CS-5630 / CS-6630 Visualization for Data Science
How to Critique a Vis and Exam Review

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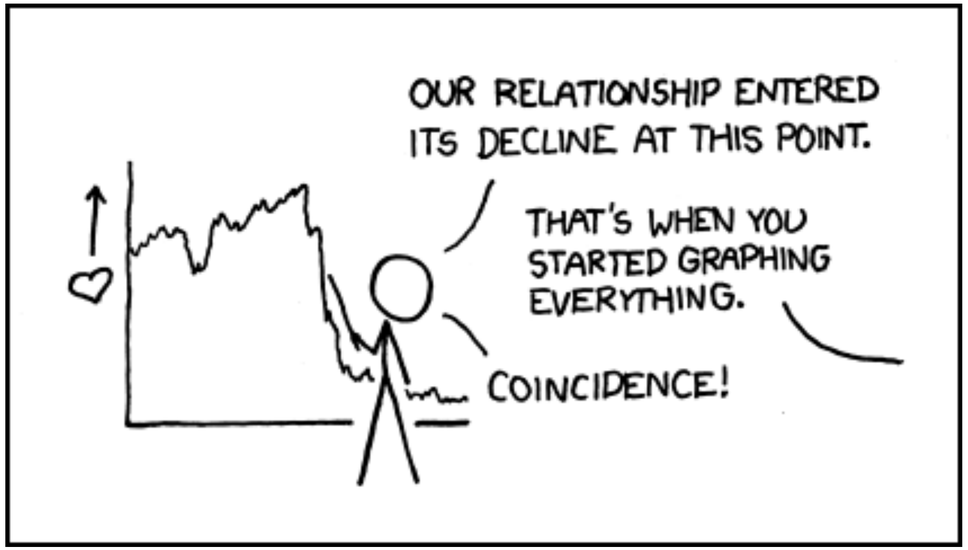
THE UNIVERSITY OF UTAH



[xkcd]

Exam

Theory Questions

- What's bad about a rainbow color scale?
- Which channels are good for quantitative data?

Design Critique

- Given a vis, analyze what's good/bad and redesign.

Conceptual questions about HTML/D3/JavaScript

- How does data binding work? How do you access data? Where is the bound data stored in the DOM? What is the DOM?

Find the bug question.

Grads: Question about readings (Crowdsourcing, Interaction)

1. Identify Data, Tasks / Intentions

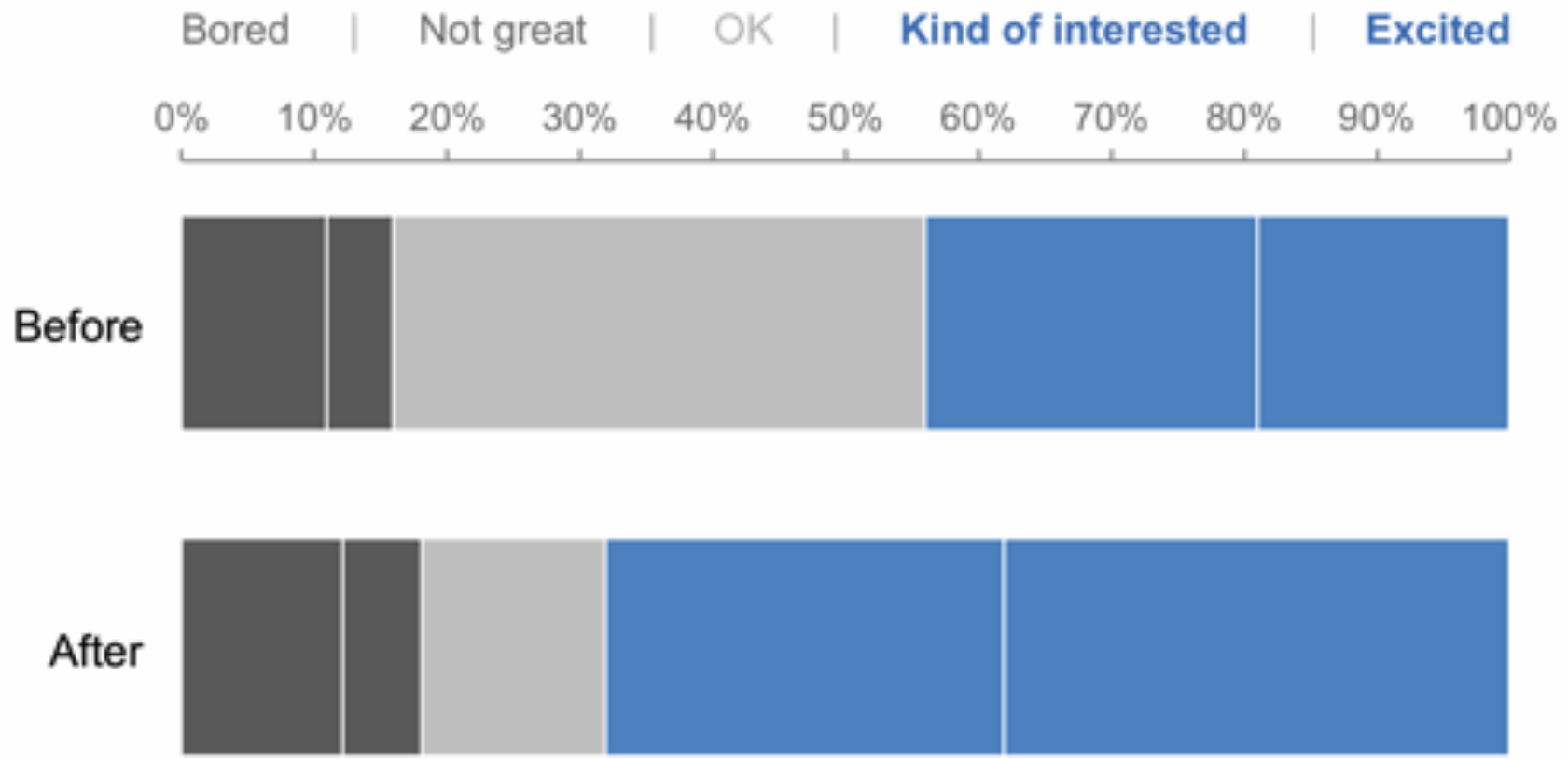
E.g., quantitative, time-series -> change over time

qualitative labels (often supplementary)

quantitative, two conditions -> compare

….

How do you feel about science?



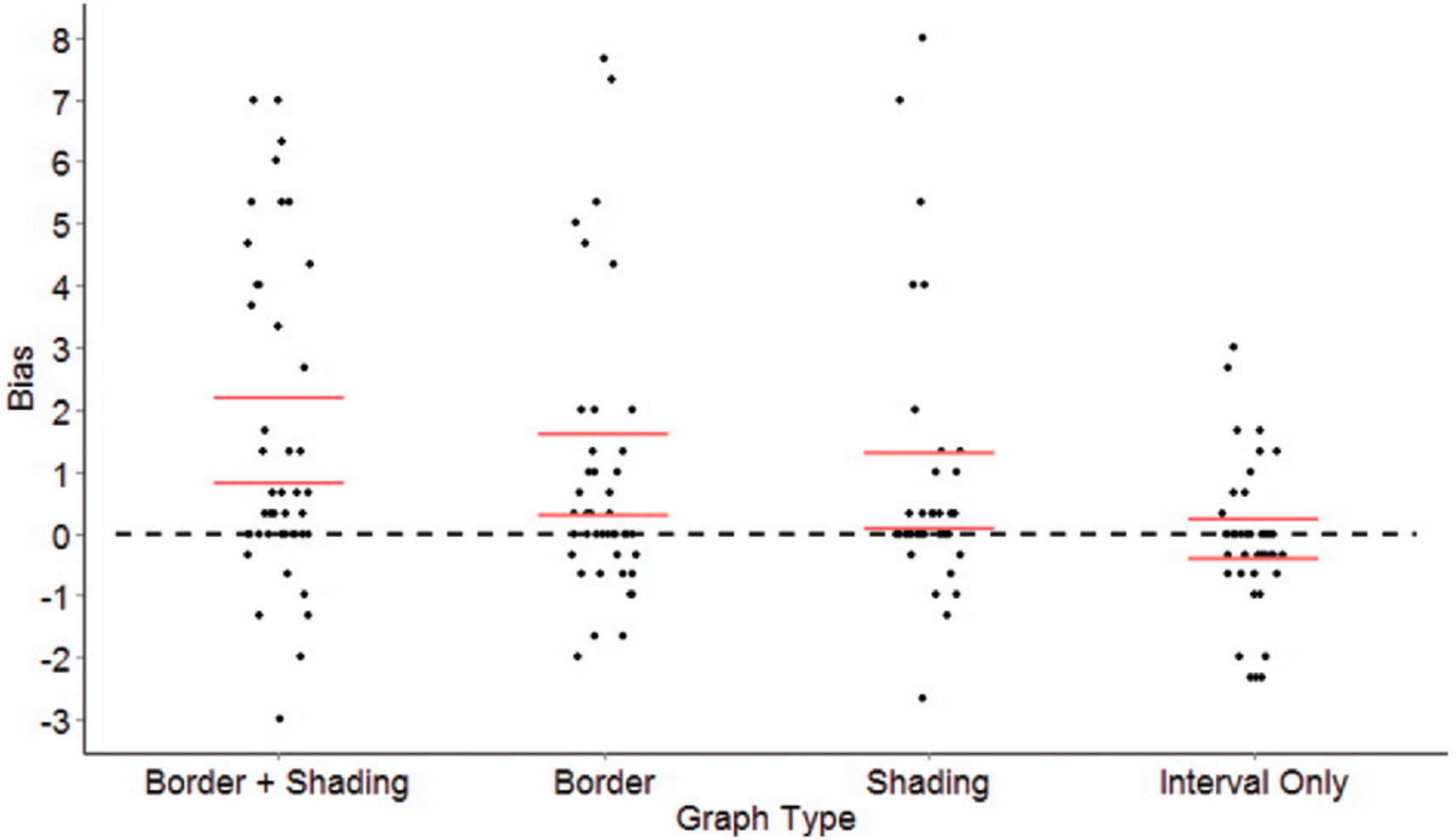
2. Identify Marks, Channels

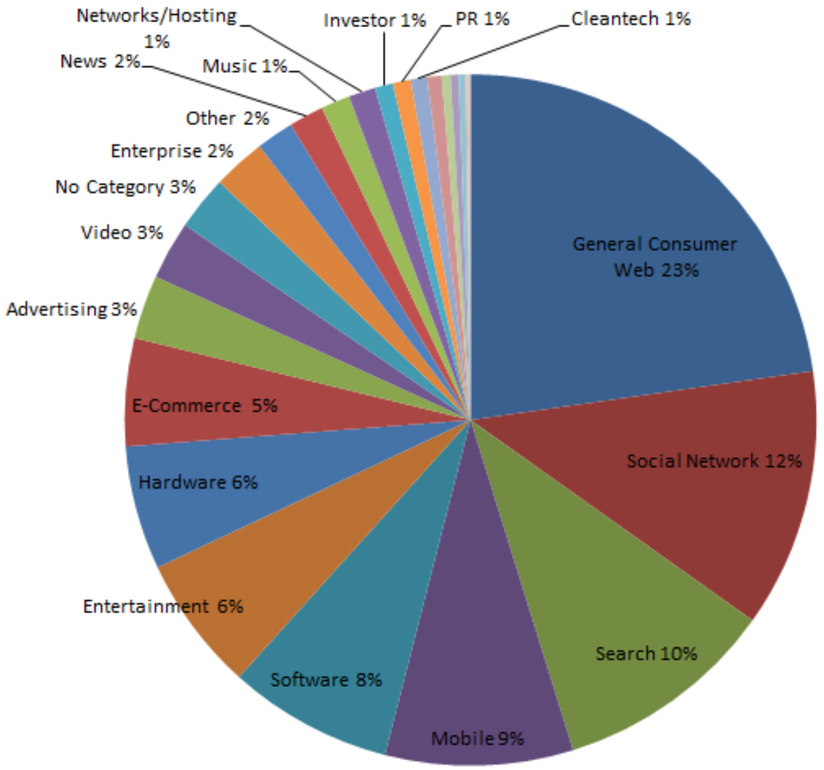
Mark: encodes “existence” of item

point, line, shape, …

Channels: encodes “magnitude of dimension associated with an item

positizion, size, saturation, color, …


8
7
6
5
4
3
2
1
0
-1
-2
-3
Bias
Border + Shading
Border
Shading
Interval Only
Graph Type

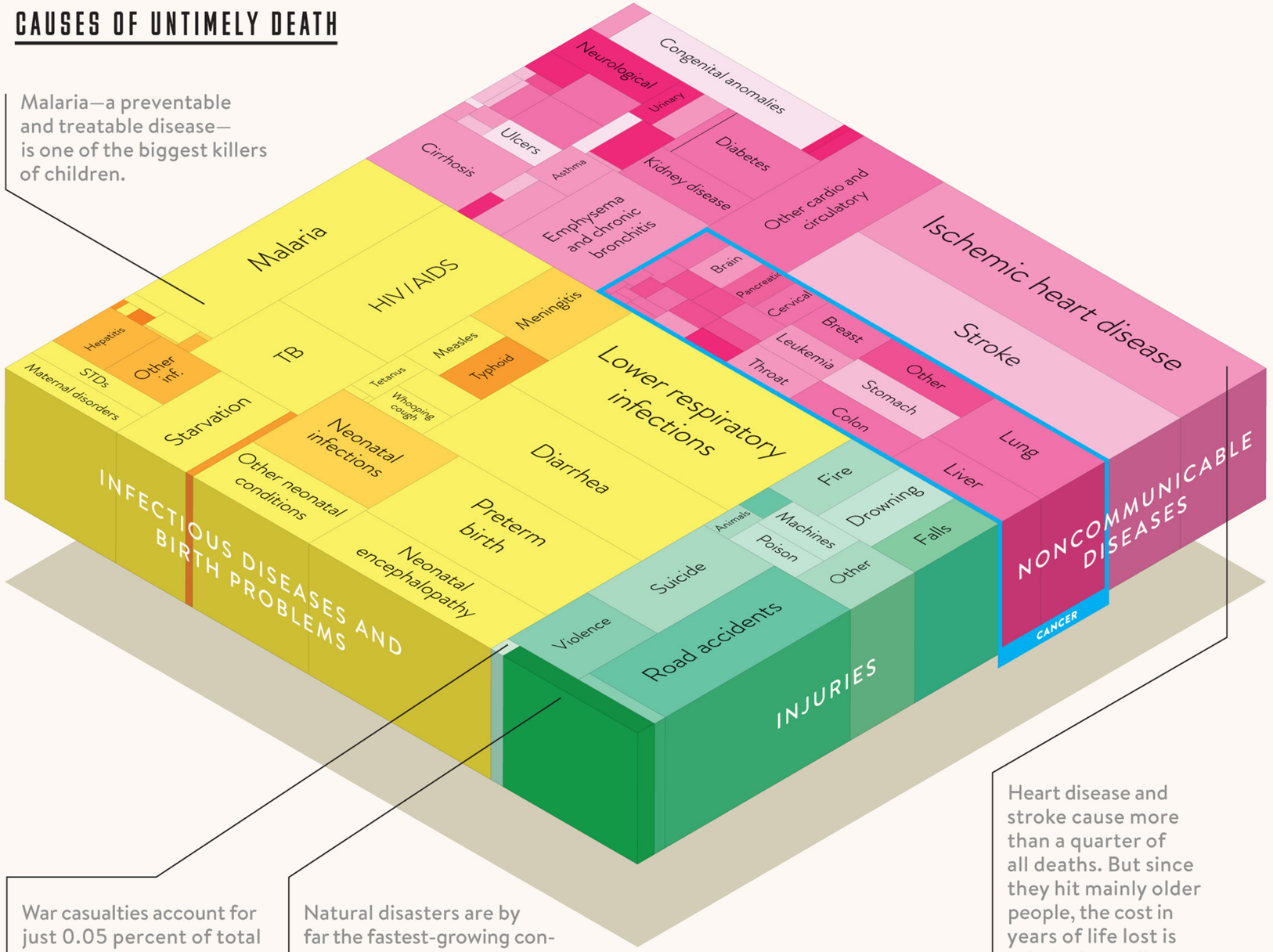


Share of coverage on TechCrunch

www.storytellingwithdata.com/2011/07/death-to-pie-charts.html

Cole Nussbaumer

CAUSES OF UNTIMELY DEATH



Malaria—a preventable and treatable disease—is one of the biggest killers of children.

War casualties account for just 0.05 percent of total life-years lost annually.

Natural disasters are by far the fastest-growing contributor to the death toll.

Heart disease and stroke cause more than a quarter of all deaths. But since they hit mainly older people, the cost in years of life lost is relatively small.

ANNUAL % CHANGE (2005 TO 2010)

INFECTIOUS DISEASES/BIRTH PROBLEMS

INJURIES

NONCOMMUNICABLE DISEASES

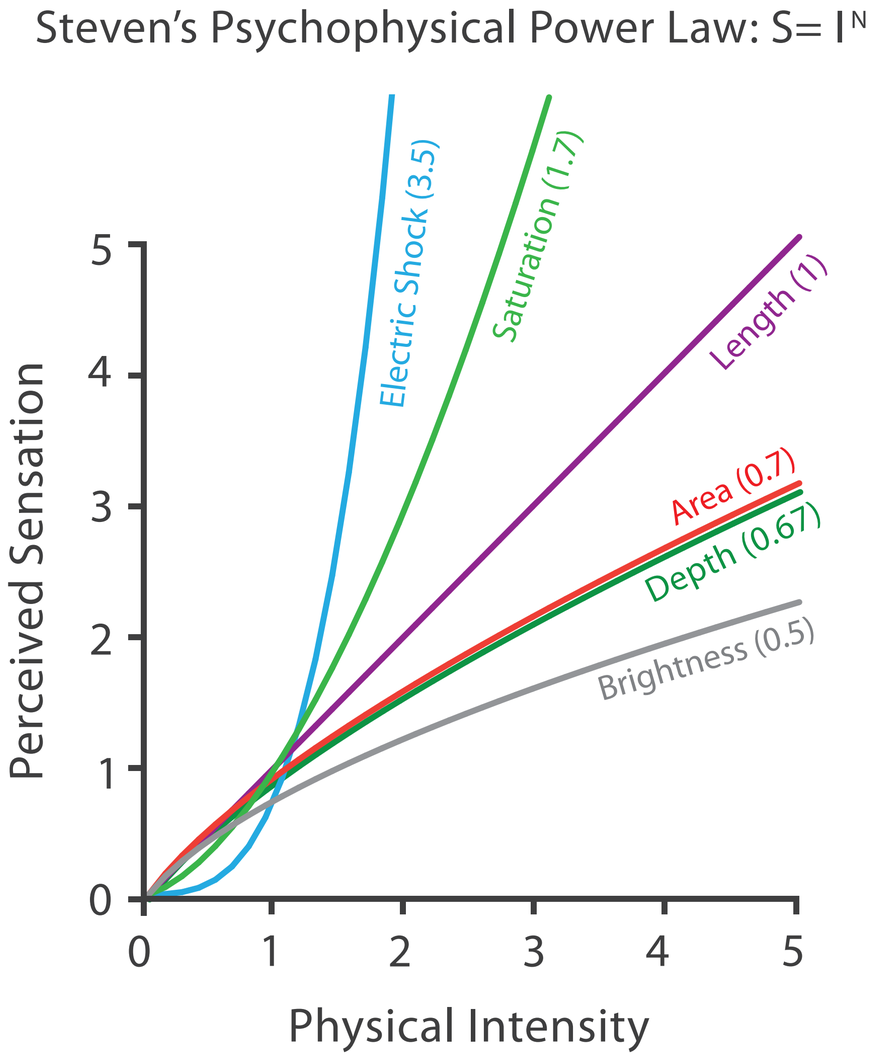
−3% −2% −1% 0% 1% 2% 3%

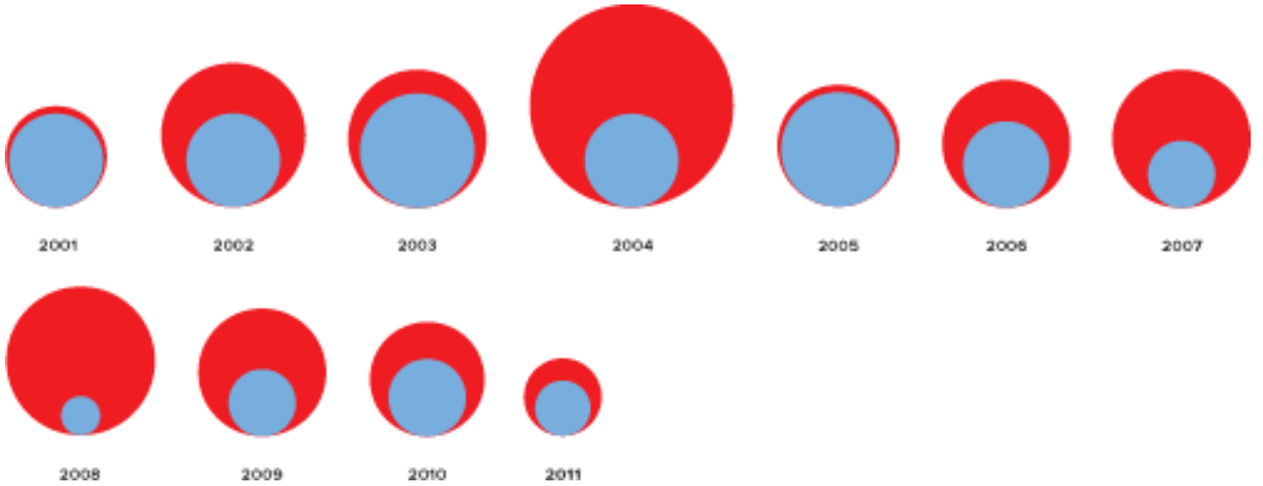
3. Is Effectiveness Principle Followed?

Use the Best Visual Channel Available

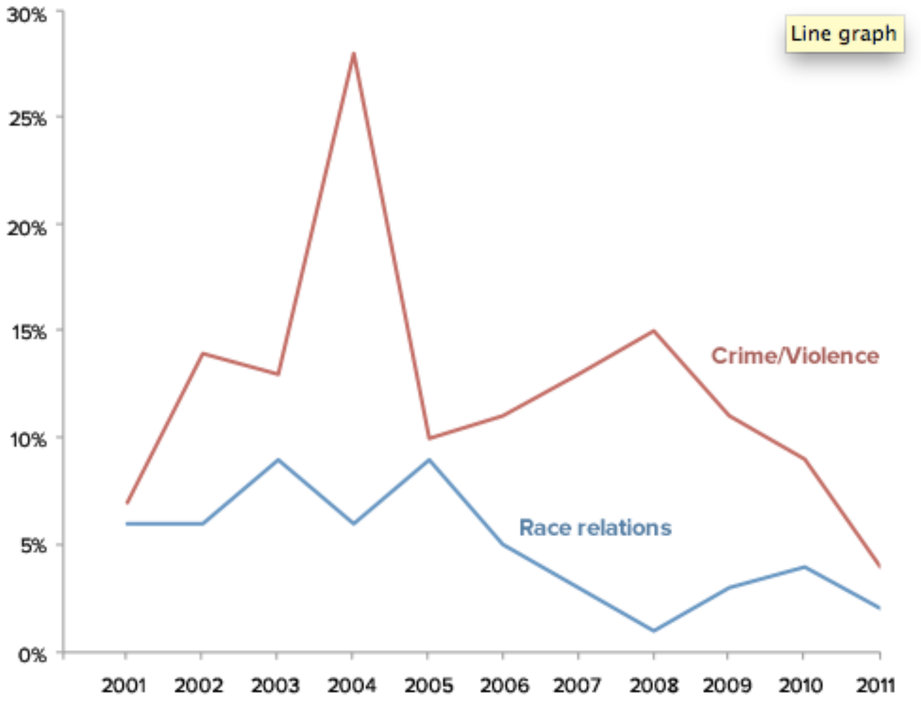
for the Most Important Aspect of your Data

Are all visual channels appropriate?





R. Cunliffe, Stats Chat



R. Cunliffe, Stats Chat

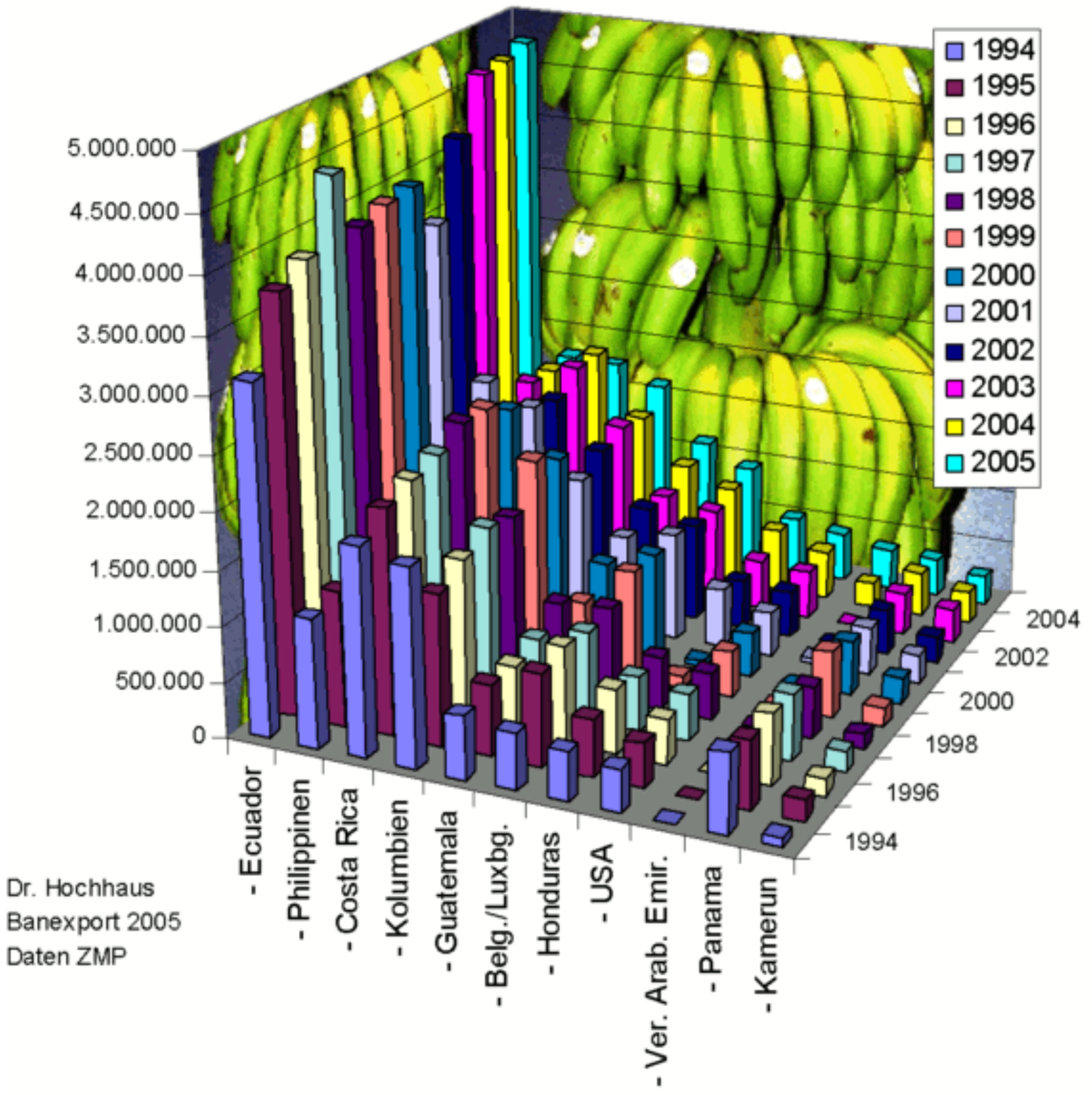
4. Is the Expressiveness Principle Followed?

The visualization should show all of the data,

and only the data

If there are violations, are they justified (useful chart junk)?

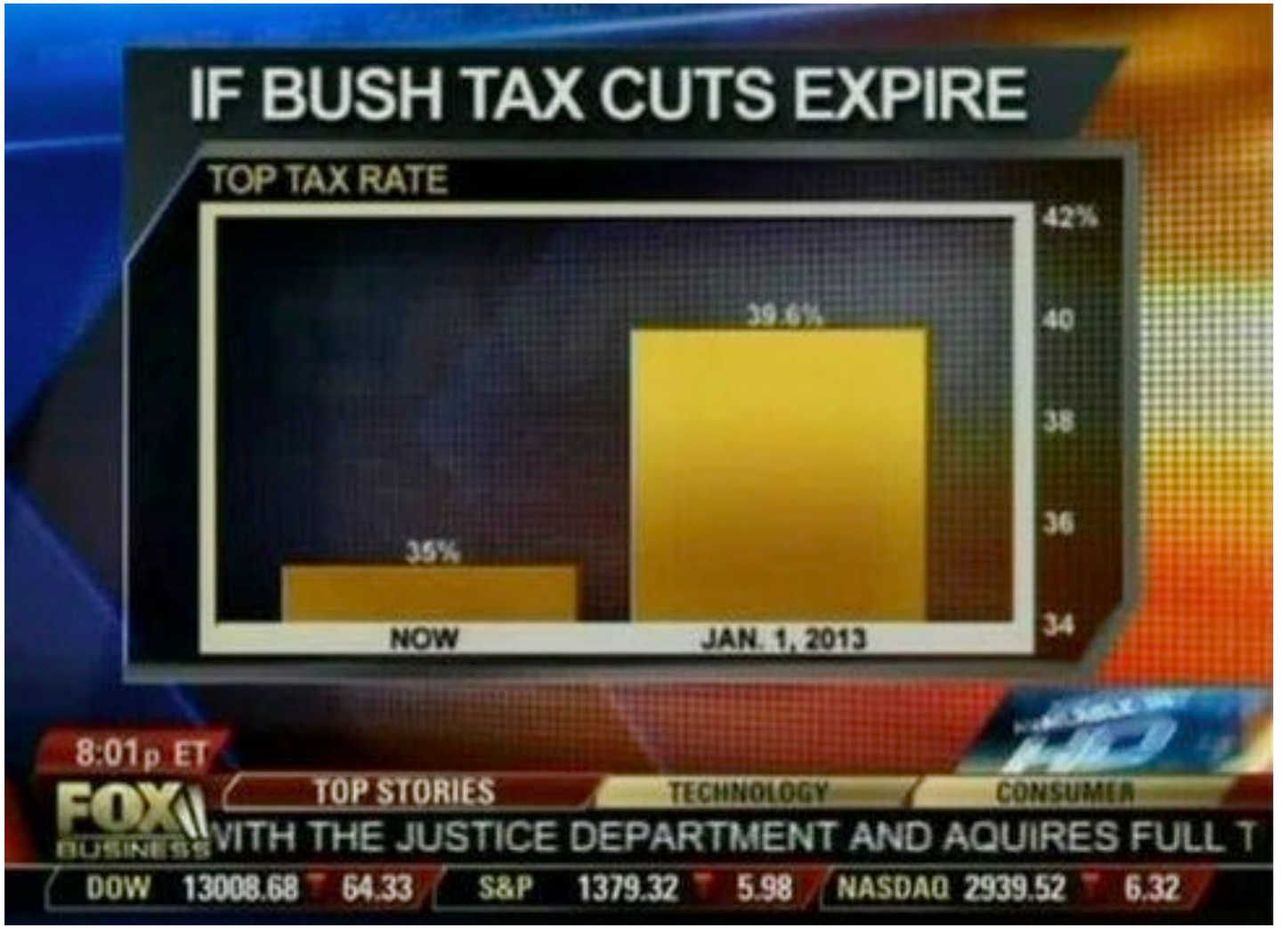
Export von Bananen in Tonnen von 1994-2005

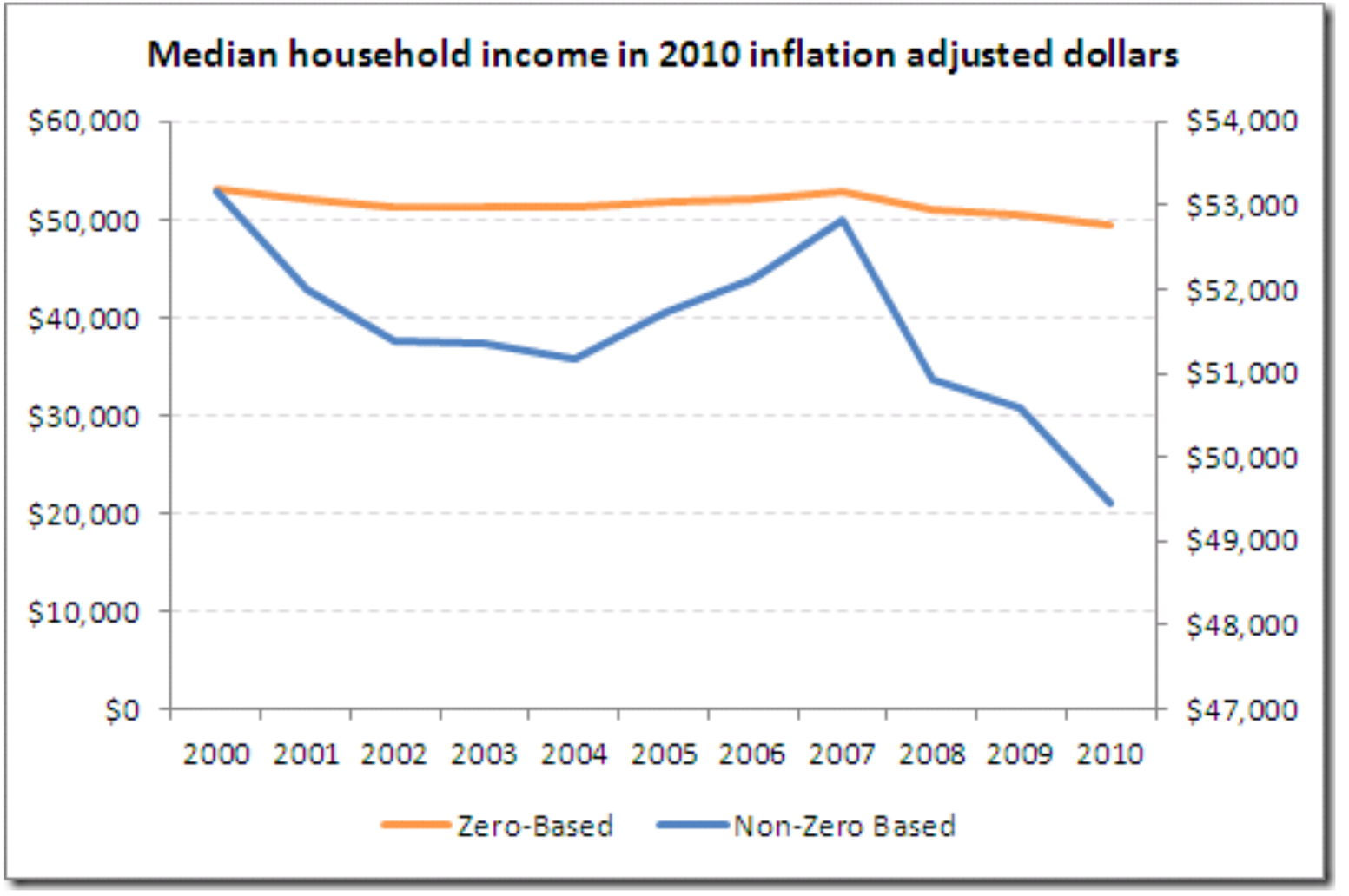


Dr. Hochhaus
Banexport 2005
Daten ZMP

5. Scales

Are the scales appropriate


IF BUSH TAX CUTS EXPIRE
TOP TAX RATE
42%
40
38
36
34
39.6%
35%
NOW
JAN. 1, 2013
8:01p ET
FOX BUSINESS
TOP STORIES
TECHNOLOGY
CONSUMER
VITH THE JUSTICE DEPARTMENT AND AQUIRES FULL T
DOW 13008.68 64.33
S&P 1379.32 5.98
NASDAQ 2939.52 6.32

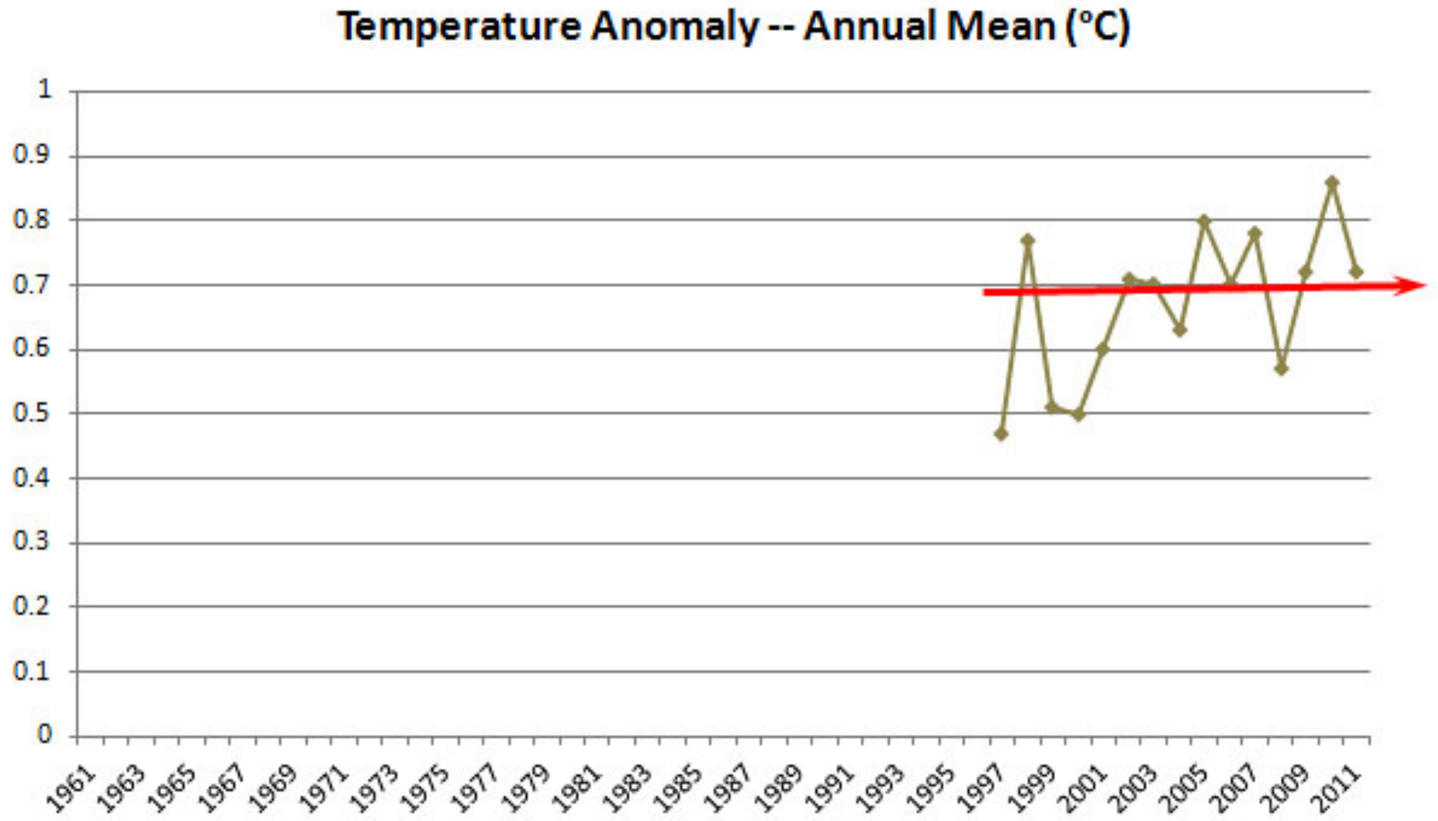


A. Kriebel, VizWiz

6. Context

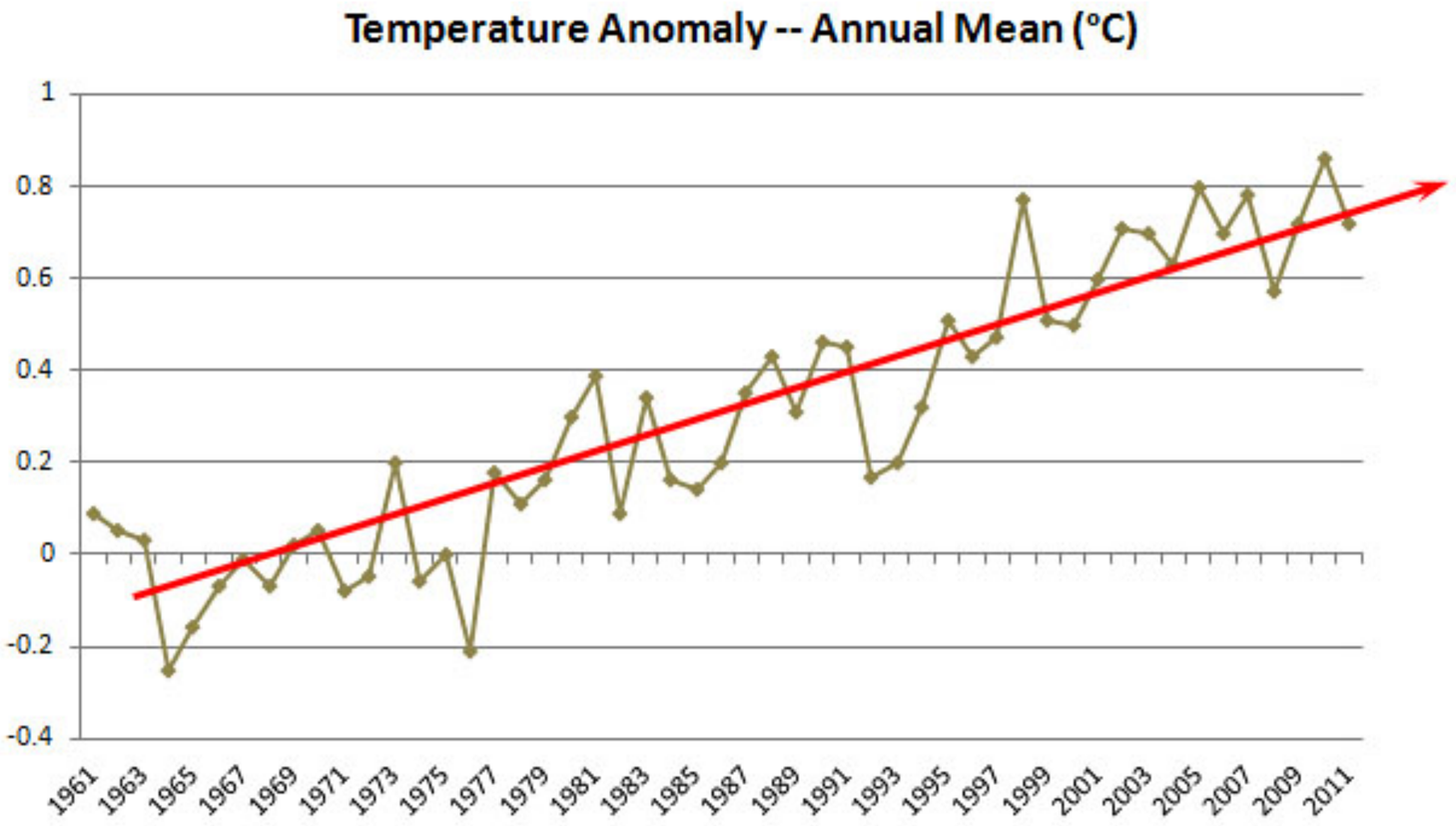
Is the data shown in the appropriate context

Global Warming?



Mother Jones

Global Warming - Frame the Data



Mother Jones

7. Would derived data be better?

E.g., show change instead of absolute values

Show distribution instead of data points

8. Other Guidelines

No Unjustified 3D

Time progresses linearly

Perception: color, colorblindness, shadows, etc.

Use of gestalt principles

Use of popout

Use of interaction / animation

Appropriate legends, labels