

# Book Review

**Envisioning Information by Edward R. Tufte (*Graphics Press 1990*)  
126pp., ISBN: 9780961392116, \$40.00 (hardcover)**

Reviewed by Jackie O'Neil

## *The Art of Quantitative Scientific Graphics*

Visual representations of data are fundamental pillars of communicating scientific information. The thoughtful and careful visualization of data and trends can have a powerful effect when appropriately used. Some of the greatest visual representations were compiled over a hundred years ago and continue to be efficacious at communicating information rapidly and without confusion. From the elementary periodic table to the more complex table of nuclides, these powerful depictions provide shining examples of a way to quickly and unambiguously convey otherwise complicated information.

In the world of default tables and charts provided by PowerPoint and Excel, paired with tight timelines in both the academic and industrial sectors, it is all too often that quantitative data become muddled in a series of visually confusing tables or buried among ineffective graphics. As a researcher who is responsible for gathering, analyzing and communicating quantitative data, I continually try to improve my methods of creating more effective visual aids. In my quest to do so, I came across a book “*Envisioning Information*” authored by Edward R. Tufte, a celebrated statistician who is noted for his work on informational graphics.<sup>1</sup>

Tufte impressively describes effective systems that many scientists use frequently, such as small multiples, layering, and micro/macro readings. It was intriguing to see the explanation of how these types of visual comparisons guide our brains to observe patterns and draw conclusions based on creatively arranged visuals. But just as one can create a powerful graphic of complex quantitative data, there are many things that can disrupt the flow of information and render even simplistic data sets confusing to the audience. Developing an understanding of how these systems function allows the researcher to consider these ideas when analyzing and communicating complex data.

Today's scientific achievements are often described by multi-variable systems that basic scatter plots, bar graphs and/or histograms struggle to represent. Only with a creative and thoughtful approach can one begin to honor the beauty of the informational systems they portray. One of the most helpful themes for me was the importance of emphasizing the quantitative information itself while reducing the clutter that is startlingly accumulated in the act of organizing information. The third chapter highlights how combining two visuals can sometimes add a layer of information, referred to the  $1+1=3$  effect, an idea originally described by Josef Albers in 1969.<sup>2</sup>

Simple tricks, such as removing the visually-obstructive default thick black borders on figures and tables, and using transparent spacing between visuals that are intended for direct comparison, are discussed in this book, to give scientists and data collectors alike tools that can immediately help improve their own graphics. With its minimalistic text and emphasis of the subconscious visual experience for the audience, this book clearly demonstrates that a few simple key guidelines can have a lasting impact on the quality and effectiveness of how quantitative information is visually conveyed and ultimately understood by the audience.

1. Tufte, Edward R. *Envisioning Information*; Graphics Press LLC: Cheshire, Connecticut, 1990.
2. Albers, Josef. "One Plus One Equals Three or More: Factual Facts and Actual Facts" in Albers, *Search Versus Re-Search*: Hartford, 1969; pp. 17-18.