Designing Figures and Tables for Publication and Presentation

Tutor: Kali Tal, PhD (Research Support Services, University of Bern Medical Library)
1a. The Lie Factor

\[
\text{Lie Factor} = \frac{\text{size of effect shown in graphic}}{\text{size of effect in data}}
\]

“In practice almost all distortions involve overstating and Lie Factors of 2-5 are not uncommon.” (Edward Tufte)
1b. The Lie Factor: Distorting with accurate maps

Electoral votes for President, divided by party.

But “states” don’t vote. People do!

Popular votes for President, county by county

Areas that look small on a map can be densely populated
2a. The point is not to show your data. It is to show what your data **means**!

*Price decline (A&B)*

*Price convergence*

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From *Slide-ology*, by Nancy Duarte
2b. Graphs show *relationships* between values

Relationships that are invisible in tables...

are suddenly revealed when you choose the right graph!

Example from Stefan Fry
3a. Keep your data-to-ink ratio high!

Graphs show the relationship between values by giving them shape.

Don’t obscure the shapes by cluttering your graphs with non-data ink.

Example from Stefan Fry
3b. Even tables can be improved by keeping your data-ink ratio high

Push your key data to the front and let less important data recede

<table>
<thead>
<tr>
<th>Group</th>
<th>Metric A</th>
<th>Metric B</th>
<th>Metric C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>X.X</td>
<td>Y%</td>
<td>Z,ZZZ</td>
</tr>
<tr>
<td>Group 2</td>
<td>X.X</td>
<td>Y%</td>
<td>Z,ZZZ</td>
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<td>Group 3</td>
<td>X.X</td>
<td>Y%</td>
<td>Z,ZZZ</td>
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<td>Group 4</td>
<td>X.X</td>
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Example from Stefan Fry
4a: Perspective: where we stand determines what we see

Example from Nancy Duarte

A clear hierarchy...

becomes a collaboration if we shift perspective
4b. It’s hard to think around circles. Avoid pie charts like the plague

Example from Stefan Fry
5a. Color is data ink. Use it sparingly and with intent. More is not better.

There is no logic to the rainbow scale, so we can’t make intuitive sense of this graphic.

Varying saturation makes differences more visible than varying hue.
5b. Design for people with color-blindness (8% of men; .5% of women)

Choose a color palette that will work for people with and without color-blindness
5c. Don’t forget to recolor your photographic images!

Red-green color coding in an immunofluorescent image. (a) Conventional color coding is difficult for individuals with red-green color blindness (protanopia or deuteranopia) to discriminate. (b) Replacing red with magenta (top) or green with turquoise (bottom) improves visibility for such individuals. Nat Methods. 2011 Jun;8(6):441.
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