Scholarship Skills

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Lecture 18: Figures
Sources

Displaying Your Findings: A Practical Guide for Creating Figures, Posters, and Presentations
6e, 2010 now $11–$14 from Amazon

Practical, somewhat obvious, guidelines.

Elevating, beautiful, even spiritual, one of the great books of the 20th century — but can be hard to put into practice.
Explicit examples are more interesting and informative than vague examples.

The patient presents with a symptom, and the doctor must decide whether to order diagnostic tests, and whether to prescribe treatment.
Explicit examples are more interesting and informative than vague examples

The patient presents with a history of fainting, and the physician must help the patient to decide whether to undergo arrhythmia mapping (an invasive procedure), and whether to take antiarrhythmic drugs (which have unpleasant side effects).
Visualizations Work
What’s a Figure?

Any kind of graph, chart, plot, drawing, or photograph…
that is not a table, and is not running text.

Three parts to a figure:
1. Graph or graphic
2. Legend
3. Caption
Anatomy of a Figure

from Nicol & Pexman

**Figure X.** Main components of a figure.
General Guidelines for Figures

1. **Figure must be relevant to the paper**
   it should move the story along

2. **Image should be as simple as possible**

3. **Labels should be concise**

4. **Fonts in all figures should be consistent**

5. **Avoid color in figures for journal articles, conference proceedings, etc.**

6. **Specify units within the figure**

7. **Figures should stand alone**
   all information necessary to interpret the figure should be included in the caption.
Points to Watch

For a journal, figures may be reduced to fit the page

Are they still legible? Is the type size still appropriate?

Sans serif fonts scale better than serif fonts

Similar figures (within same article) have similar style

All text in same font style, and point sizes don’t vary by more than 40%.
Dazzle Camouflage

Are we moving left or back?

My eyes hurt real bad, sir!
Use shading carefully

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Lecture 19
Prefer Grayscale

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Lecture 19

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Make the figure easy to read

Avoid Bogus use of 3D
Put legend *in* the image, not next to the image
Or avoid legend by labeling the graph directly
Omit gridlines, or use a pale grey
Omit “walls”

![Graph 1](image1)
![Graph 2](image2)
1: Bar Charts

The value of the dependent variable is most frequently placed on the y-axis (vertical axis).

The y-axis to x-axis length ratio should be appropriate (e.g., the y-axis should be from two thirds to three quarters the length of the x-axis).

The top of each bar indicates the value for a particular group (e.g., women presented an average of 6.5 large hand gestures).

The independent variable is most often placed on the x-axis (horizontal axis).

Figure X. Average number of times different types of hand gestures were used by women ($n = 20$) and men ($n = 20$) when telling a joke over a 5-min period.

Although differences between the patterns used to identify the bars may be observable on the computer monitor, when printed they may be indistinguishable. The appearance of the shading can best be verified by checking a laser printout.

Color can be used instead of shading for overheads, multimedia, or poster presentations to differentiate the bars. Most books and journals do not print color.
Another version

In this version of the figure, the numerical values for the dependent variable are provided above the top of each bar.

The legend should be placed within the boundaries of the axes so that the figure requires as little reduction as possible.

Figure X. Average number of times different types of hand gestures were used by women (n = 20) and men (n = 20) when telling a joke over a 5-min period.

The larger space between the Women and Men bars and the shorter space on either end of the x-axis help readers visually group the bars.

Little or no space should separate bars grouped within one level of the independent variable (e.g., the four bars within Women). Large spaces would make the graph not only larger but more difficult to read.
## Adding graphics to a table

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Figure 1.5: A model of how programmers use conventional refactoring tools. Steps outlined in black are the focus of this thesis.
Don’t be afraid of data

Our eyes can take in more data than you might think!

Compare:

4 data points / in²
NY City Weather: 300 data points / in²
New York City’s Weather in 2003

Temperature
Bars represent range between the daily high and low. Average temperature for the year was 53.4°, making 2003 the coldest year since 1978.

Precipitation
Cumulative monthly precipitation in inches compared with normal monthly precipitation. Total precip...
Minard’s 1869 Map of Napoleon’s March on Moscow
Les Casques passent au galop le Némen, gelé.

TABLEAU GRAPHIQUE de la température en degrés du thermomètre de Ronne.
Data Integrity

A graphic does not distort if the visual representation of the data is consistent with the numerical representation.

This line, representing 18 miles/gal in 1978, is 0.6 in long.

This line, representing 27.5 miles/gal in 197, is 0.6 in long.