CSC290 Communication Skills for Computer Scientists

Lisa Zhang

Lecture 2; Sep 17, 2018

Announcements

Blog post #1 due Sunday 8:59pm

- Submit a link to your blog post on MarkUs (should be operational next few days)
- Create a file called `link.txt`, write the URL of the *blog post* (not your entire blog) in the file
- Submit `link.txt` to MarkUs.

Blog post #2 is optional, but highly recommended!

Example Blog Post

https://brandonjoubran4.wixsite.com/blog-spot/home/hello-world
https://medium.com/cra1gblog/introduction-b42d2bc8ab6f

- Informative title, good structure, well written
- Easy to read: font / colour
- Easy to skim: paragraphs / topic sentences
- There is something interesting / memorable about the author

Common issues

- Grammar
- Colour: easier to read light background, dark text on screens
- Large images: have to scroll to get to content
- Font size: too small
- Text width: too long
- Justification: text should be left justified, not centered
- Length & structure:
  - paragraphs
  - don't just answer the prompt questions one by one!

Default style is okay; if you want to change the style, do so mindfully.

Critical Review

- Read the article before the tutorial on Friday
- Required reading:
  - Transition to University
  - Grammar Hit Parade
- Start a draft as soon as you can
  - Your first draft will suck, that's okay!
  - You will think of ideas as you start writing.
  - Revise, revise, revise!

. . .t

- Drop-ins available at the RGASC, 3rd floor North Building
  - Mon, Sep 24 @ 3pm – 7pm
  - by appointment

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Questions?

Critical Thinking

Why Critical Thinking?

Personal and professional life is full of open-ended problems that have significant uncertainties and no definitive answers

- How can a leader promote more effective teamwork?
- What career should you pursue after graduating with a CS degree?
- Which open source project should I contribute my time to?

Some Qualities of Critical Thinking

- Asking probing questions
- Not blindly accepting facts and memorizing
- Acknowledgement of limitations
- Ability to questions one's own bias
- Ability to prioritize information
- Effective communication and articulation of information

How do I Support My Argument?

Conceptual argument does not rely on scientific/statistical data.

For example, if you think software piracy is wrong because you think stealing is wrong, you might argue that software piracy is a form of stealing. You don't use scientific data or statistics to make this point; you would have to write about the meaning of 'steal' and explain how you can steal software.

How do I Support My Argument?

Empirical argument relies on scientific data.

For example, if you think software piracy is harmless because people only pirate software they wouldn't buy, you would need to find a reputable study showing that software pirates only pirate software they wouldn't buy.

Components of an Argument

- **Claim**: The position you are attempting to establish
- **Grounds**: Reasons or evidence in support of the claim
  - An argument is no stronger than the grounds that support it
- **Warrant**: What legitimises the claim based on the grounds
  - e.g. “that claim is not warranted”

Example

A basic education is more important than fancy degrees that nobody uses. If we have to cut education funding, it should be university funding.

- What is the claim? What are the grounds? Is the claim warranted?
- Is the argument conceptual or empirical?

Example

We interviewed 10 business professionals, and 8 of them agreed that we should continue to teach cursive in elementary school.

- What is the claim? What are the grounds? Is the claim warranted?
- Is the argument conceptual or empirical?

Worksheet

- Worksheet - Page 1

Fallacy

What is a **fallacy**?

- a mistaken belief, especially one based on unsound argument
- a failure in reasoning that renders an argument invalid
- faulty reasoning; misleading or unsound argument

In short, fallacies are “bugs” in arguments.

Fallacies in conceptual arguments

- Bob thinks that learning more than one programming language is useless.
  - Bob is a jerk.
  - Therefore, Bob's arguments are worthless.

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  - Alice did not go to class at all.
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Ad hominen: argument that attacks attributes of the person making the argument.

Is there attribute related to the claim in a significant way?

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Vested interest fallacies: dismissing an argument on the ground that the person making the argument stands to gain from the argument being accepted.

You should not discount an argument because of vested interest, but consider the context and other evidence available.

Fallacies in conceptual arguments

- We shouldn't aim for 100% computer literacy because if everyone is on their computers, there would be no one left to farm.

Fallacies in conceptual arguments

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Straw man fallacies: deliberately confuse an argument with a weaker argument.

Are you really understanding the concepts?

Fallacies in conceptual arguments

Other fallacies:

- **The fallacy fallacy**: There is a fallacy in the reasoning, therefore the claim is false.
  - The claim may be warranted, for other reasons.
- **Black swan fallacy**: I haven't seen a black swan, therefore it doesn't exist.
  - How hard have you looked? Are you a bird expert or do you never go out?
- **Inappropriate appeal to authority**:
  - What is the experience of the authority? Can they justify their reasoning?
- **Inappropriate analogies**:
  - Where does the analogy fall apart?

Grammar break

What is wrong with the following sentence?

Alice told Mary that her code does not compile.

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Alice told Mary that **her** code does not compile.

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- Alice told Mary, “Your code does not compile.”
- Alice told Mary, “My code does not compile.”

What is wrong with the following sentence?

It says that ambiguous references are bad.

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- It says in the instructions that ambiguous references are bad.

Not as preferable, because the reader has to wait for the subject of the sentence.

Fill in the blank with the correct word

Please make sure that _____ code follows the PEP8 style guide.

- your
- you're

Fill in the blank with the correct word

Please make sure that _____ code follows the PEP8 style guide.

- your
- you're

Please make sure that **your** code follows the PEP8 style guide.

- your = belongs to you
- you're = you are

Fill in the blank with the correct word

Are _____ enough papers for everyone?

- they're
- there
- their

Fill in the blank with the correct word

Are _____ enough papers for everyone?

- they're
- there
- their

Are **there** enough papers for everyone?

- they're = they are
- there = a place
- their = belongs to them

Grammar worksheet

Work with a partner!

Back to Fallacies

Worksheet

- Worksheet - Page 2

Fallacies in empirical arguments

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If A and B are correlated, then we can have:

- A cause B
- B cause A
- A, B have a common cause C (called a **confounder** or **confounding factor**)

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In this case, **seasonality** is a confounder that causes both ice cream consumption and crime rates to increase.

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Low sample size: sample size too small with respect to the group that you want to make a claim about.

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- "Globe and Mail" collects a postal survey asking people in Toronto who they would vote for in the municipal election to predict the election result.

Biased sample: Is your sample representative of the group in your claim?

Fallacies in empirical arguments

- In a study published in 1980, researchers interviewed 300 computer science students, and determined that scheduling computing time is a major obstacle for their learning. The department should spend significant resources to resolve this issue.

Timing of study: Is your study recent? What does *recent* mean?

Fallacies in empirical arguments

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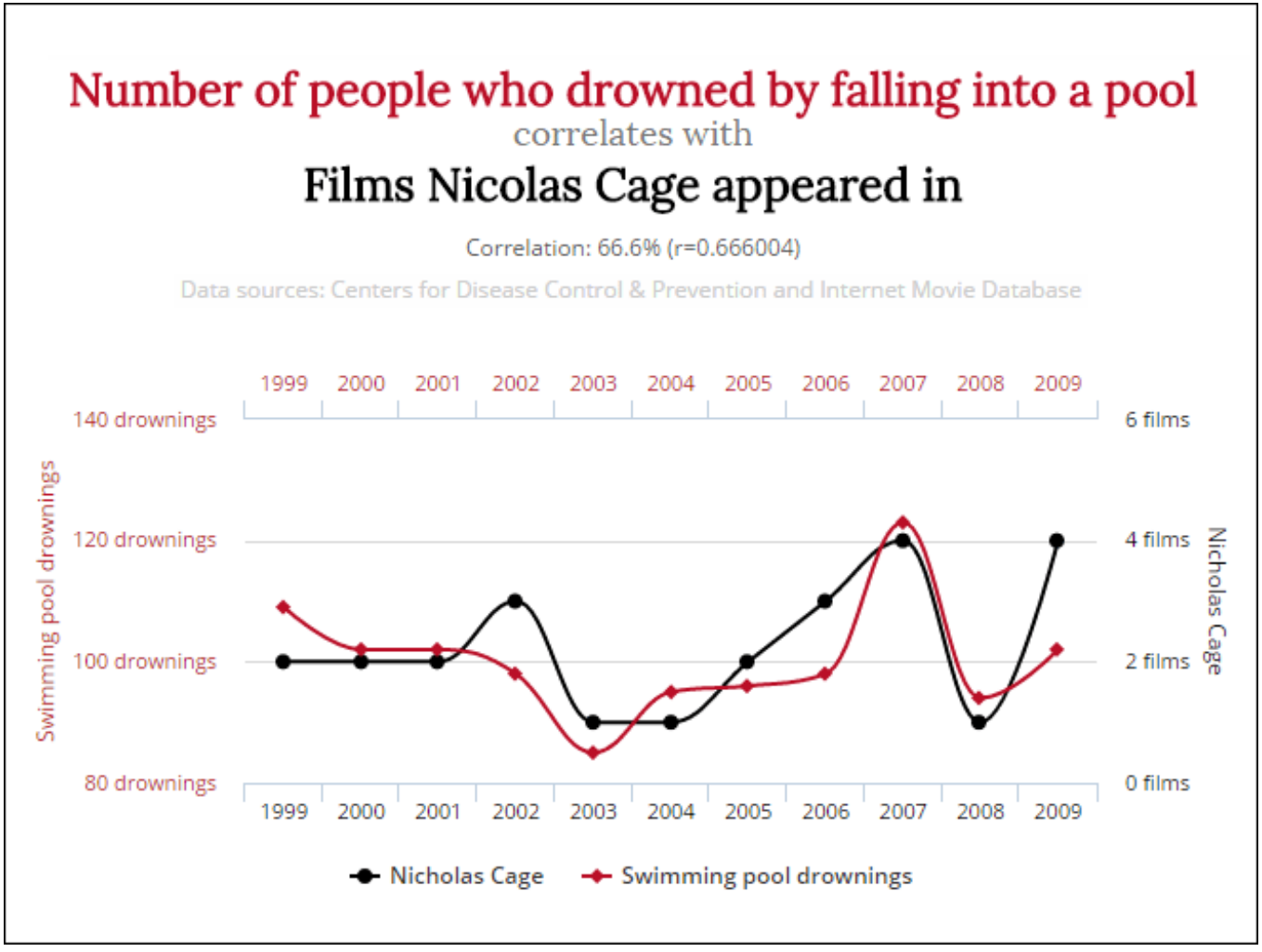
- A study on employees relationship with their boss is conducted by interviewing employees and asking them, "Do you have any problems with your boss?"
- **Leading question**: Are survey questions leading? What is the default answer?

Fallacies in empirical arguments



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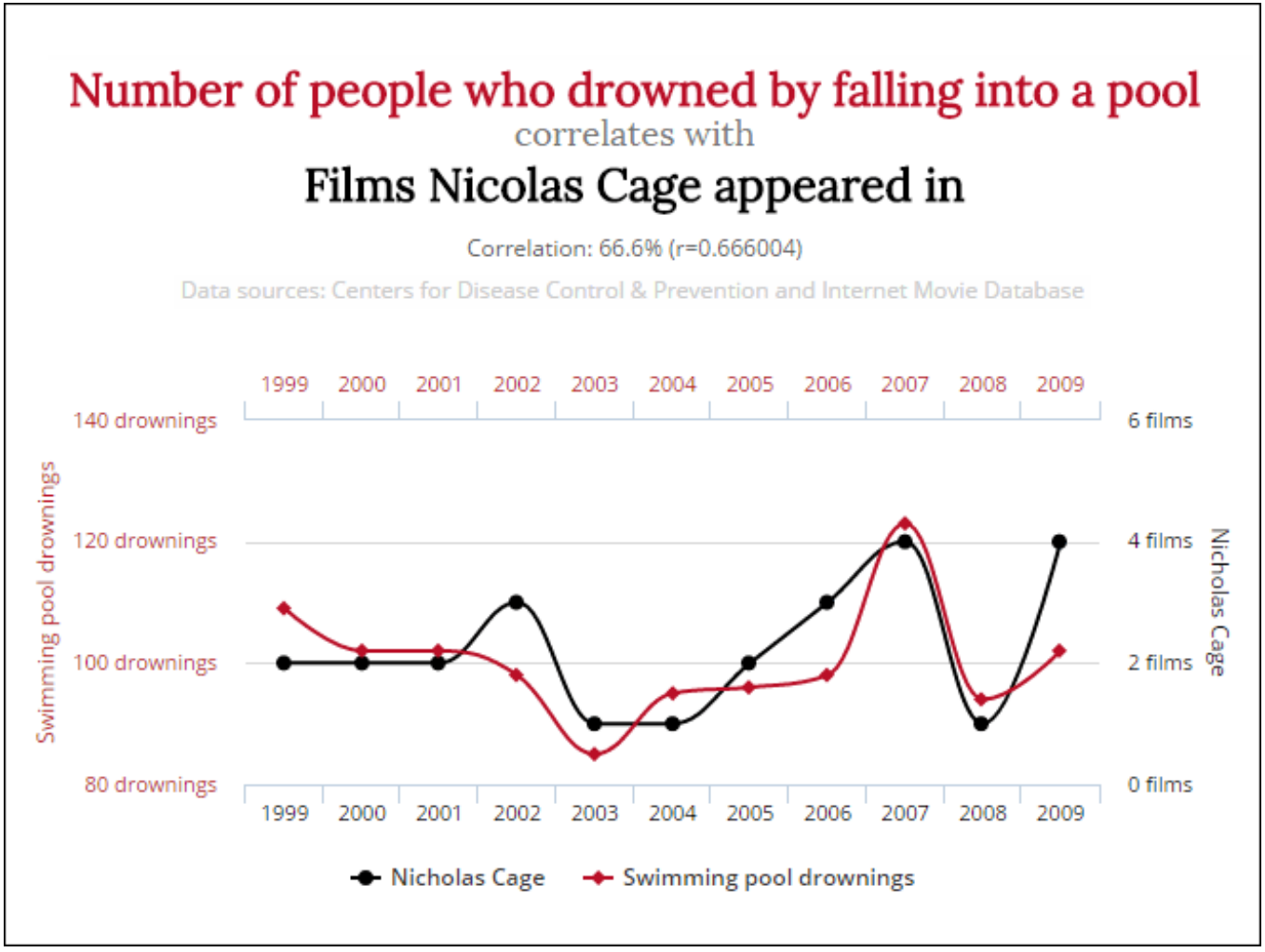

- **p-hacking**: Looking through lots of data to try and find spurious *correlations*.

Fallacies in empirical arguments

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- Aircrafts damaged in vulnerable parts never made it back.
- Therefore, reinforce areas in returned aircrafts with *less* damage!

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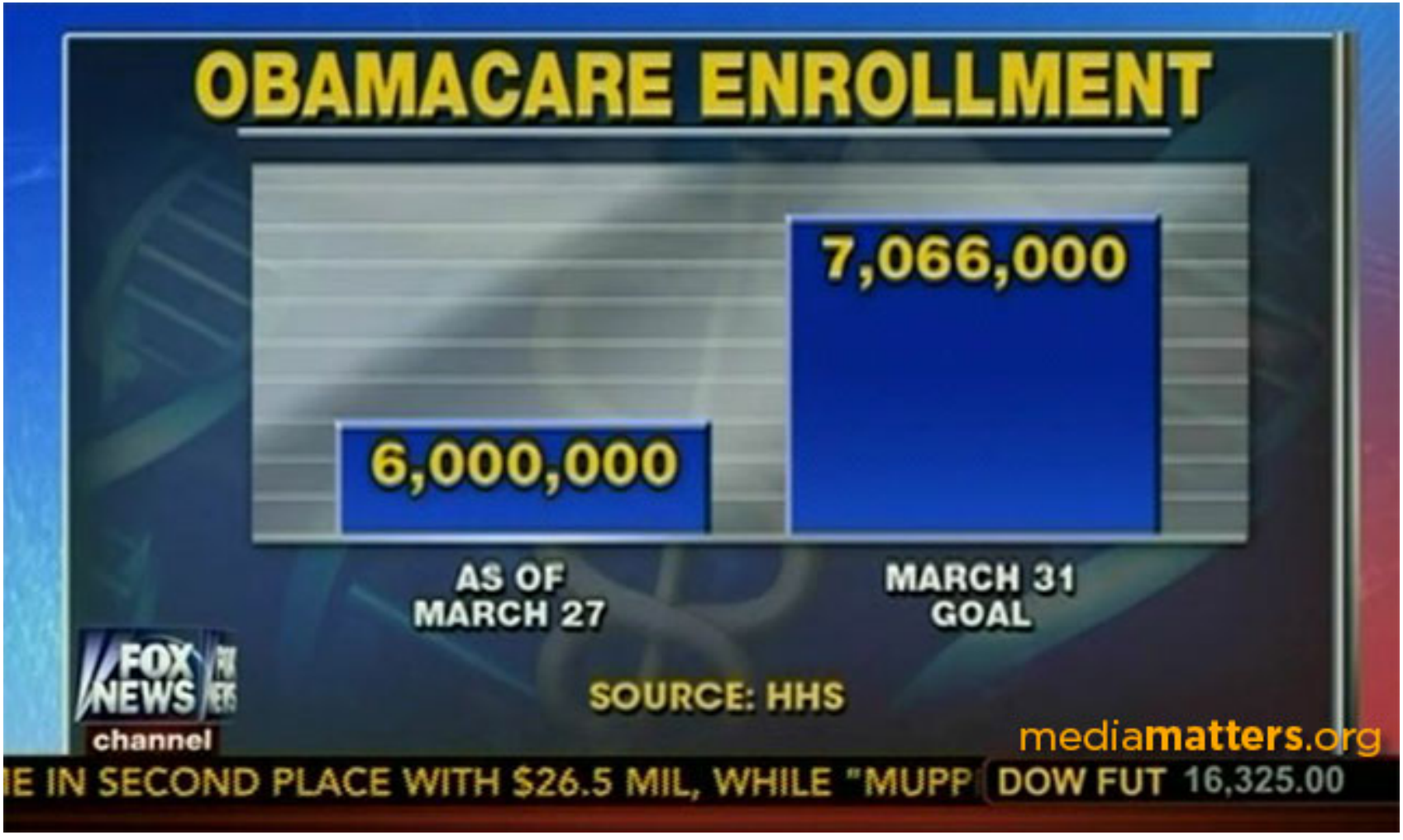
Survivorship bias: Does your sample only contain "survivors"?

What is wrong with this chart?



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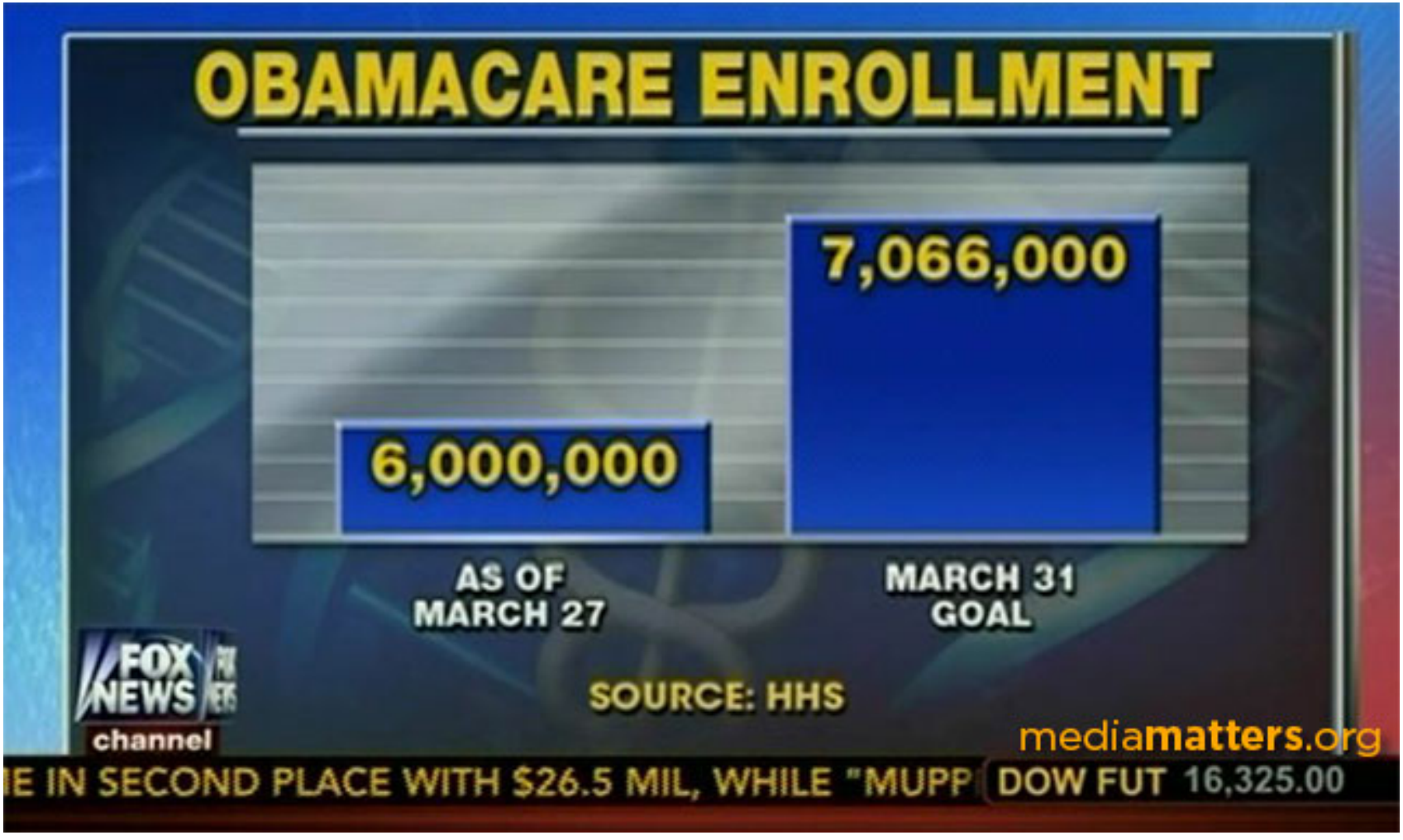
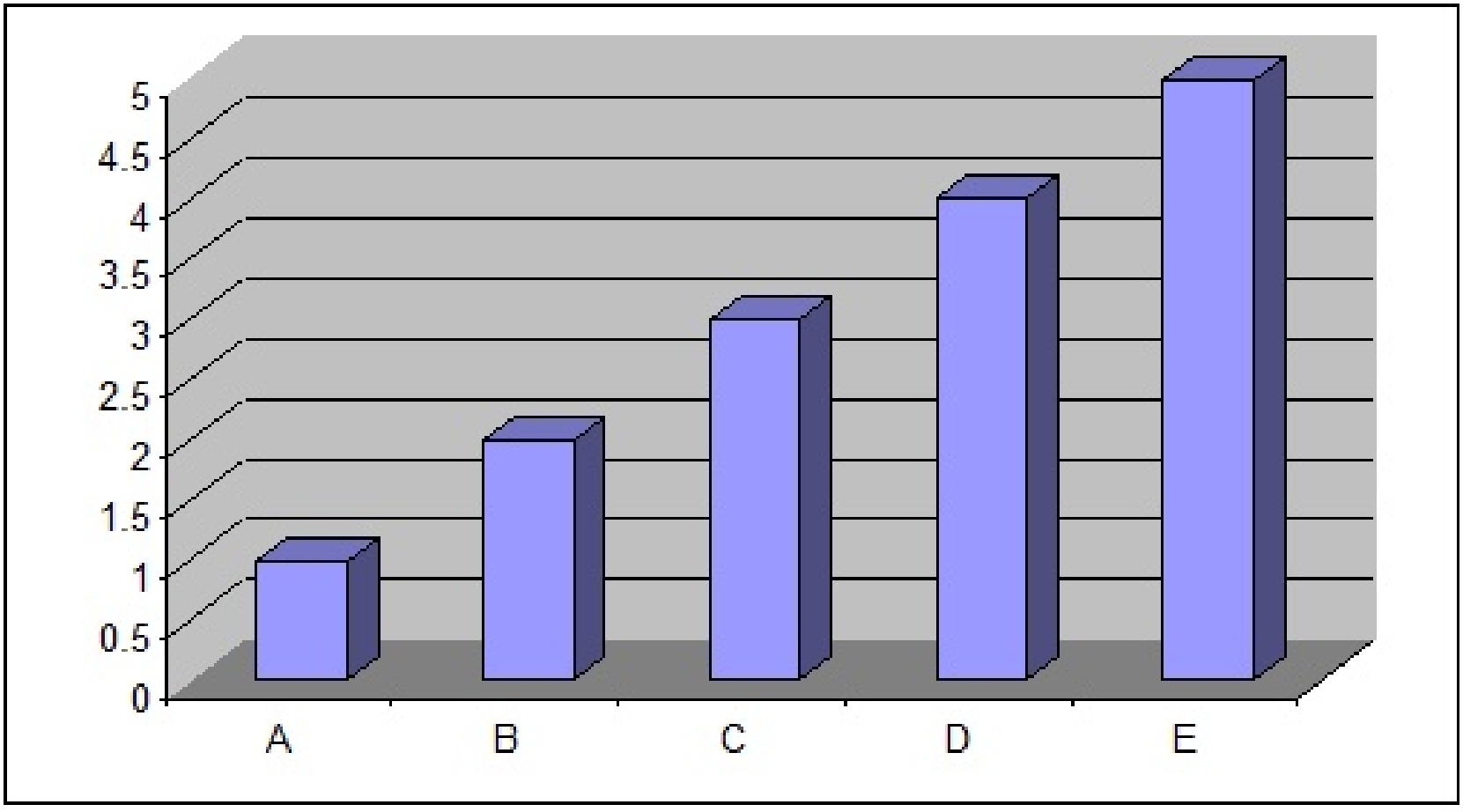


- **misleading axis**: bar chart axis should start at 0, so the bar *areas* are proportional.

Corrected visualization

3D Bar Charts



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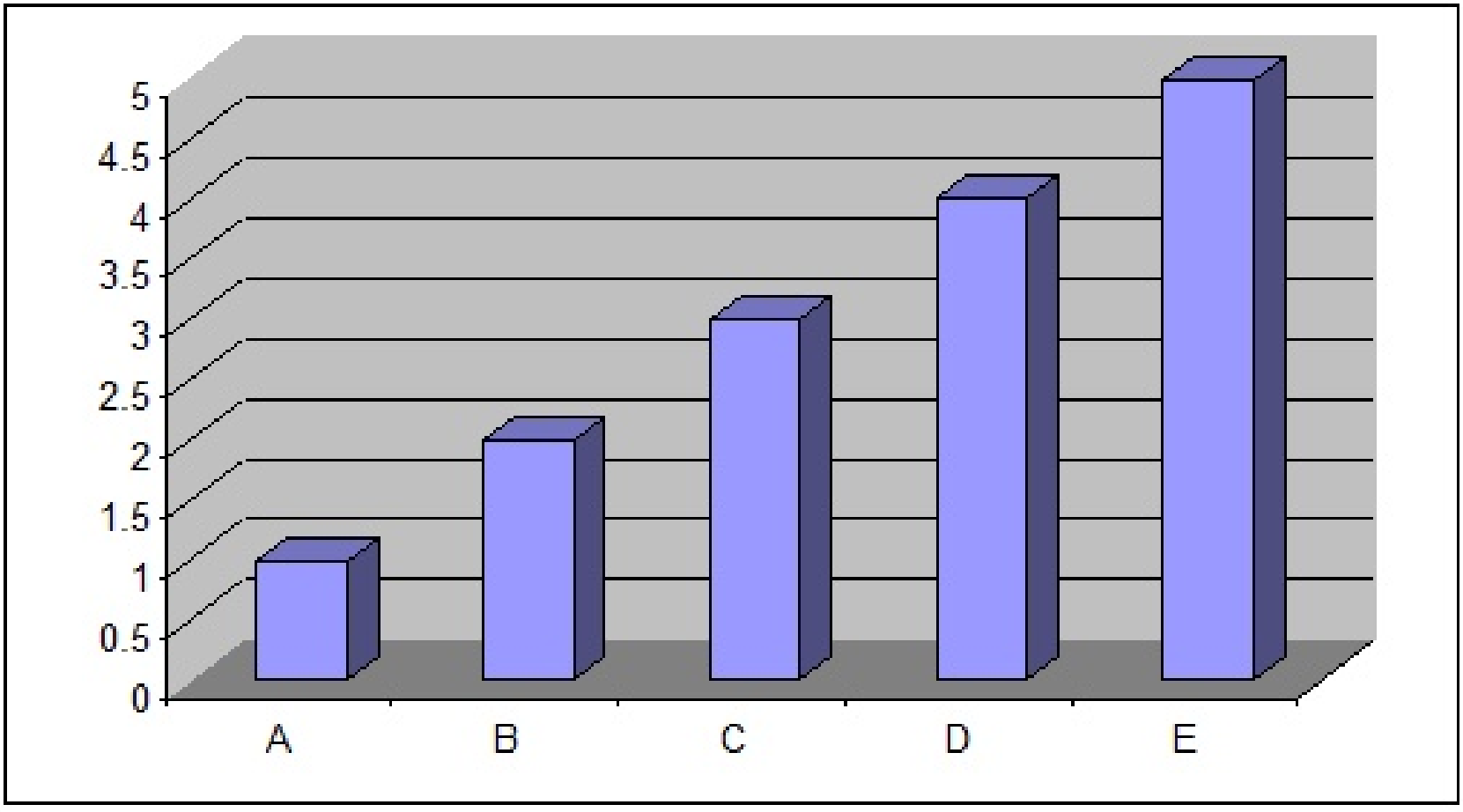
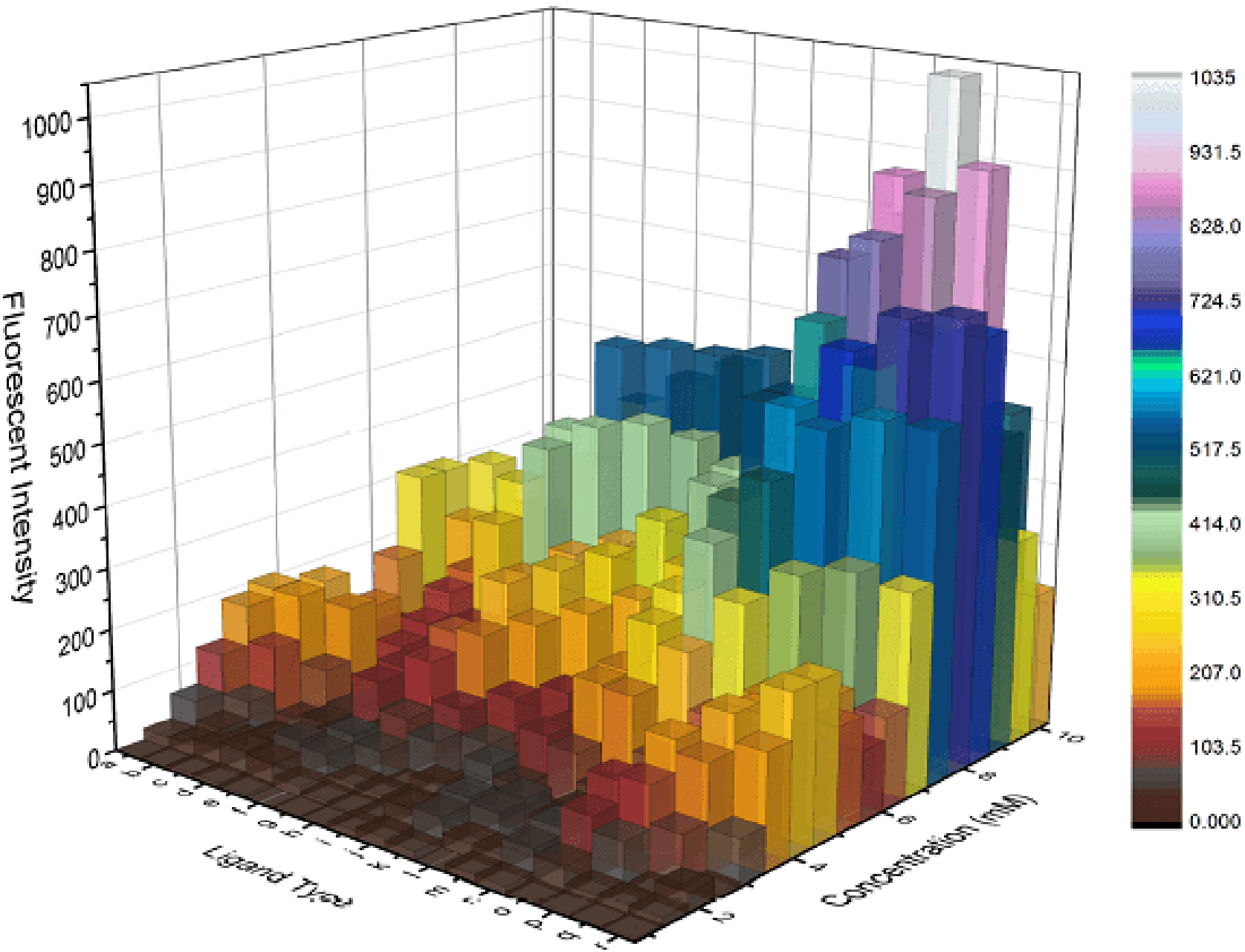


A = 1, but can you really tell?

Unreadable Visualizations



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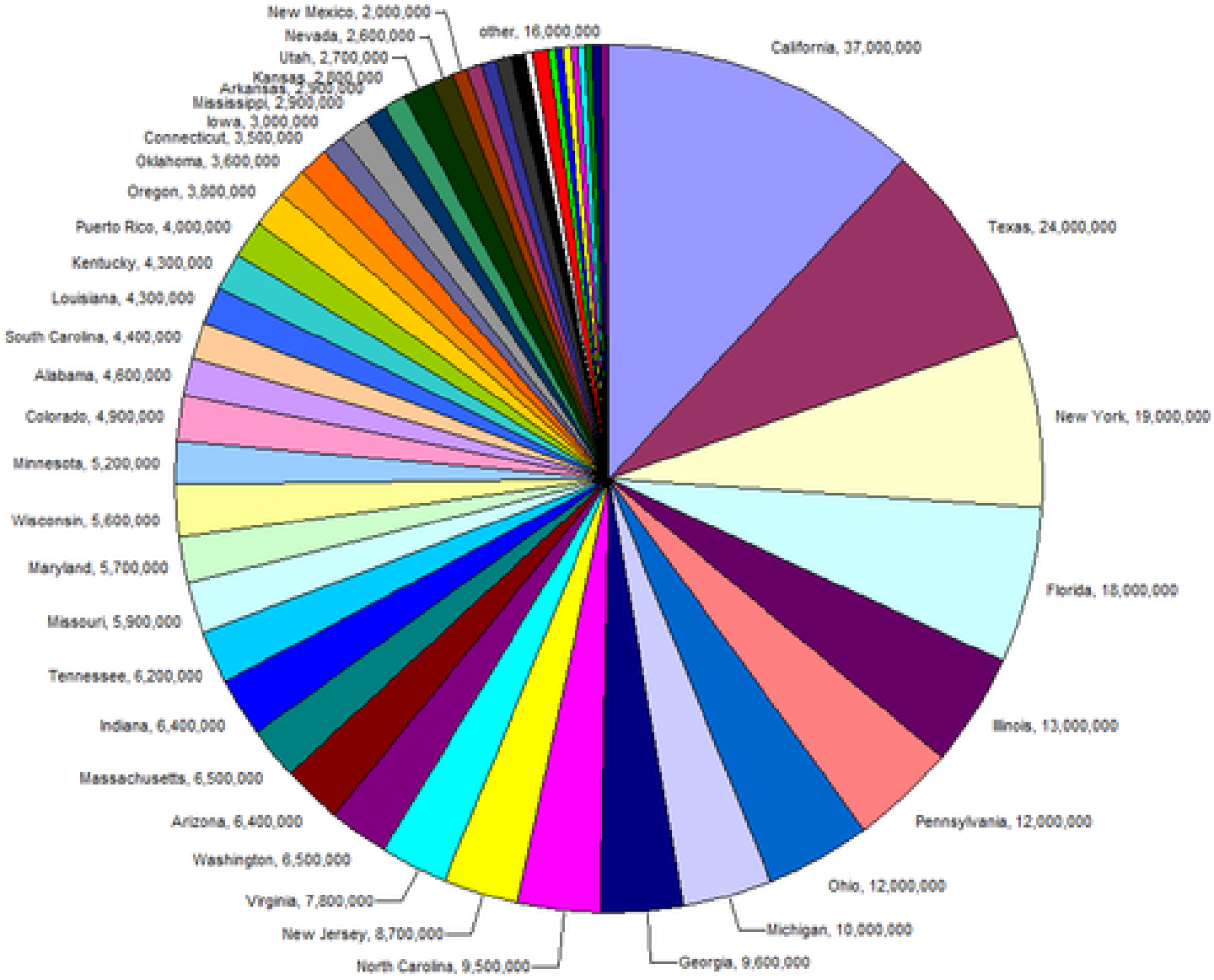

Your Critical Review

These slides show just some of the ways to critically evaluate a work.

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A good critical review should have.

- Clear and concise summary of the text.
- Analysis on why the text is (or isn't) convincing.
- What can the author do to be more convincing (more experiments? look at data differently?)
- Good structure, grammar, readability, etc.

References

These slides borrow heavily from the following material:

[0] Nia McNash's CSC290 slides
[1] https://www.cs.ox.ac.uk/people/michael.wooldridge/teaching/lect04.pdf
[2] https://pdfs.semanticscholar.org/presentation/6e54/bf3d8dc44dd7552fb1e9fe86127401f9c259.pdf