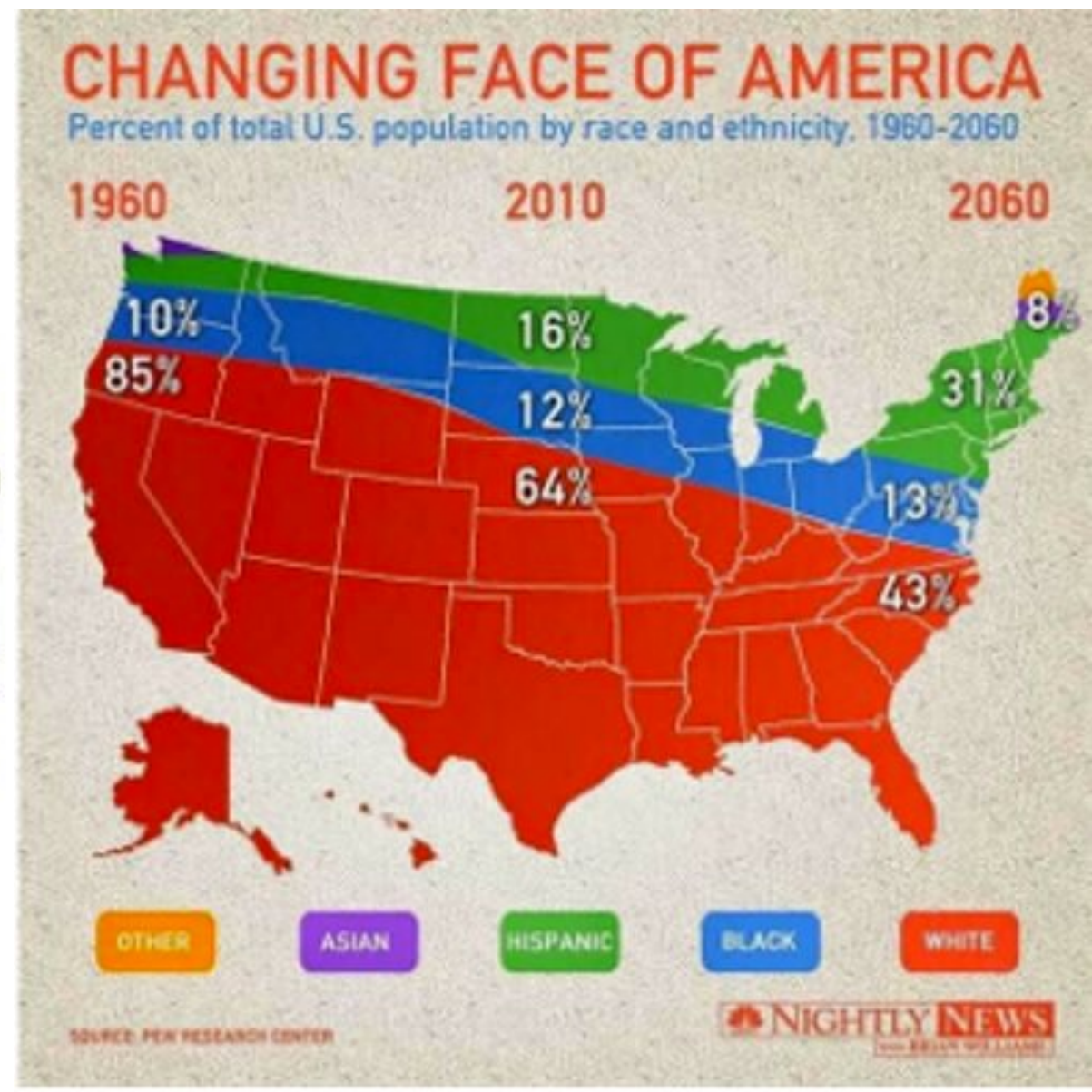
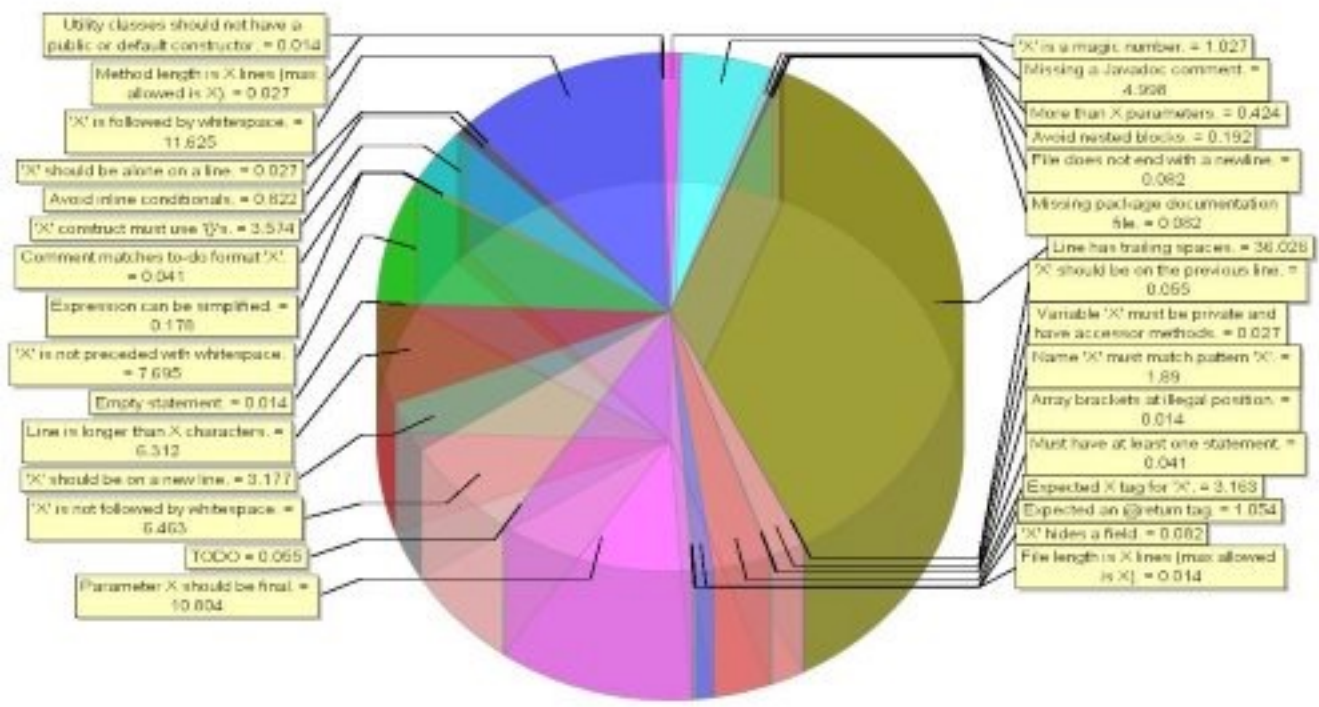


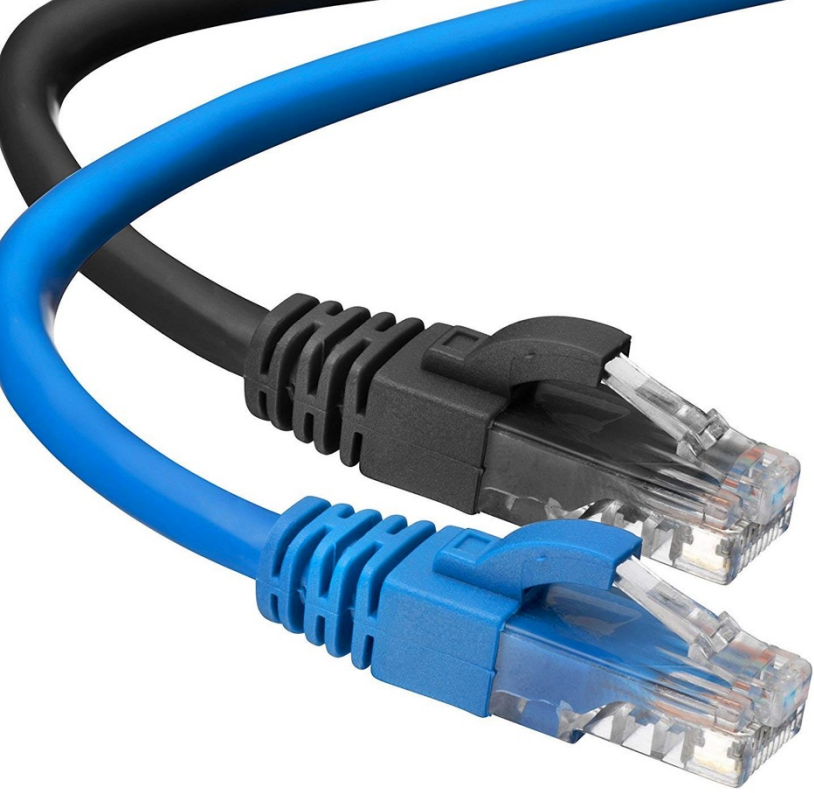
The Best and Worst Data Visualizations ...
kdnuggets.com



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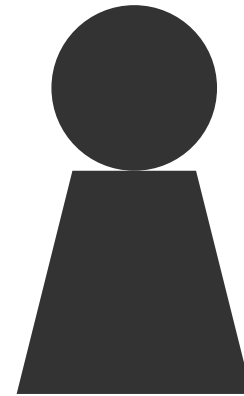
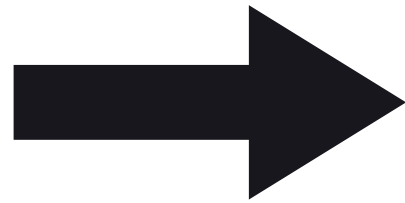


The Ethernet Delusion

“The purpose of visualization is to maximize throughput and minimize noise as you transport a dataset to a person’s brain”



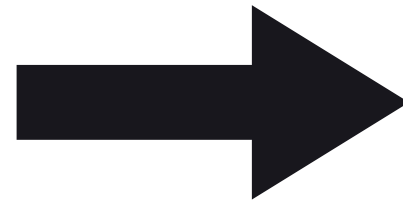
Data



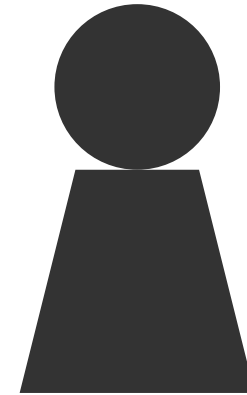
User



Data



Visualization



User

Problems with the Ethernet Delusions

Ignores the source and rhetorical objective of visualization

Assumes data are objective truths about the world

Pre-supposes that you *must* create a visualization



Call Type Summary



Crimes Against Persons

21

Assault

8

Robbery

5

Threats

8



Assisting the Public

18



Drugs and Vice

17



Property Crime/Theft

75

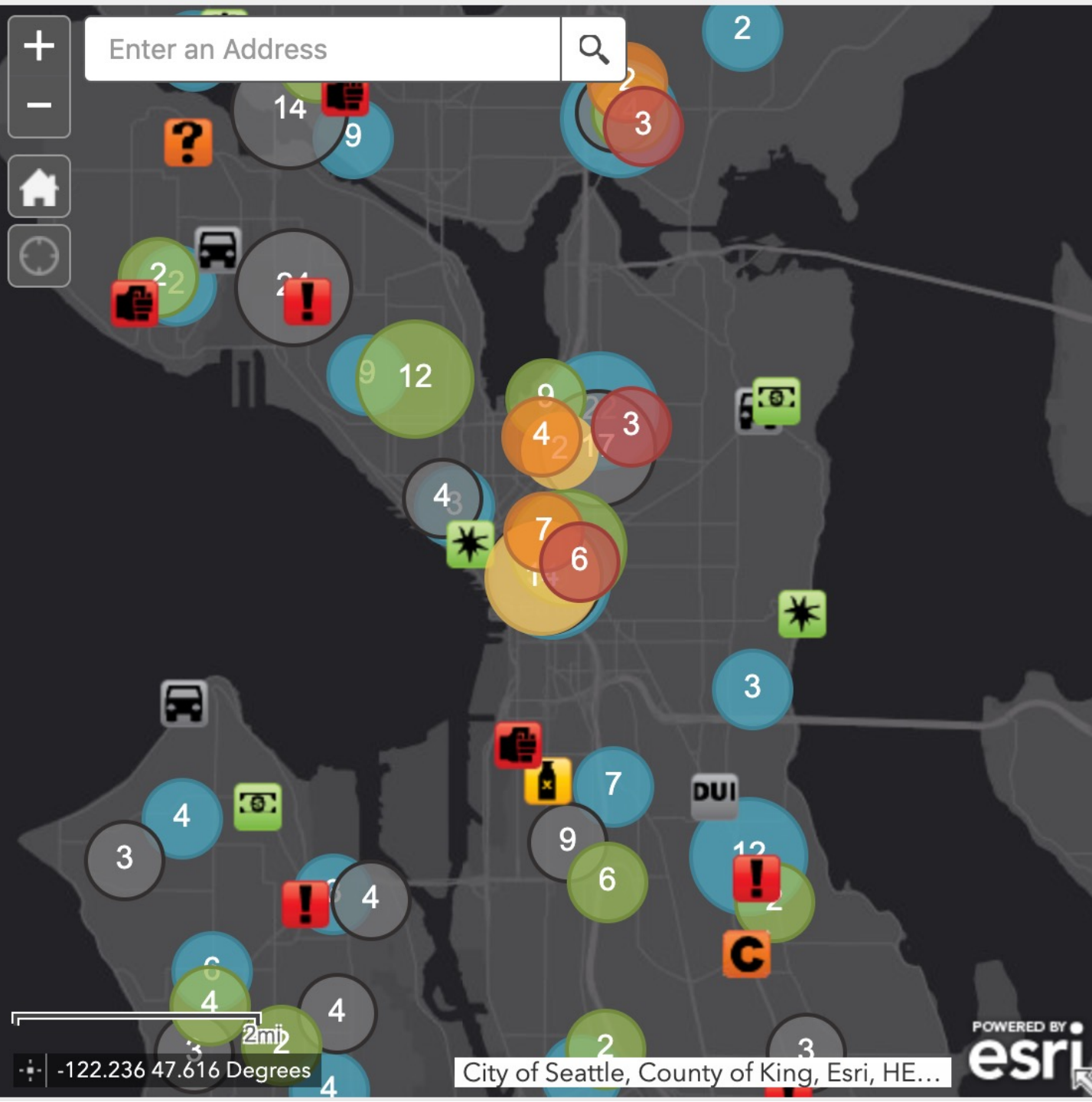


-

100



Enter an Address



-122.236 47.616 Degrees

City of Seattle, County of King, Esri, HE...



Add Map Labels

Remove Color-Coding



Hide Overlays

2010 Census Block Data

1 Dot = 1 Person

- White
- Black
- Asian
- Hispanic
- Other Race / Native American / Multi-racial

What am I looking at...?



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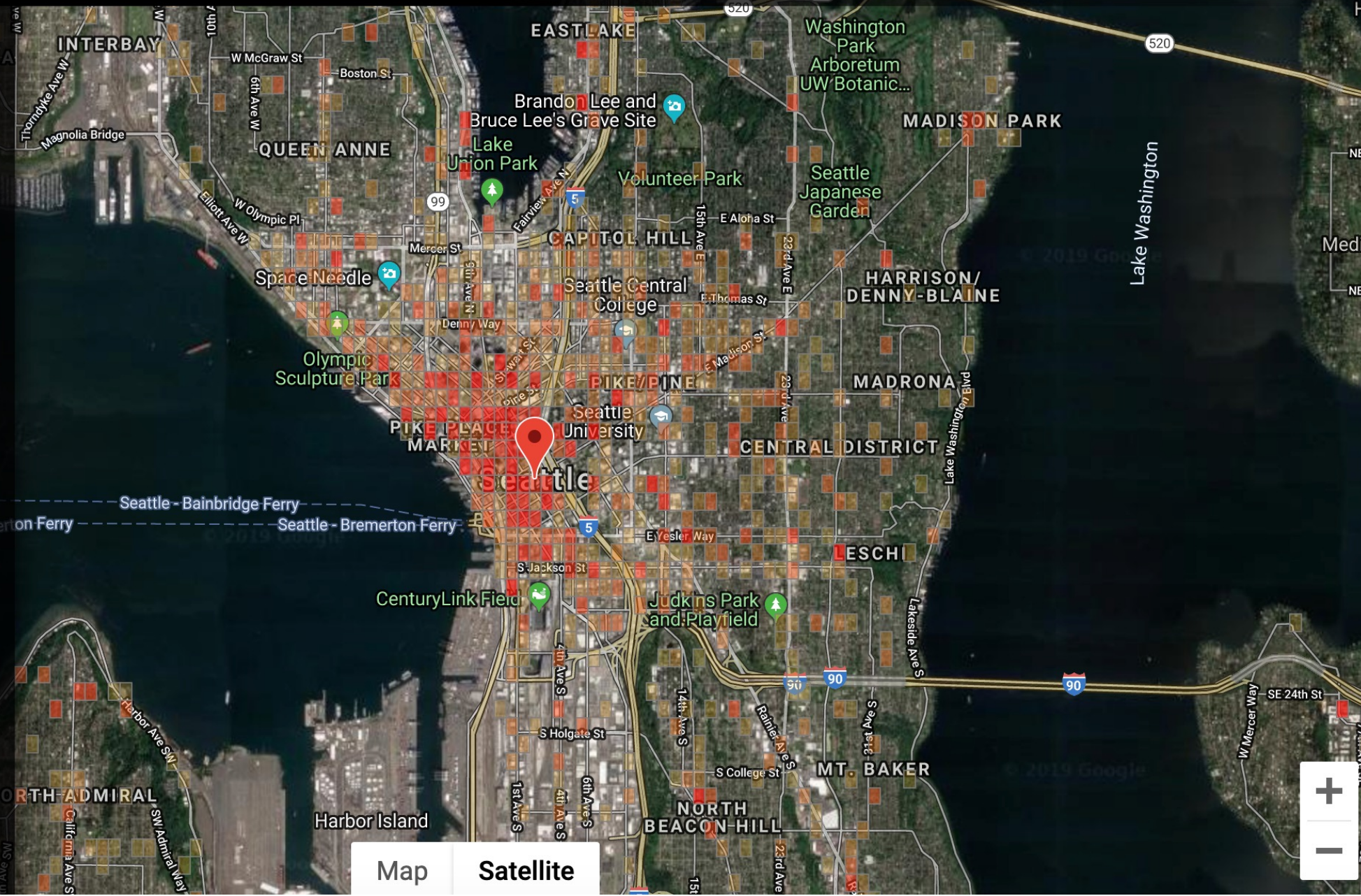
WHITE COLLAR CRIME RISK ZONES

THE NEW INQUIRY



White Collar Crime Risk Zones uses machine learning to predict where financial crimes are mostly likely to occur across the US. To learn about our methodology, read our [white paper](#).

By [Brian Clifton](#), [Sam Lavigne](#) and [Francis Tseng](#) for *The New Inquiry Magazine*, Vol. 59: **ABOLISH.**



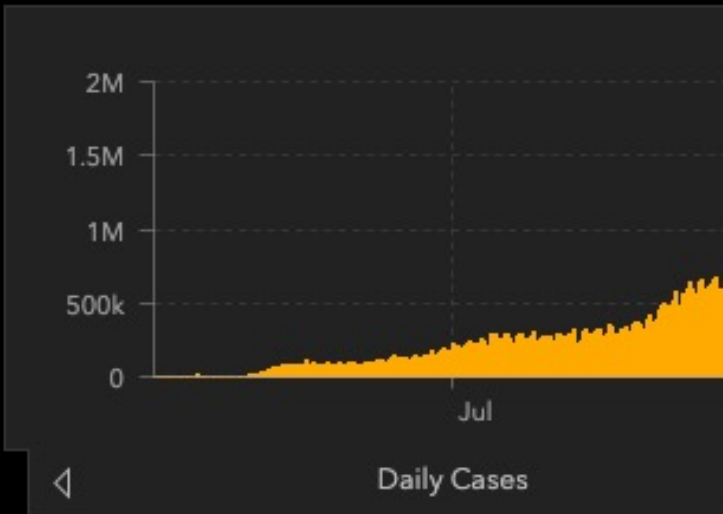
Map Satellite





Global Deaths

US Deaths, Recovered



- Cumulative Cases
- Active Cases
- Incidence Rate
- Case-Fatality Ratio
- Testing Rate

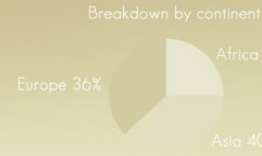
191
countries/regions

Lancet Inf Dis Article: [Here](#). Mobile Version: [Here](#). Data sources: [Full list](#). Downloadable database: [GitHub](#), [Feature Layer](#).
 Lead by [JHU CSSE](#). Technical Support: [Esri Living Atlas team](#) and [JHU APL](#). Financial Support: [JHU CSSE](#), [Esri](#), [Rockwell Automation](#), [IBM](#), [Cisco](#), [Microsoft](#), [Facebook](#), [Google](#), [Amazon](#), [Apple](#), [Twitter](#), [LinkedIn](#), [YouTube](#), [Instagram](#), [Snapchat](#), [TikTok](#), [Pinterest](#), [Tumblr](#), [Medium](#), [SoundCloud](#), [Spotify](#), [iHeartRadio](#), [Pandora](#), [Deezer](#), [Amazon Music](#), [YouTube Music](#), [Apple Music](#), [Spotify](#), [iHeartRadio](#), [Pandora](#), [Deezer](#), [Amazon Music](#), [YouTube Music](#), [Apple Music](#).

100 years of world cuisine

38,000,000 deaths
 100yearsofworldcuisine.com

25 conflicts
 1915 - present



Armenian genocide 1915-16
1,500,000 †

Korea war 1950-53
3,500,000 †

Congo wars 1998-2003
3,900,000 †

Biafran war 1967-70
1,000,000 †

Sudanese civil war 1983-2005
2,200,000 †

Gulag system 1929-53
1,600,000 †

Wars in Indochina 1945-75
6,000,000 †

Iraq 2003-2010
100,000 †

Holodomor 1932-33
3,000,000 †

North Korean famine 1990-ongoing
2,000,000 †

Stalingrad 1942-43
1,520,000 †

Khmer genocide 1975-79
3,000,000 †

Romas 1941-45
200,000 †

Holocaust 1941-45
5,000,000 †

Expulsion of Germans after WW2 1944-45
500,000 †

Immigration to Europe 1988-ongoing
15,000 †

Afghanistan 2001-ongoing
40,000 †

Mexican drug war 2006-ongoing
30,000 †

Arab-Israeli conflict 1950-ongoing
51,000 †

Chechen wars 1999-ongoing
160,000 †

Yugoslav wars 1991-95
130,000 †

Algeria war 1954-62
960,000 †

9/11 attacks 2001
2,997 †

Rwandan genocide 1994
1,000,000 †

Iran-Iraq war 1980-88
500,000 †

Partition of India 1947
500,000 †