

..... quicktips

## DESIGNING AND REVISING VISUALS FOR QUANTITATIVE DATA

### Problem

Audiences who value quantitative evidence look for well-constructed tables and figures to communicate evidence and support claims. Unfortunately, many writers believe that numbers, tables, and charts are “just data,” missing opportunities to compose and revise visuals for force and clarity. Readers need clear data in context, provided in a form that is accessible and easily intelligible. Visuals can meet these needs, but not without the writer’s deliberate choices.

### Solutions

Writers can develop a greater awareness of what readers seek from visuals by asking themselves the following questions when developing and revising charts and graphs:

**WHAT INFORMATION WOULD I LIKE MY VISUAL TO COMMUNICATE?** Visuals are tools to represent data in ways that words can’t or text doesn’t. A visual’s purpose is not to decorate or reiterate; rather, its purpose is to demonstrate a form of analysis or synthesis. Different tools are appropriate for different jobs:

**Tables** display quantitative information organized into rows and columns so that a reader can easily scan a set of individual values to find relevant information. When a writer wants readers to see a complete range of individual values, a table can display all that information.

**Figures** also display quantitative information, but aggregate and synthesize it to tell a particular visual story. When a writer wants to describe change over time, or show the composition of a whole, charts or graphs, for example, can allow readers to more easily see the point.

For more advice, along with visual examples of tables and figures, please visit <http://bit.ly/BatesTablesFigures>

### WHAT DOES THE FIELD OR DISCIPLINE THAT I’M WRITING FOR VALUE IN VISUALS?

Published research in your field will provide the best models; in addition, you can find detailed instructions and conventions (including expectations for titles, captions, legends, and citations) in your field’s most commonly used style manual:

**ACS** (American Chemical Society), 3rd ed.: chapter 15 (Tables) and chapter 16 (Figures)

**AMA** (American Medical Association), 10th ed.: chapter 4 (Visual Presentation of Data)

**APA** (American Psychological Association), 6th ed.: chapter 5 (Displaying Results)

**Chicago**, 15th ed.: chapter 12 (Illustrations and Captions) and chapter 13 (Tables)

**IEEE** (Institute of Electrical and Electronics Engineers), 2014 ed.: sections 13 (Tables) and 14 (Figures)

**WHAT IMPROVEMENTS CAN I MAKE TO MY EXISTING VISUALS?** Like any type of writing, visuals and graphics require revision. To assist in the process, consider these questions, adapted from Hall and Menefee-Libey (2015):

**How does the graphic contribute to the presentation of results?**

(In other words, is the graphic necessary? What is it doing that text can't do?)

**How does the selection of the graphic fit the methods and results?**

(Is it appropriate?)

**Can you infer its meaning without reading the text?**

(Is it independently legible?)

**Does the graphic faithfully represent the data?**

(Is it accurate and truthful?)

**Does the graphic include all of the expected components (labels, captions, etc)?**

(Does it follow expected conventions?)

- Do your visuals have titles and captions?
- Are multiple visuals numbered sequentially?
- Are the axes labeled clearly, with standard units?
- Is the scale evident and consistent?
- Are legends and other explanatory material (notes, asterisks, etc.) easy to find?
- Is the graphic cited appropriately and according to the conventions of your discipline?
  - If the graphic is from a source, have you given credit to the original author(s)? (See style manuals above for discipline-specific conventions.)
  - If you constructed the graphic yourself, have you indicated the source of its data?

**Are the style and design choices effective?**

(Is it uncluttered?)

- Does the ratio of white space to “ink” allow the reader to focus on what is important?
- Can anything be removed without affecting meaning (e.g., unnecessary gridlines)?
- If colors are used, are they necessary and consistent?
- Are data points in your plot or chart easy to tell apart?

**Is the graphic accessible to diverse audiences?**

- Have you included textual descriptions of visualizations?
- Have you ensured legibility through contrasting lines, shapes, or values?
- Have you performed a grayscale test to ensure that your visual is accessible to people with color blindness?

For excellent advice on charts and accessibility, visit [accessibility.psu.edu/images/charts/](http://accessibility.psu.edu/images/charts/)

**References**

Hall, S., and Menefee-Libey, W. (2015, October.) *Tutoring STEM Writers: Approaching Visual Rhetoric*. Materials presented at the International Writing Centers Association conference, Pittsburgh, PA.

**For more information:**

The Writing Center, University of North Carolina at Chapel Hill (2016). *Figures and charts*. Retrieved from <http://writingcenter.unc.edu/handouts/figures-and-charts/>