Effective Communication

Stacy Chang, Ziao Liu,
JD de Lorimier, Tim McGinley

Acknowledgement

1. Philip E. Bourne: Ten Simple Rules for Making Good Oral Presentations
2. Weixiong Zhang: Ten Simple Rules for Writing Research Papers
3. Nicolas P. Rougier: Tem Simple Rules for Better Figures
4. Professor Sanchez

10 Rules for Good Presentation

1. Know your audience

- Make eye contact with as many people as possible
- Prepare presentations that address the targeted audience
- Understand audience's background and knowledge level

2. Less is More

- Clear and concise presentation that leads to open-ended discussion
- Excess information may lead to:
  - Lost of main points
  - Presenter might talk too quickly to get all the information out there
  - Valuable question time may be sacrificed.

3. Only talk when needed

- Only discuss and present the information necessary for the presentation not uninteresting material
- Audience’s time is precious

4. Persistent take home message

- Audience should be able to recall the main points of the presentation after the presentation
- Emphasize the take away messages throughout the presentation

5. Be Logical

- Presentation is a story with:
  - Beginning
  - middle
  - End
- Set the stage in the *beginning*
- Tell the story in the *middle*
- Big finish in the *end*
- Take home message is clear

6. Treat the floor as the Stage

- Presentation should be entertaining and not boring, but presenters should understand the limit
- Captivate the audience

7. Practice/Time the presentation

- *Practice make Perfect*
- The more presenters practice, less likely for him or her to go off on tangents

8. Use Visuals

9. Review audio/video

- It is very effective to listen or view a presentation that you are presenting.

10. Acknowledgement

- Provide appropriate acknowledgement at the end of the presentation
- Acknowledge in the beginning of the presentation if necessary

Question:

What rules did I follow well (if any) during my presentation?

1. Know your audience
2. Less is more
3. Only talk when needed
4. Persistent take home message
5. Be logical
6. Treat the floor as a stage
7. Practice/Time your presentation
8. Use visuals
9. Review audio/video
10. Acknowledgement

(you get candy!)

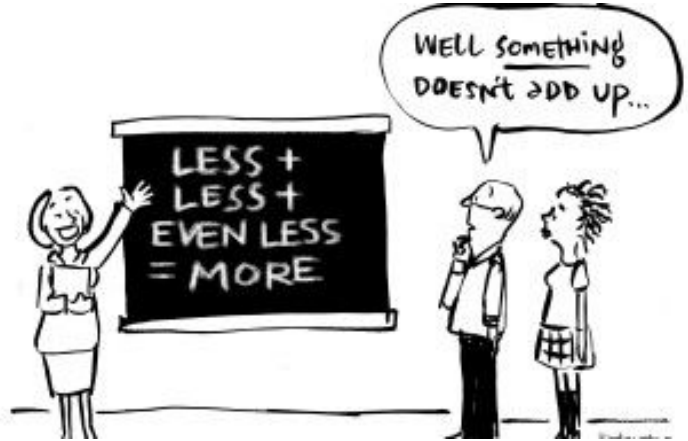
10 Rules for Writing a Research Paper

1. Make it a Driving Force

- Have a Concise Objective
- Don’t focus on the details
- Use writing as a method of honing argument

2. Less is More

- Density of knowledge
- Expand the field
- Authors are remembered for expertise



3. Pick the Right Audience

- How technical should you get in your analysis?
- Experts
- Laypeople
- Professionals from other disciplines

4. Be Logical

- Know where every thought is starting and ending
  - The reader should know this too
- Structure subsections to lead to big idea
- Use tables and visuals to help guide your “story”

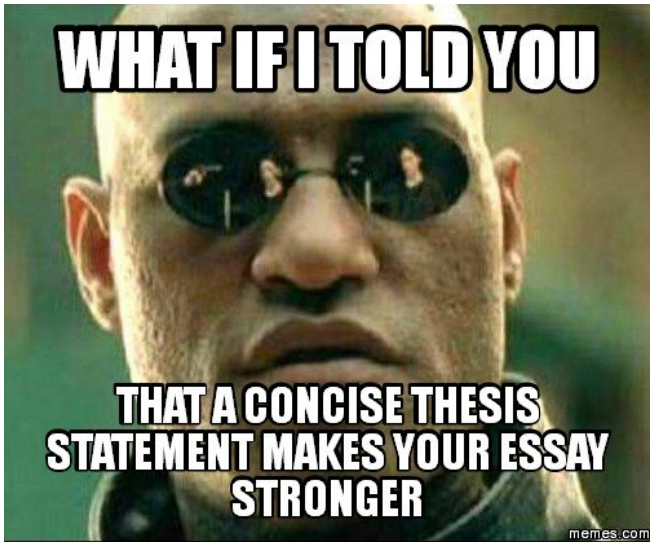
5. Be Thorough and Complete

Content and Presentation

1. Hypothesis must be supported with relevant data throughout the argument
2. Interpret and analyze results *not* just present
3. Make Sure the Paper is Self-Contained
4. Don’t make the readers do the arithmetic
5. Figures and tables are essential
    - ALSO must be self contained

6. Be Concise

- Being thorough is not an excuse to be verbose
- Keep the reader engaged

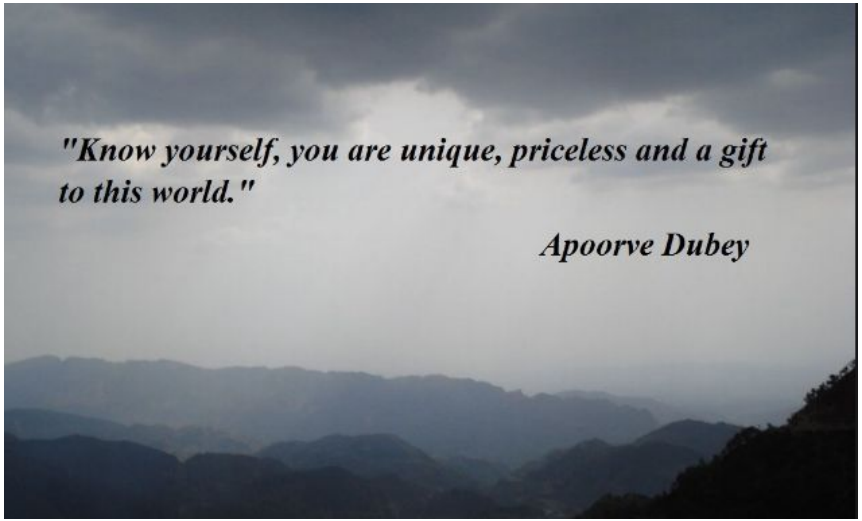


7. Be Artistic

- Reading the paper should be enjoyable
- Take pride in your work

8. Be Your Own Judge

- Take your time revising the paper
- You are very well versed in the subject
  - This can also be your downfall



9. Test the Waters in Your Own Backyard

- Ask your immediate peers to get feedback

10. Build a Virtual Team of Collaborators

- Writing a large paper can be personal
- Don’t get offended from honest feedback
- Use criticism to make your work stronger

1. Creating a driving Force
2. Less is More
3. Writing to an audience
4. Being Logical
5. Writing Thorough and Complete
6. Being concise
7. Writing Artistically
8. Judging your own work
9. Asking for peer assistance
10. Receiving feedback

Question:

Which of these do you find the most difficult?

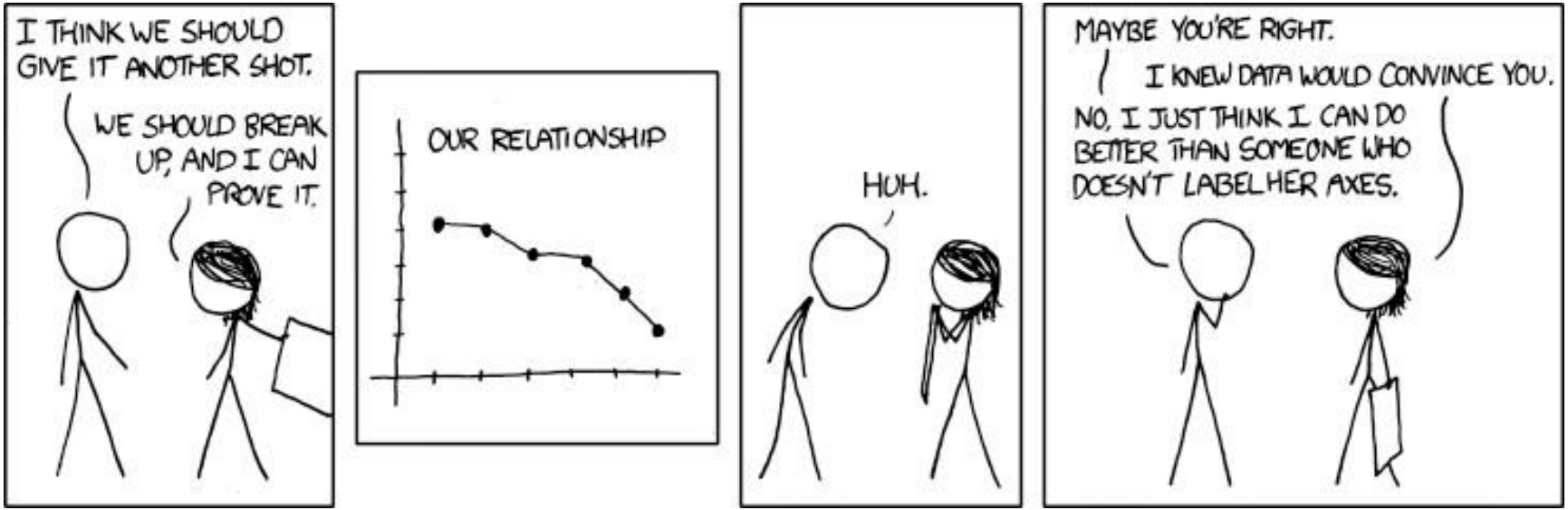
(you get candy!)

10 Rules for Better Figures

~~10~~ 11 Rules for Better Figures

1-4. Context Awareness

1. Know your audience.
    a. Old people? Make text large.
    b. Experts in the field? Some explanation probably not necessary
2. Know your message.
    a. Shape figure to clearly show what you are trying to represent- without distorting the facts
3. Know your medium.
    a. Slides? Better make important comparisons visually striking and simple.
    b. In depth research report on paper? Make it very information dense
4. Make sure to provide context using captions and labels
    a. Gives your audience context and reduces confusion
    b. Highlight key comparisons and important points for your message


I THINK WE SHOULD GIVE IT ANOTHER SHOT.
WE SHOULD BREAK UP, AND I CAN PROVE IT.
OUR RELATIONSHIP
HUH.
MAYBE YOU'RE RIGHT.
I KNEW DATA WOULD CONVINCE YOU.
NO, I JUST THINK I CAN DO BETTER THAN SOMEONE WHO DOESN'T LABEL HER AXES.

5-6. Effort and Creativity

5. Put in effort to create a plot specially suited to your message and data
    a. Plot defaults are not aware of context
    b. Might not be designed for the type of data or message

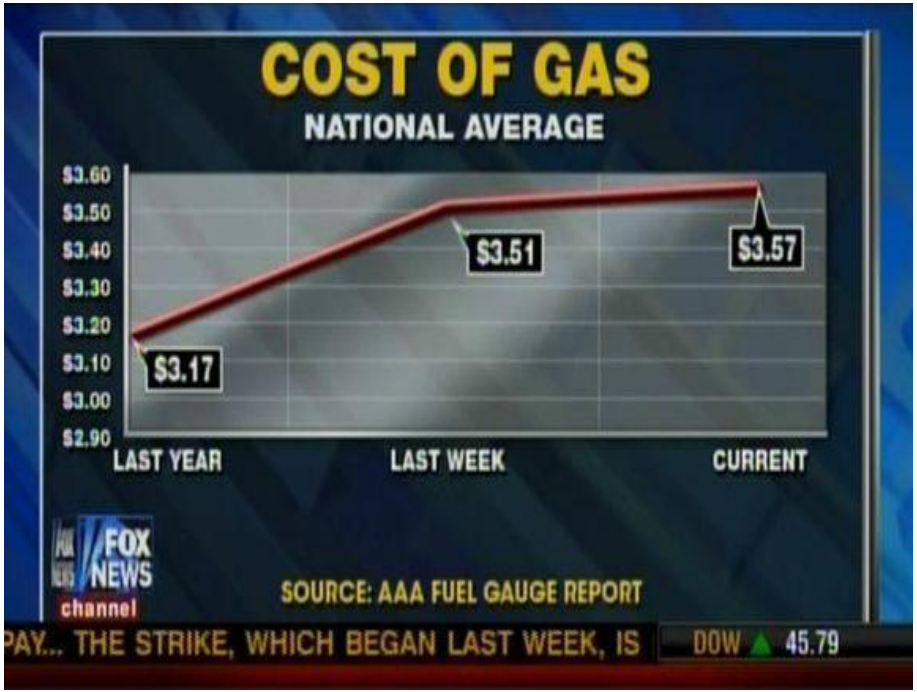
6. Use color effectively
    a. Allows humans to easily track and compare graph elements
    b. Use enough contrast to easily distinguish elements
    c. Use gradients for appropriate data (continuums, strength of variable i.e. red and blue states)
    d. Contributes massively to visual appeal of plot
        i. consider using palettes designed to look good together i.e. ColorBrewer

7. Do not mislead the viewer

Wait, no, not nearly emphatic enough...

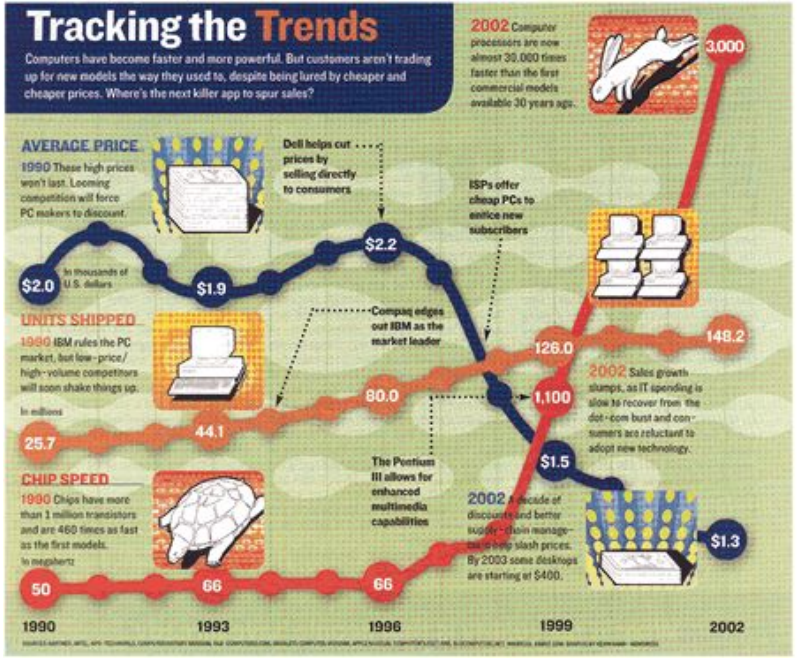
7. DO NOT MISLEAD THE VIEWER

- For example, setting axes ≠ zero
- Using values other than zero exaggerates changes
  - Often ostensibly to show minute changes
  - Often abused
- This chart makes it seem like gas prices have tripled...
- ...when in fact they increased 40¢, < 13%
- IN FACT: Just stating the dollar values would have been more effective!



8. Information density, aka avoiding chartjunk

- The ideal plot has no elements that do not contribute to the understanding of the data and message
    - Extra visual clutter distracts from points
- Simple, clear lines; short, effective labels and captions; color only used when needed
- Background images and graphics almost always unnecessary



9-10. Best Practices

9. Message trumps beauty
    a. First and only priority is to get message across
    b. Elements of plot that do not contribute to this are wasted effort, can even overcomplicate matters
    c. Even ‘important’ elements like axes units or tables can be distracting in specific situations, like a qualitative graph illustrating a concept

10. Use the right tools
    a. Probably R as we know how to use it effectively, infinitely extendible to do exactly what you need it to
    b. Other options include Matplotlib, Inkscape, TikZ, PGF, GIMP, and more
    c. Offer different levels and types of customization and ease

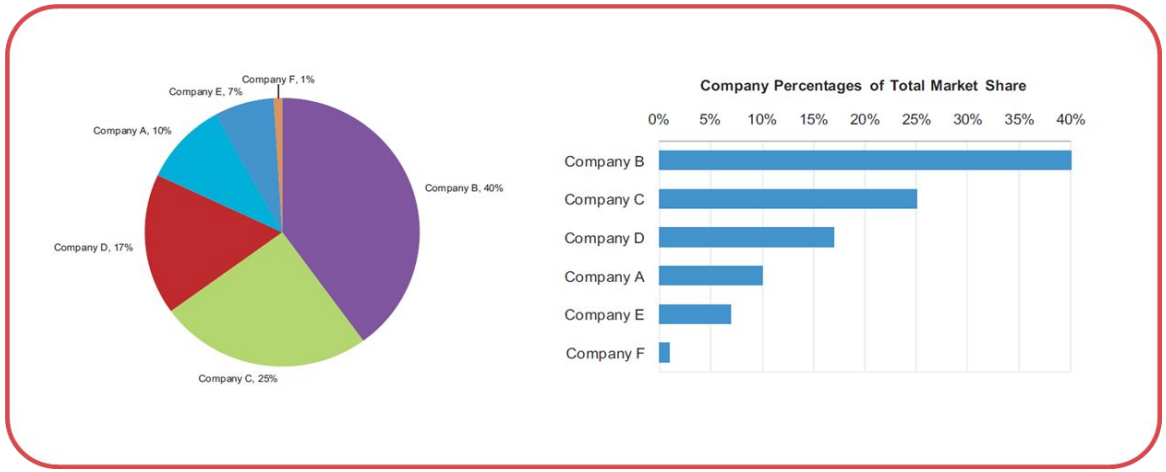
11. Avoid Ambiguous or Unclear Figures

- Allow easy comparison between observations and between variables
  - That's the point of graphics: easy representation that makes visual sense for humans
- Humans are really good at comparing lengths…
- … less so at areas. Incorporate this knowledge into your charts
  - Pretty easy to tell the difference between a 25% and 33% longer line
  - Pretty hard to tell the difference between 25% and 33% larger circle
- Following are a few specific recommendations

11. Avoid: Pie Charts

This is a statistics class at Cal – we're better than that

- Difficult to judge relative size accurately– especially when comparing changes across data
- Limited number of categories can be represented before loss of meaning

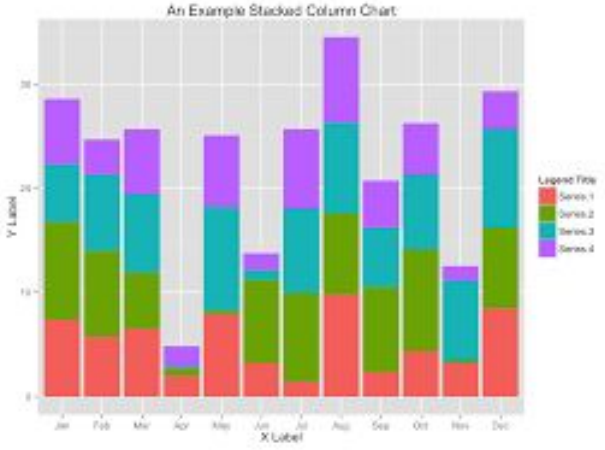


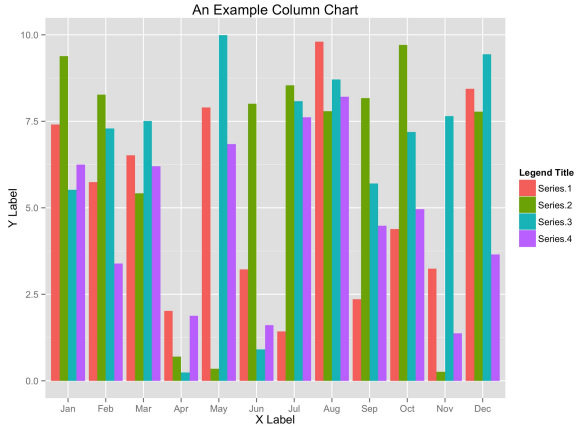
11. Avoid: Word Clouds

- What’re the two most common word in the document represented by this word cloud?
- Hint: America isn’t one of them
- It’s the text size (read: height of word) that is correlated with frequency, not total size
- Makes comparison between words of different lengths impossible
- Simple bar frequency chart is far more effective

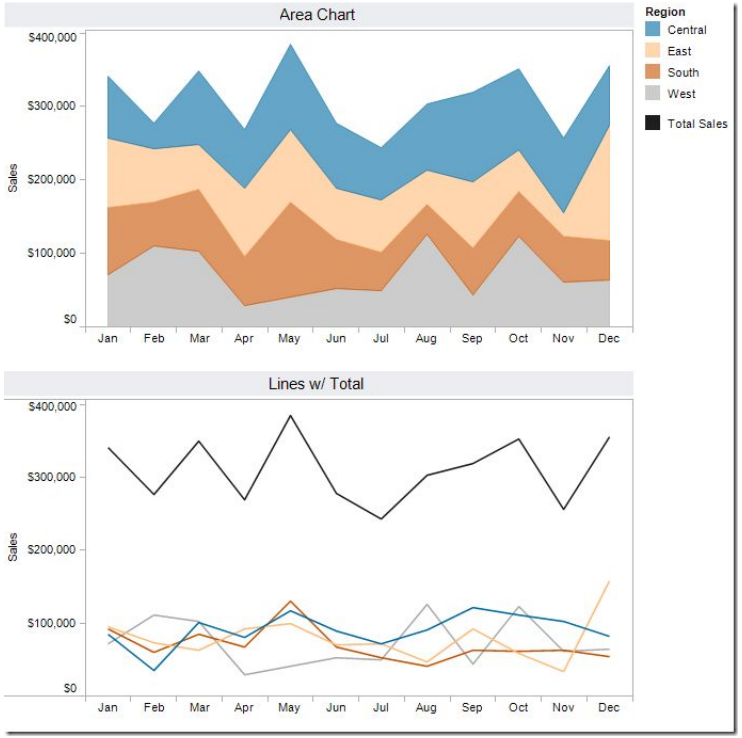
11. Avoid: Stacking the Baseline

- Difficult to see individual heights
- REALLY difficult to see changes of individual variables across observations
- Better: side-by-side barplots





11. Avoid: Stacking the Baseline



- Also applies to line charts
  - Same flaws- comparisons are really difficult
  - Between variables
  - Between observations
- Better: Line chart all on same scale, with additional line for total
  - Represents all data more clearly

Question:

What is your favorite type of plot and why?

(you get candy!)

(unless you say a pie chart)

Thank you (-:

Content Acknowledgment

Images:

http://www.fotosearch.com/clip-art/business-presentation.html

http://xkcd.com/833/

http://mediamatters.org/blog/2012/02/21/fox-still-struggling-with-basic-chart-concepts/185049

http://www.infovis-wiki.net/index.php?title=Chart_Junk

http://speakingppt.com/2013/03/18/why-tufte-is-flat-out-wrong-about-pie-charts/

http://www.usatoday.com/picture-gallery/news/politics/2014/01/28/what-did-obama-say-his-state-of-the-union-speeches-in-word-clouds/4966671/

http://www.yaksis.com/posts/r-chart-chooser.html

http://www.vizwiz.com/2012/10/stacked-area-chart-vs-line-chart-great.html