

◆ *Tables and Graphs: The Good, the Bad, and the Ugly*

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Visual representations of technical information can greatly enhance a text, but only if well designed. In this interactive session, speakers Tom Lang and Jessica Ancker summarized some of the research findings related to tables, charts, and graphs. They then offered tips on how to design tables and graphs that communicate well and asked attendees to think of improvements for several faulty graphs and tables.

Tables

The discussion of tables began with Lang's observation that "tables are often used for 'passive data storage' rather than to actively communicate information." The editor's task is to help readers of tables attend to the most important information.

Knowing how people read tables could help editors design tables that communicate effectively. For example, two values side by side in adjacent columns will be compared by readers—whether or not they

should be—so related information should be presented together, and unrelated information should be separated.

Research also indicates that readers enter a table through the column and row headings and then move to the data field. Therefore, Lang stressed the importance of using clear headings with familiar terms. And table titles should describe the data field and not simply restate the column and row headings.

Another common problem with tables, Lang said, is maintaining data integrity. A column or row heading should apply to all information presented in the row or column. Lang also recommended including columns or rows for confidence levels, perhaps for totals, and for other information necessary to interpret the data accurately. To help readers attend to the most important information, Lang suggested highlighting the cells in the table that contain this information.

Charts and Graphs

Of the graphics used in medical journals, the bar chart is most common. However, the fact that a simple bar chart is a default form in most Microsoft software does not mean it is always the best way to present information, according to Ancker. Editors should consider a wider range of options—such as a box plot, dot plot, or line graph—when information is to be presented graphically.

Ancker also commented on another Microsoft default—the pie chart. This overused graphic does not typically com-

municate well, she said, because human brains have trouble comparing areas and angles. A pie chart that is tilted to give a three-dimensional effect is especially troublesome because areas on the back of the chart cannot be compared visually with areas toward the front.

Regardless of the type of chart or graph used, editors should consider the amount of information conveyed by a set amount of space or ink—the graphic's "data density". Finding ways to consolidate information and simplify images can save readers' time and more.

A Choice

Choosing an appropriate type of chart or graph influences how readers interpret data. To demonstrate that point, Ancker walked attendees through a study showing that physicians' judgment was affected by how data were presented (Elting LS et al. *BMJ*. 1999;318:1527-31). Physicians were asked whether, on the basis of data presented in one of several types of tables or charts, a clinical trial should continue. Although participants expressed a preference for the bar chart, responses were more accurate for icons or tables.

Finally, the effectiveness of a display depends largely on the communication goals of the graphic—what should be compared—and how well the graphic emphasizes it. "One of the ways we can make our readers more intelligent is to help them to attend to the right things", Lang said. "We want to focus readers' attention where it will do the most good." 