

scenario is that a new intermediary position in libraries devoted to license and contract negotiation will begin to appear. The current situation, that is, the need for librarians to have substantial responsibilities in an area in which they are not professionally trained, for instance, contract law, is not sustainable. An alternative to a new position, one that is already occurring in some academic libraries, would be that such responsibility is farmed out to institutional legal counsel or purchasing specialists." Besides speculating about the future, this passage captures current controversy in the library world. Care should be taken in presenting these assertions to a generalist audience: that is, a group of library science students planning careers in public service or administration rather than technical services. However, the passage exemplifies beautifully the kind of inquiry to which the newly fledged electronic resources librarian should be equipped to respond, in a manner appropriate to the particular professional setting.

While the book's content has strengths, its editorial problems make it unnecessarily difficult to use and, in some instances, a poor example of an effective presentation of material for students. If we understand that course texts not only provide knowledge but also model standards for how knowledge should be presented, then editorial decisions have ramifications beyond the surface. Grammar and punctuation errors are numerous.

The most notable editorial weakness is the index, a shortcoming that, one hopes, will be redressed in future editions. Significant terms used in the book are omitted: for example, "best practices" does not appear in the index at all. However, it occurs in the table of contents and appears seven times across a span of four chapters (32–84). There are also instances in which a term may be listed in the index but the pages on which it appears are only partially enumerated: for example, the term "link resolver" is indexed as appearing only on page 101 when in fact it appears in the text five additional times. Some terms appear in the index only as compounds: for instance, "Project COUNTER" appears under "P," its presence indicated on pages 111–114, but the standalone term "COUNTER" appears on its own on five more pages, including a substantive discussion on page 41, yet is not indexed under "C" at all. These indexing issues were discovered through a series of full-text searches in Google Books. Relying on a full-text search in the e-book version is problematic irrespective of the need to type a query each time a reference is desired. For example, when a search on forms of the word "cancel" (also absent from the book's index) was done, it yielded nonmutually exclusive results. On its own, the index is an incomplete and at times potentially misleading reflection of the book's content, and in particular it makes content review and analysis, even of topics known to have been covered, significantly more difficult. It also makes harmonizing the learning experience across users of the print vis-à-vis the electronic edition problematic.

The coauthors have curated the information from the electronic resources domain that is most difficult to absorb independently and methodically. In doing so, they have contributed a concise survey that promises to remain topical into the future and provides a skeleton for the necessary deeper investigations that electronic resources management requires at a professional level.—*Mary O'Dea, St. Cloud State University*

**Cathy O'Neil.** *Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy.* New York: Crown Publishers, 2016. 272p. Hardcover, \$26 (ISBN 978-0553418811).

At a moment when democracy is under threat on multiple fronts, Cathy O'Neil's *Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy* describes how a wide spectrum of industrial and governmental practices, poorly conceived models, and algorithms are being used to negatively impact the lives of the most vulnerable. Through a series of engaging case studies, she documents these

negative outcomes and traces their roots to bad software design and, more deeply, to an ill-founded faith in the power of a certain type of computational thinking.

A trained mathematician and one-time Wall Street quant, O'Neil has turned her considerable talents to understanding and undoing the harms of big data and, in her words, to "using data science to do good." You can follow her work at <http://mathbabe.org>.

What exactly is a weapon of math destruction? O'Neil describes them as abstract computer models that are used to make judgments based on flawed statistical models, often with disastrous consequences for those impacted by these judgments. The logic underwriting a weapon of math destruction (WMD) is opaque to all but the programmer writing the algorithm and the data scientist creating the model. WMDs are self-fulfilling prophecies, lacking any meaningful way to learn from the mistakes that they make in their modeling of the world, instead creating feedback loops that paradoxically make their incorrect predictions inevitable.

In a series of case studies drawn from a variety of fields, she describes in detail both how a WMD operates and the flaws in the ways that WMDs are developed and deployed. She describes how WMDs are used to deny credit to the credit-worthy; how WMDs are used in the targeting of advertisements by for-profit colleges to reach at-risk populations; and the statistical confusion of correlation with causation in the WMDs deployed by the insurance industry. She worries about the role of WMDs in the construction of our civic lives through social media. In all of these cases, she demonstrates the ways in which WMDs punish the poor in particular, but also the noxious effects of WMDs on us as a society as a whole.

O'Neil is not a Luddite. She believes in the power of big data marshalled appropriately and ethically to improve our lives. While her main positive example of models and algorithms done right come from the world of baseball, with its use of big data made famous through *Money Ball*, she concludes her work with a hope for what I might call "Instruments of Mass Improvement": the use of statistics, modeling, and algorithms to make the world more fair and more just.

Why should librarians care about this? There are two reasons. First, as the world of information becomes increasingly mediated by models and algorithms that shape our experiences, we need to expand what we cover in information literacy instruction to include these concepts. What are the underlying assumptions of the system we are using to find information? Who wrote the software and for what reason? How do these assumptions and motives impact what we are shown? What sort of information about us is the system collecting?

The second reason this work matters to libraries is that libraries have social justice as a core value. Our commitment to privacy, to freedom of expression, and to the first amendment are all part of a broader belief in the key role that access to information plays in a democracy. As we have learned in the past few months through conversations about the impact of hacking and fake news on the recent election, information and democracy are inextricably linked. O'Neil's exploration of the negative impacts of poorly conceived models and algorithms have on the lives of the poor in particular reveals another front on which to continue our ongoing efforts to sustain our democracy through direct and equitable access to ideas.

While dealing with a highly technical topic, *Weapons of Math Destruction* is remarkably engaging and highly accessible. There are no complex mathematical formulas to parse or software code to digest. In lieu of footnotes, comprehensive evidence and citations for further reading are tucked quietly in a concluding notes section. For librarians and fellow travelers concerned with how technology and big data are impacting our democratic institutions, *Weapons of Math Destruction* is a must-read. —Michael Roy, Middlebury College