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REVIEW / RECENZJA

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Introduction

In 2013, Bret Victor, an interface designer and computer scientist, addressed Stanford students, stating:

> We all understand the expressiveness of language [...] but, I think, we culturally don't really understand the expressiveness of information pictures. [...] Many people think: how many types of visualisations are there? Like four, right? And it's kind of a meaningless question. How many types of visualisation there are is like asking how many pictures there are; how many sentences can there be in the world? Every idea can have its unique sentence, every thought can have its unique picture (Drawing Dynamic Visualizations 2015).

Since 2013, the landscape of visualization has transformed significantly. It is no longer an exclusive domain reserved for the chosen few; today, anyone can communicate through visualized information and data using accessible tools like Canva. Yet, Victor's questions and insights remain pertinent. Have we truly developed the skill to use this form of communication effectively? More importantly, do we recognize its persuasive potential?

In this review, I will discuss two books published in the AK Peters Visualization Series. Neither book explicitly mentions the term "rhetoric," but in my view, they should be of interest to rhetoricians. They fundamentally revolve around the art of convincing others in the public sphere.

The juxtaposition of Nancy Organ's *Data Visualization for People of All Ages* and Jen Christiansen's *Building Science Graphics: An Illustrated Guide to Communicating Science Through Diagrams and Visualizations* may come as a surprise.

Typically, one might expect a review to highlight similarities, but here, I choose to place these books side by side for their contrasting perspectives.

Before delving into the essence of the comparisons, it is important to recall the mission of the AK Peters Visualization Series. This series

> aims to capture what visualization is today in all its variety and diversity, giving voice to researchers, practitioners, designers, and enthusiasts. It encompasses books from all subfields of visualization, including visual analytics, information visualization, scientific visualization, data journalism, infographics, and their connection to adjacent areas such as text analysis, digital humanities, data art, or augmented and virtual reality ("AK Peters Visualization Series," n.d.).

Both authors are practitioners who bring their expertise in communicating through visualized information and data. Jen Christiansen, who graduated in geology and art, is a senior graphics editor at *Scientific American*, while Nancy Organ, formally trained in statistics, has experience as a data visualization designer and educator. Each utilizes her unique skills for effective communication.

Traditionally, rhetoric is understood as "a discipline concerned with the effective use of language, to persuade, give pleasure, and so on" (Matthews 2007). While this definition seems self-evident, it is essential to note that contemporary rhetoric encompasses all modes of communication. Interestingly, practitioners, educators, and researchers frequently refer to "the **language** [bold – EM] of data visualization," exploring its grammar, vocabulary, and stylistics (DataVis Lisboa 2020; "Visual Vocabulary," n.d.; Ben-Joseph 2016; Kandogan and Lee 2016).

This context invites a closer examination of three key aspects: first, how various authors describe persuasive communication through information and data visualization, or as some call it, data storytelling; second, how to expand our rhetorical framework to include data, numbers, and statistics; and third, a deeper exploration of the audiences—crucial for rhetoricians—of data and information visualizations. As Burns et al. (2020) state.

> When designers create visualizations for communication, they make choices about encoding and design that they think will accurately and persuasively communicate their interpretation of the data. The ultimate interpretation of a visualization depends on both the designer and the reader.

Inventio

Both books target distinct audiences, as indicated by their titles. *Building Science Graphics* serves as both a textbook and a practical reference for anyone looking to convey scientific information through illustrations for articles, poster presentations, and beyond ("AK Peters Visualization Series," n.d.). In contrast, *Data Visualization for People of All Ages* is more approachable, specifically aimed

at younger generations, including high school students. Each book addresses different aspects of visual literacy. Organ defines this term as "the ability to read and interpret information from images" (*Data Visualization.…*, p. 2), which encompasses data visualization. She further explains that "understanding how to encode and read data from visual elements like shapes and colors is a *gigantic* [italics in original] asset for working with data" (*Data Visualization.…*, p. 2).

In *Building Science Graphics*, Christiansen references literature on data visualizations but aims to "expand that corpus to include a different portion of information graphics spectrum; illustrate explanatory diagrams" (*Building Science*, xx). She notes, "Scientist are expected to be able to create diagrams and figures for their papers. But they are not routinely trained in how to do so" (*Building Science Graphics*, xx). Both authors prioritize the visual aspect of information conveyance rather than treating it as a mere supplement to written content.

Organ emphasizes that data visualization can be viewed as a distinct language for expressing the world—one that enhances understanding and communication through visuals like charts and graphs. While the term "storytelling" is not her primary focus, the book encourages readers to meaningfully engage with data, showcasing various representation methods such as color, shapes, and patterns. For rhetoricians, this offers a new reservoir of resources for analysis.

An interesting aspect of Christiansen's book is its exploration of the status of information graphics and the narrative strategies she proposes. For example, when graphics are published as the primary medium, they should transition from expository to narrative forms (p. 138) by employing recognizable narrative structures such as comics (strategy 1), introducing characters from the conveyed story (strategy 2), and incorporating a narrator (strategy 3) (p. 138-142). Additionally, she offers recommendations for graphics that act as support for text-driven narratives as secondary mediums and those that can be principal characters in their own right (p. 137). The theoretical and practical insights provided in these works are worthy of further study within the rhetoric of scientific communication.

Dispositio

In both books, the content is organized into approachable, well-illustrated sections. *Building Science Graphics* is divided into four major parts: *Underpinning*, *Illustrating Science*, *D.I.Y. (Do It Yourself)*, and *Joint Efforts*. The first part serves as a solid foundation, encompassing 12 of the 18 total chapters. Topics include science communication and graphic design fundamentals, navigating visual complexity, organization and emphasis, visual style, and storytelling strategies. While these topics may be familiar to rhetoricians, the perspective of a graphics

editor offers a refreshing outlook. Christiansen aligns her approach with the fundamental principles of rhetoric, stating: “In my current role as a senior graphics editor at *Scientific American*, my goal with every project is to develop images that **engage**, **inform**, **and inspire** both specialist and non-specialist readers” [bold – EM] (p. xviii). Notably, most of the topics are presented with an academic tone, complete with a robust list of references and a dedicated section in each chapter titled "More to Explore," where Christiansen recommends both professional and academic resources with brief rationales.

The organization of *Data Visualization for People of All Ages* is similarly clear and strategic. The introductory chapters cover types of data and data visualization as such and are followed by ten chapters dedicated to various forms of visual encoding, including length and height, size and area, position, color (four chapters), shapes and patterns, angle, and connections and networks.

In my view, both books offer a fruitful reflection on using information/data visualization in conjunction with ethos, logos, and pathos. For instance, Organ explains how to “use colors to show numerical data in ways that make sense for the values” (p. 99), whereas Christiansen explores not only how and why we perceive color but also its strategic applications. This includes using color as a tool for problem-solving during the planning stages, assisting readers in tracking and organizing elements, and enabling a quicker and more intuitive grasp of new concepts—such as establishing a hierarchy of information and facilitating direct comparisons between scenarios (Chapter 8).

Organ also addresses the potential pitfalls of data visualization, specifically the risks of misinformation, and disinformation. In an era rife with misinformation, various graphs and charts can easily convey misleading content. Prior to the final chapter, which functions as a summary, the concepts of data sonification and physicalization are introduced. As the author explains, data can be encoded through characteristics of sound (pitch, timbre, volume) and touch (texture, temperature, weight, stickiness, or squishiness) (Chapter 14), which makes an interesting contribution to the topic of data visualisation.

The concluding chapter underscores the importance of considering the audience: “Along with knowing the purpose of your visualization – exploratory, presentation, or artistic – you’ll also want to think about the audience for your work. Knowing who the visualization is for will help you create something that is useful and understandable to them (p. 252).” For the author, this represents a conclusion to her exploration of data visualization, while for rhetoricians, it marks the beginning of a communication endeavor.

The consideration of the audience in science communication emerges early in *Building Science Graphics*, where Jen Christiansen, in a conversational style,

notes: “I hate to break it to you, but there’s not a single clear universal road map to science communication success rooted in empirical evidence. That said, there’s still so much to be learned from the folks who are studying it. (TLDR: know your audience, treat them with respect, and tell stories.) (p. 26).”. This approach is evident in other practical chapters, where the author details the various stages of developing science graphics, including not only handwritten notes and storyboards but also concept sketches and audience feedback.

Elocutio

In this section, I will primarily focus on the visual expressions that captured my attention. However, I will begin with a brief note on the verbal aspects of the reviewed books. Both texts adopt a conversational style, although this is exemplified somewhat differently in each case.

Data Visualization for People of All Ages employs school-aged characters, resulting in a straightforward, even colloquial language (as highlighted by the chapter title “Visualization Whoopsies”). The publisher recommends this book as a K-12 resource, prompting older readers to consider this perspective while reading the chapters and analyzing examples of real-life situations more familiar to younger audiences.

In contrast, while the content of *Building Science Graphics: An Illustrated Guide to Communicating Science Through Diagrams and Visualizations* is notably more sophisticated, Christiansen maintains a semi-formal, accessible tone. This choice enhances the reading experience, making it feel almost like a casual conversation with the author without compromising the book's intellectual rigor.

What I want to emphasize are the visual characteristics of both books. On every page of Organ’s work, readers will find explanatory, colorful graphics—including tables—that clearly elucidate the discussed topics. Each chapter concludes with a callout that visually highlights key content. I particularly appreciate how the references are encoded with flames in the chapter bibliography, resembling a restaurant menu. One flame indicates a “mild” resource, which is “nice and light”; two flames represent “Medium: Getting up there…,” while three flames denote “Hot: Serious business!” (p. 311). A small but significant detail in the book’s visual appeal is the set of pictograms that represent the content of each chapter, marked in the top corner of every right-hand page. The visual design of *Data Visualization for People of All Ages* is as approachable as the book's content itself.

Conversely, *Building Science Graphics* conveys its visual characteristics through its very structure. The book exemplifies numerous ideas that align with the rules

and best practices it describes. Beyond the wealth of examples from Christiansen's professional work in *Scientific American*, the book includes various graphics from scientific papers, reports, and other credible sources. It also features sketches and "makeovers" that illustrate the process from invention to creation and iteration. The use of color throughout the book is deliberate: the main text is in black, while important elements such as definitions are highlighted in bold and magenta. Image credits (prepared with meticulous precision) and footnotes are presented in blue. Most explanatory images are set against a beige background. One distinctive design choice is the continuous blue line that meanders like a stream through a forest of words, connecting text and respective images. Chapters 16 and 17 are visually rich and dynamic, offering step-by-step guides on creating scientific graphics, with the author sharing her processes. This serves as an intriguing case study for anyone aiming to prepare a visually creative workbook for students. The visual rhetoric of this book may also provide valuable insights for rhetorical analysis.

Memoria

Both books offer practical guidance, featuring numerous ideas that assist readers in understanding, remembering, and applying the content effectively. *Data Visualization for People of All Ages* includes a short table of contents at the beginning of each chapter, a brief summary, and a section titled "It's Your Turn," which presents various tasks and follow-up questions. Appendix 3 contains a solution guide. Appendix 2 serves as a glossary featuring 29 graphs, complete with names, definitions, illustrations, references to the corresponding chapters, and, last but not least, a brief instruction on how to read the visualized data. Appendix 1 aids readers in recalling fundamental terms such as "ratio data," "opacity," and "captation." The final appendix provides a bibliography organized into thematic sections, including *Color*, *Deceptiveness*, *General Textbooks*, and *Visual Literacy*.

In the case of *Building Science Graphics*, I want to emphasize the memory-enhancing role of all graphic forms and the practical chapters, as well as the Q&A sections where Jen Christiansen engages in discussions with other practitioners about their work, particularly regarding collaboration with expert teams.

Actio

While the book as a medium has limitations in terms of "action," a broader interpretation of this classical rhetorical term allows me to highlight the sections where both authors demonstrate the step-by-step process of creating not only meaning but also the persuasive impact of information and numerical data. They

do this, specifically Christiansen, through sketches, demonstrations, and static iterations known as makeovers. This approach not only enhances the educational value of the reviewed books but also illustrates practical aspects of contemporary communication that may not be immediately apparent to traditional rhetoricians.

Conclusions

In their introduction to *Rhetoric, Linguistics, and the Study of Persuasion*, Randy Allen Harris and Jeanne Fahnestock (2022) identify data visualization as a burgeoning avenue for persuasion research among the new analytical methods being developed. In line with this perspective, I aim to address the question: Why should rhetoricians focus on the topics presented in the reviewed books?

One reason is that information and data literacy are recognized as key digital competencies by the European Commission (Vuorikari et al., 2022). I believe that a holistic and critical rhetorical approach to this kind of effective contemporary communication can greatly enhance the ongoing discourse on this subject.

Furthermore, the term "rhetoric" has appeared in various research papers (e.g., Knape, 2021; Prantl et al., 2025; Hullman and Diakopoulos, 2011). It seems that researchers and scholars from disciplines beyond rhetoric find the "rhetorical framework" valuable, regardless of their specific interpretations. My goal in this review is to present data- and information-driven visuals as engaging artifacts for rhetorical analysis.

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