Book Review

Cairo, A. (2016). The truthful art: Data, charts, and maps for communication. New Riders. (400 pp., paper $49.99, e-book $39.99).

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The Truthful Art: Data, Charts, and Maps for Communication (2016), Alberto Cairo's follow up to his 2012 book, *The Functional Art*, is an aesthetically-pleasing and timely work aimed at improving the quality and effectiveness of visualizations within the framework of truthfulness and design. Cairo, a journalist, faculty member, and director of the University of Miami's Visualization Program in their Center for Computational Science, frames his examples within journalism and marketing. The book provides examples that Communication Center staff can use to demonstrate to students how visuals might be made more appealing, more effective and/or more accurate. Also useful are Cairo's illustrations of the ways in which an omission in a graphic can lead to skewed results.

The text consists of four parts. Part I, Foundations, defines terms and provides a five-part definition of visualization. Part II, Truthful, delves into the ethics of visualization and the use of data. The bulk of the text, Part III, Functional, describes various chart types and their uses while also providing information on appropriate statistical analyses to tell an accurate story. Part IV, Practice, is a short chapter that Cairo plans to develop into a stand-alone book. This chapter showcases visualizations that Cairo believes are journalistic models, and it reviews the ways that technology is changing the ways that designers create visualizations, from charts that adapt to mobile devices to interactive charts such as those that model rising sea levels (p. 343).

Parts I and II are familiar to anyone with a background in rhetoric: good rhetoric is truthful. Cairo applies that to visualizations, an ever-growing area of media. Visualization is balanced atop three requirements: ethics, aesthetics, and rhetorical effectiveness (p. 15). For Cairo, removing even one of these aspects diminishes the quality of the visualization. As such, Cairo takes a data-first approach to graphics: good graphics tell a story by presenting accurate data, and the data should determine the story (p. 15). Cairo not only addresses creators of visualizations, but audience members, too, asking that they understand how visualizations can skew and/or omit data.

Cairo then gets to the thesis of his book: for a visualization to be effective, it should be truthful, functional, beautiful, insightful, and enlightening, and if one of those qualities is missing, the effectiveness of the visualization diminishes. Throughout the text, Cairo provides examples of visualizations from across disciplines and from different countries, demonstrating the universality of visualization and highlighting the five tenets of visualization. In some instances, Cairo juxtaposes visualizations with his own creations to demonstrate how a visual representation can be made more effective and truthful.

Part III of the text examines the functions of data: distribution, visualizing change, relationships, mapping, and the

portrayal of uncertainty and statistical significance. This portion of the text provides technical instruction to readers interested in creating visualizations. It is in this part of the text that Cairo instructs on the purposes of different chart types as well as the drawbacks and misleading characteristics of various visualizations. For instance, in the chapter on distribution, Cairo demonstrates how a visualization of low cancer death rates tells only part of a story and can be skewed by sample size (p. 184). For nearly every chart type that he details, Cairo also provides drawbacks and additional considerations for understanding data.

Part IV of the text is not as satisfying as the rest of the book as the same thought, depth, and explanation demonstrated in the rest of the book is not present. Cairo explains in the epilogue that the third book in the series, *The Insightful Art*, will be out in 2019 and will further address the topics in Part IV, including visual design, copy, storytelling, mobile platforms, and animation.

Cairo indicates that his intended audience is journalists and those in marketing, though he also addresses journalism audiences, stating the audience must be vigilant consumers of media. His primary audience, though, are those in journalism who want to learn more and better reach their audience, as in his epilogue he states, "the audience I have in mind is myself a decade ago" (p. 375). However, the content of the book is applicable to anyone who works with data and wants to create effective visualizations.

The Truthful Art positions itself uniquely within the field of data visualization. The text can be compared with Cole Nussbaumer Knaflic's popular and insightful book, *Storytelling with Data* (2015), though Cairo's book provides more depth and technical guidance than Knaflic's

text and also addresses the shortcomings of various visualizations in a way that can help the reader understand ethical obligations when designing visualizations. Additionally, Cairo's work is more accessible to a beginner than the works of data visualization expert Stephen Few.

The greatest value in the text may be the approach Cairo takes with tone, vocabulary, and references. Embedded within the text are bits of humor and quotidian examples that are familiar to those without a statistics and/or design background. In areas where he discusses technical aspects, such as the chapter titled "Uncertainty and Significance," Cairo bolds new terms, provides a definition, and refers the reader to previous sections (pp. 299-325). The footnotes and credits within the book are extensive, with Cairo giving credit not only to the designers of the visualizations that he uses, but also providing readers with resources to further their depths of understanding.

Perhaps secondary to the content are the aesthetics the book presents. It is significant that Cairo's examples are from journalism and marketing and not academia, as both journalism and marketing are industries in which rhetorical appeal is concerned with aesthetics. There have long been calls to make academic work more accessible to general audiences, and perhaps one place to start is with appealing visualizations that are truthful, functional, beautiful, insightful, and enlightening. As such, this text would be an effective addition to graduate-level research methods courses and a resource for those in academia who are interested in creating more impactful visualizations that are accessible to wider audiences. Digital supplements to the book, including video lectures, are available on Cairo's website, thefunctionalart.com.

References

Knaflic, C. N. (2015). *Storytelling with data: A data visualization guide for business professionals*. Hoboken, NJ: Wiley.