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Review of *The Chicago Guide to Writing about Numbers* by Jane E. Miller

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Abstract

Miller, J. E. 2004. *The Chicago Guide to Writing about Numbers*. Chicago, IL: University of Chicago Press. 304 pp. Cloth \$45 ISBN: 9780226526300, Softcover \$17. ISBN: 9780226526317.

The Chicago Guide to Writing about Numbers is a reference work suitable for anyone interested in understanding, using, or promoting quantitative thinking. Its primary aim is to identify and illustrate ways in which information associated with numbers can be conveyed most effectively given a particular communication purpose and context. The book is directed at writers who incorporate numbers in verbal or visual displays in documents, in oral presentations, or on the Web. The Chicago Guide to Writing about Numbers identifies overarching principles, offers concrete advice, and presents illuminating examples and models. The book can be used for instructional purposes for undergraduates, and a means of doing so is described. The review concludes by considering the book's contributions to a wider call to help citizens write or argue more effectively by using numbers.

Keywords

writing, communication, numbers, quantitative literacy

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Introduction

The Chicago Guide to Writing about Numbers by Jane E. Miller, published in 2004, is one of the most important contributions to education in quantitative literacy available.¹ What makes it so? What audience and purposes was *The Chicago Guide to Writing about Numbers* intended to serve, and how does it go about addressing them? What are the strengths and weaknesses of the book? How can *The Chicago Guide to Writing about Numbers* be used to help teach quantitative reasoning?

Audience and Aspirations

The intended audience for *The Chicago Guide to Writing about Numbers* is broad: anyone who writes with and about numbers. This includes scientists, business employees, journalists, evaluation specialists, engineers, policy analysts, medical experts, and students. If, as the BBC Radio program on numbers *More or Less* claims, numbers are “the principal language of public argument” (2008), then anyone engaged in the public arguments of contemporary professional, civic, and social life might be interested in *The Chicago Guide to Writing about Numbers*. Moreover, the book’s author, Jane Miller, laudably considers “writing about numbers” to include speaking with numbers and displaying numbers visually (e.g., on Web sites, on presentation slides). In addition, although Miller explicitly indicates that *The Chicago Guide to Writing about Numbers* is not a statistics or mathematics primer, she suggests that much of the guidance she provides regarding writing about numbers may contribute to more knowledgeable readings of numbers. Thus, *The Chicago Guide to Writing about Numbers* has the potential to serve its readers by strengthening both their uses of numbers when communicating and their understanding of the numbers they encounter in communications.

The Chicago Guide to Writing about Numbers is a basic and accessible introduction to writing about elementary statistical and mathematical information. Miller has also written a more advanced version of the book entitled *The Chicago Guide to Writing about Multivariate Analysis* (Miller 2005). The latter work essentially repeats the book reviewed here and extends its application to more complex statistical applications with the addition of chapters on “Quantitative

¹ A 72-pp Study Guide is available on the Web via:

<http://www.press.uchicago.edu/presssite/metadata/epl?mode=synopsis&bookkey=22123>

(accessed December 31, 2008).

Comparisons for Multivariate Models,” “Choosing How to Present Statistical Test Results,” “Writing about Multivariate Models,” and “Speaking about Multivariate Analyses.”

Structure and Contents

What exactly does *The Chicago Guide to Writing about Numbers* provide? First, the book presents listings of basic principles for writing about numbers. Seven such principles are reviewed in Chapter 2 and five others—described as more technical in nature—in Chapter 4. (What separates the two lists, inexplicably, is a chapter on causality and association as well as statistical and substantive significance.) The principles offer such solid guidance as: “Establish the context for your facts,” “Define your terms (and watch for jargon),” “Report *and* interpret.” Each is articulated with keen attention to the specific objectives of a written presentation of numbers and to the particular audiences that might be encountering that presentation. That is one of the pervasive strengths of Miller’s treatment of topics; she reminds the reader that writing about numbers needs to be oriented to a context, and she shows concretely how such writing might vary for different purposes and audiences (e.g., when writing for lay readers vs. scientific colleagues). Each of the principles Miller discusses is illuminated by poor, better, and best versions of a writing example that compellingly demonstrate the merits of her prescriptions. I have used *The Chicago Guide to Writing about Numbers* in an introductory quantitative reasoning course with undergraduates, and my students have found the principles Miller highlights and the examples of poor and exemplary writing with numbers particularly helpful. Chapters 2 and 4, which review Miller’s principles, might serve as superb assigned readings for writing and quantitative courses alike and as a quick précis to the entire book.

The book as a whole is organized into three sections, “Principles” (as just discussed), “Tools,” and “Pulling It All Together.” Under the “Tools” heading, Miller treats the design of tables and charts, quantitative comparisons (e.g., uses of standards, ratios, percentage difference and change), and the selection of examples and analogies (e.g., to illustrate the scale of a number cited). The “Pulling It All Together” section of the book discusses the preparation of full reports, scientific papers, and talks in light of the principles and tools surveyed earlier in the book. How functional is this structure? On the one hand, it results in individual chapters that have different characters, and it’s difficult for a casual user to discern where to look in the book to find information relevant to a particular problem. The structure also results in redundancies, in treatments of a given topic in widely distributed places in the text. Effect size, for example, is discussed in chapters on “Causality, Statistical Significance, and Substantive Significance” and “Writing Introductions, Results, and Conclusions” but then

isn't mentioned in Miller's treatment of the magnitude of an association in a basic principles chapter. On the other hand, the structure works a bit better for someone who reads the entire book. Then the final "Pulling It All Together" chapters serve to remind the reader of principles and norms covered earlier and to show how these can be applied to create a polished finished product.

Although navigating the book as a whole can be challenging, each of the worlds the reader encounters when doing so offers an abundance of resources. The guidance each chapter provides is spot on. This is true both when Miller is presenting concrete rules (e.g., "spell out numbers at the beginning of a sentence," "use the title to differentiate the topic of each chart from other charts and tables in the same document") or when she is treating difficult issues (e.g., the assessment of causality in statistical relationships as discussed in Chapter 3). Even though the writing in *The Chicago Guide to Writing about Numbers* is direct and spare, the content isn't oversimplified. Chapters on preparing effective tables and charts, for example, provide instruction that is as rich but better organized than more extensive general treatments of these topics (e.g., Cleveland 1994; Nicol and Pexman, 2003; Tufte 2001). Moreover, this economy in the presentation of key ideas is reinforced at the end of each chapter in the form of a highly useful summary checklist (e.g., Checklist for Creating Effective Charts).

Using *The Chicago Guide to Writing about Numbers*

How can *The Chicago Guide to Writing about Numbers* be used to further effective communications with numbers? First, and most obviously, the book can serve as a resource that writers can consult to strengthen their presentations with numbers and that teachers who address writing with numbers could review to help shape instruction and lessons. *The Chicago Guide to Writing about Numbers* is a book almost anyone interested in understanding, using, or promoting quantitative thinking should own and read. I'm tempted to add that it should have an iconic presence on our shelves to remind others that numbers are a potentially important and common constituent of written arguments in all of their forms and that resources exist to help people who want to write about numbers.

A more perplexing issue is whether *The Chicago Guide to Writing about Numbers* is suitable as an assigned text in an undergraduate course. As indicated earlier, I do assign readings to students from this book and require its purchase. Nonetheless, it should be said that as useful as the advice given in *The Chicago Guide to Writing about Numbers* is, it's not all that memorable. In part, this reflects the book's straightforward character as a guide. It isn't intended to offer the kinds of narratives students find unforgettable, such as Tufte's brilliant discourses on John Snow's visual accounts of cholera in London and the charts considered in the ill-fated decision to launch the Challenger space shuttle (Tufte

1997). What *The Chicago Guide to Writing about Numbers* could have used a bit more frequently are devices such as the acronym Miller introduces to guide summaries of numerical findings: GEE. GEE stands for Generalization (describing general patterns in the data), Example (illustrating a general pattern using a representative numerical instance), and Exceptions (acknowledging noteworthy variations from the general pattern if they exist). Students remember GEE, whereas they have a difficult time, for example, recalling Miller's seven basic principles.

I try to encourage students to think about presentations of numbers as Miller does through an assignment on "Writing Effectively with Numbers." I ask students in an introductory quantitative reasoning course to write a short (two to three page) paper in which they take any two of Jane Miller's principles or other suggestions in *The Chicago Guide to Writing about Numbers* and evaluate how well a particular argument structured around quantitative evidence meets those standards. This requires students to review Miller's advice and to summarize two points from *The Chicago Guide to Writing about Numbers* in their own words.

The text to which students apply *The Chicago Guide to Writing about Numbers* in my course is *Private Guns Public Health* (Hemenway 2004), a data-infused analysis from a public health perspective of gun violence in the United States. Any example of a piece written with numbers could be used for this assignment, but I prefer to have students encounter and come to appreciate an instance in which numbers are, by and large, employed effectively in an attempt to address an important social issue. This assignment offers one means of using *The Chicago Guide to Writing about Numbers* to promote active learning of Miller's suggestions.

A Passionate Closing Argument

In plain view in *The Chicago Guide to Writing about Numbers* in an unrefined state is an argument that merits greater attention. Although the book is about how to use numbers in writing effectively, it's also implicitly, and at times explicitly, a call to use numbers to make writing more effective. In other words, from a broader perspective the book is about writing or arguing more effectively by using numbers. Doing so sets quantitative reasoning in the context of rhetoric or argument, something I've argued elsewhere (Lutsky 2008) advocates of quantitative reasoning ought to do.

Miller briefly discusses why writing with numbers might be beneficial in the chapter introducing *The Chicago Guide to Writing about Numbers* and in passing comments throughout the book. A particular point she makes deserves greater attention. She suggests to writers that they can use numbers in the beginning of a paper to establish the importance of a topic, for example, by citing statistics to

indicate the frequency with which a problem occurs. Numbers might also be used in an introduction to a paper to describe the broader domain within which a particular example—which might be the focus of the paper—falls. Such uses of numbers, which my colleagues and I have come to label “peripheral” (Lutsky 2008), open up the territories to which writing with numbers potentially applies. A recognition that numbers might strengthen writing that is not primarily quantitative in character has significant implications for where quantitative reasoning is taught in a curriculum and the kinds of guidance writers need in order to use numbers effectively. For example, writers might need to know how to find numbers for use in their writing and how to evaluate the sources upon which they are relying, which involves informational literacy. The opportunity to guide writers through those tasks is something *The Chicago Guide to Writing about Numbers* missed. That doesn’t detract from what is on its own terms an outstanding resource, but it shows how much more we all could do to make arguing with numbers increasingly common, better informed, and more principled.

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