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The Skewed Few: Does "Skew" Signal Quality Among Journals, Articles, and Academics?

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Abstract

We tend to reify a few high-impact journals as top-tier, articles that appear in them as high quality (often without regard to their individual impact), and the small number of authors (and their institutions) who publish in them frequently as distinguished (and elite). Although such praise is warranted at times, the author hopes to encourage some skepticism in its granting and direct greater attention to "the many" authors, articles, and journals not found among "the few."

Keywords

research quality, journal quality, skewness

That the academic world is skewed in many ways is certainly not a new observation. Indeed Pareto, Lotka, Zipf, Yule, and Bradford, among many others, long ago established that skew constitutes the natural order of things in academia. Skew, which can be positive or negative, indicates a deviation from the normal distribution. A positive skew, which typifies academia, means that the right-hand tail of the distribution is longer than the left tail and that most observations fall to the left of the mean. Figure 1 illustrates the nature of skew. Within management and organization studies, the "skewed few" are those journals, articles, and authors occupying the "fat" right tails of publication and citation distributions. They are considered the distinguished elite among us—their presence in these tails increasingly regarded as a signal of their quality. I take a critical look at the veracity of this widely held assumption and explore its implications for our field.

Publication Skew

Academics do not publish equally. A few publish a great deal; many more publish a good deal less. A select few publish a great deal in "top-tier" journals. Many more do not. Lotka's (1926) inverse square law (and more recent variants) attempts to characterize the distribution of academic publishing. According to Lotka,

> the number [of authors] making two contributions is about one fourth of those making one; the number of those making three contributions is about one ninth, and so on; the number making n contributions is about $1/n^2$ of those making one (p. 363).

So, if 100 academics publish 1 paper, 25 will publish 2, 4 will publish 5, and 1 will publish 10.

The empirical distribution of productivity among management academics conforms quite well to Lotka's law (although better still to an inverse Power Law). For example, Figure 2 displays the frequency distribution of authorship in the *Academy of Management Journal* (*AMJ*) for the period 1990 to 2010. Although more than 600 of the 1,063 authors who appeared as an author in *AMJ* during this period were listed on a single article, 25 appeared on 5 articles, 4 on 10 or more articles. Such skew in the distribution of authorship produces a great deal of concentration: 10% of *AMJ*'s authors accounted for 30% of its publications, and 50% of its authors for 75% of its publications. Other management journals, including *Administrative Science Quarterly, Journal of Management Studies, Organizations Science*, and *Strategic Management Journal*, display a similar skew and concentration in their authorship. Notable in the pattern of skew among academics is that the same authors tend to remain in the tail over time and, moreover, to increase their advantage as their cohort ages.

The productivity of academic institutions displays a similar skew. A small number of university faculties publish a great deal, many more a good deal less. A very few faculties publish frequently in "top-tier" journals. Many more do not. Indeed, institutional productivity is more strongly skewed than individual productivity. As Figure 3 shows, for

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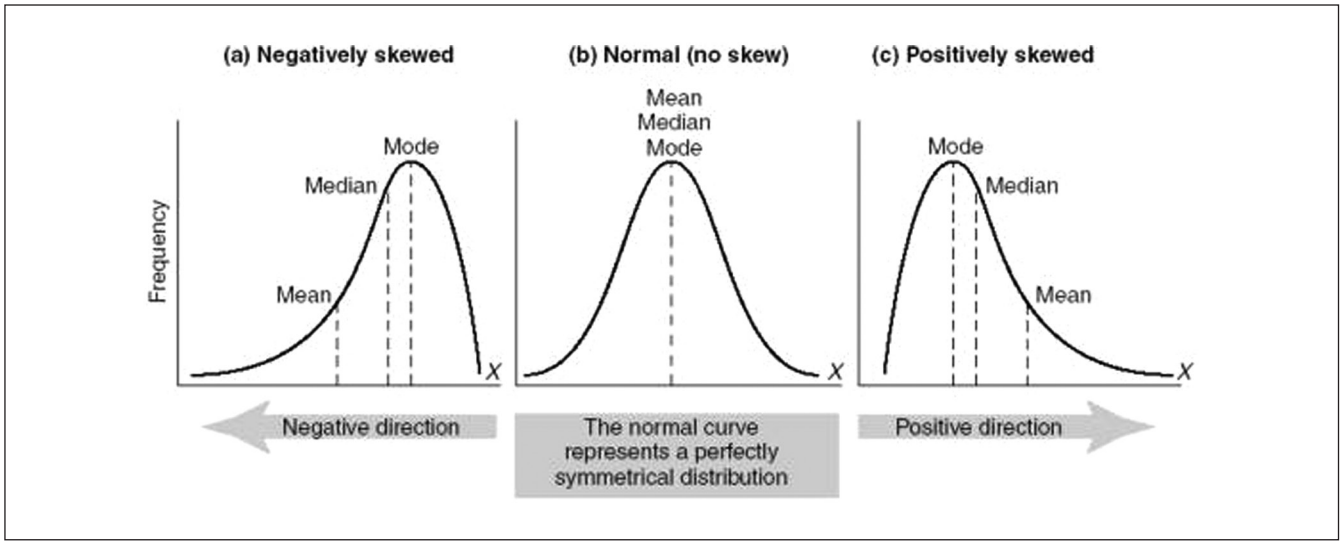

Figure 1. Skewness

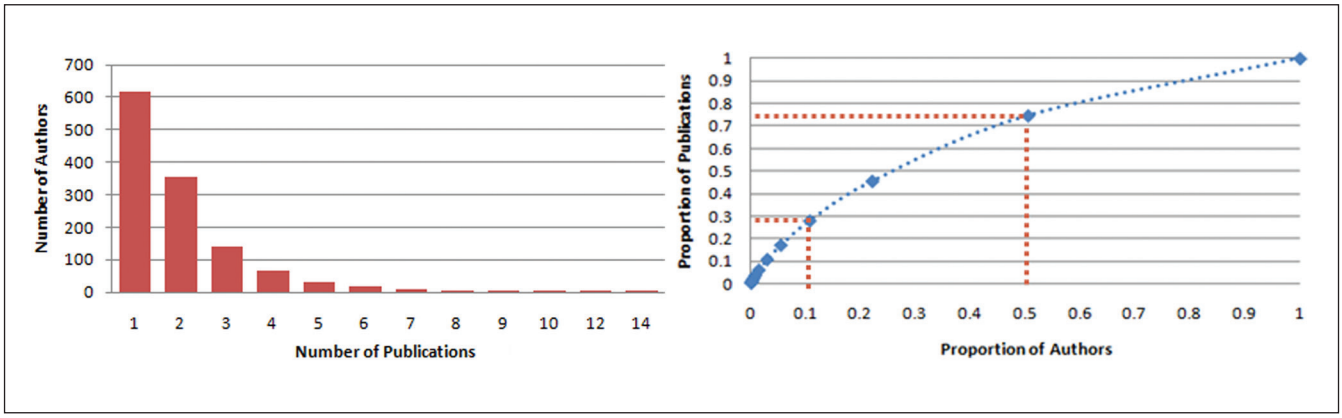

Figure 2. Author Productivity, *Academy of Management Journal,* 1990-2010

example, among the institutional affiliations of authors who published in *AMJ* between 1990 and 2010, 80% appeared on 1 article, 15% on more than 2, and 5% on more than 10 (maximum = 53). The resulting institutional concentration is quite unsettling. Fewer than 5% of the universities whose faculty published at least one article in *AMJ* accounted for more than 50% of all *AMJ* articles during this period. Again, other management and organizations journals display a similarly high institutional skew and concentration. And, once again, the skewed few are surprisingly sticky—The same few institutions tend to remain in the right tail and to increase their advantage over time.

Citation Skew

At this point, it will likely come as no surprise that article citations are also positively skewed. A few articles are cited a great deal, many more are cited a good deal less; in fact, many are cited rarely, and some not at all. Again, consider the example of *AMJ* publications for the period 1990-2010. Figure 4 plots article citation frequencies by their mean number of yearly citations. Most *AMJ* articles are cited less than twice per year. A very small number is cited more than 30 times per year (maximum = 56). As a result, citation concentration levels are very high: 20% of the articles receive 50% of the citations; 50% of the articles receive 80% of the citations. Of course, this means that the "other" 50% of articles receives just 20% of the citations.

Like the articles they publish, journals themselves are also cited unevenly. A few journals are cited a great deal, many more a good deal less. Indeed, most are cited infrequently, at best. To illustrate, Figure 5 plots journal frequencies by 2008 Impact Factors (2-year in the left panel; 5-year in the right panel) for the 88 management journals covered

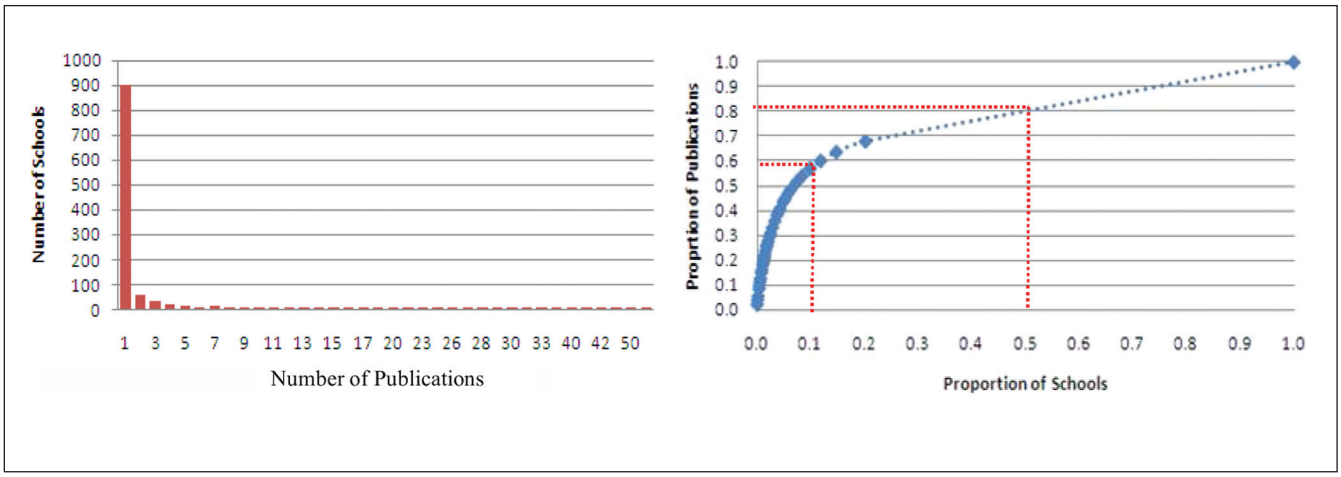

Figure 3. University Productivity, *Academy of Management Journal*, 1990-2010

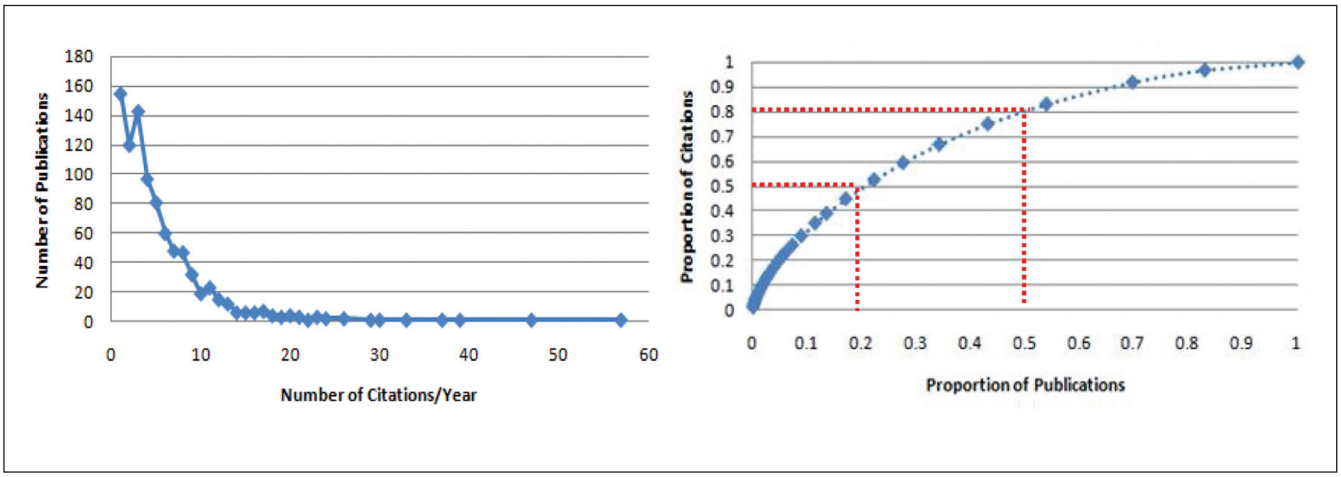

Figure 4. Article Citations, *Academy of Management Journal,* 1990-2010

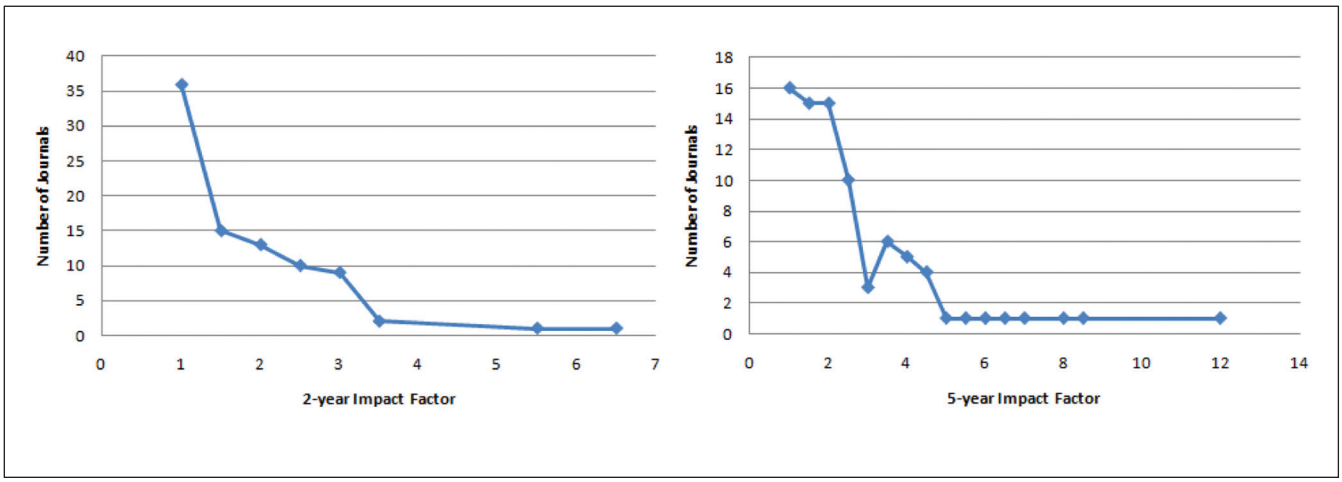

Figure 5. Management Journal Impact Factors, 2008

by the Institute for Scientific Information (ISI) in its 2008 Journal Citation Report.[1] Most journals have low Impact Factors; a few have high ones. A total of 36 management journals had 2-year Impact Factors of 1.0 or less; only 4 had 2-year Impact Factors of more than 3.0. A total of 46 journals had 5-year Impact Factors of 2.0 or less; only 5 had Impact Factors higher than 6.0. And, like other forms of skew in academia, journal Impact Factors are very sticky. Such extensive skew in publications, citations, and journal Impact Factors merits reflection.

The Skewed Few

The idea that a few "top" authors from a few "top" institutions publish a few "top" articles in a few "top" journals has a certain, orderly appeal to it. But this order is not without consequences. The skewed few authors are generally held in high esteem as thought leaders and distinguished scholars who have made foundational contributions to our understanding of management and organization. Understandably, they are happy to accept the attribution that it is their "quality" that distinguishes them from the many. The skewed few journals are held in esteem as top-tier outlets based on the "high-impact" articles they have published. Publication in these outlets is coveted. And their editors are happy to embrace the idea that it is the "quality" of their content and their editing that explains their distinction from "second-tier" journals.

The skewed few authors are in demand as collaborators, often working with more junior colleagues anxious to be associated with them. They are sought after by elite institutions, their influence on the standing of these schools promoting a winner-take-all market for their services. Top-tier journals covet these authors too for their disproportionate contribution to the journals' Impact Factors, and so, not surprisingly, they (and their elite employer institutions) tend to dominate their editorial boards.[2] The more authors are published and cited, the more they are recruited by elite institutions and top-tier journals, which means yet more publications and citations. Authors in turn covet top-tier publications, as elite school recruitment, tenure, and promotion committees increasingly emphasize publishing in them.

Skewed Quality

Unsurprisingly, publication counts and citations are strongly correlated with peer appraisals of researcher impact and reputation, as well as receipt of prestigious honorific awards (Narin, 1976). But do skewed publication and citation rates really signal quality?

If access to resources and expertise is allocated on the basis of early academic achievements—including pedigree, provenance, and publication—and if these achievements each contains an element of luck, then some academics will gain a competitive advantage that does not accurately reflect their initial ability. Furthermore, those who lag in early achievement will find it difficult to catch up. The operation of such a so-called "Matthew Effect" (wherein the rich get richer and the poor get poorer) thus casts doubt on the relationship between publication skew and quality, suggesting that the most prolific authors may not also be the most highly cited authors, but rather the luckiest. In the presence of such an effect, "the many" may thus be justified in doubting the quality of the few who become "stars."

Table 1. 100 Most Cited Articles, 1980-2010

Journal	Top 100 articles	Top 100 authors	Total articles	Total authors
Authors ≤ 4 articles				
ASQ	76	158	627	425
Org Sci	76	169	1,465	901
AMJ	66	175	1,636	999
AMR	88	164	1,056	461
Total	306 (76.5%)	666 (93.4)	4,784 (87.0%)	2,786 (96.1%)
Authors ≥ 5 articles				
ASQ	24	14	124	18
Org Sci	24	11	115	22
AMJ	34	15	416	63
AMR	12	7	58	11
Total	94 (23.5%)	47 (6.6%)	713 (13.0%)	114 (3.9%)

Notes: *ASQ* = *Administrative Science Quarterly*; *AMJ* = *Academy of Management Journal*; *AMR* = *Academy of Management Review*; *Org Sci* = *Organization Science*.

Consider the 100 most cited articles published from 1980 to 2010 in the journals listed in Table 1. Authors who published 4 times or less in these journals account for 76.5% of all top 100 articles. However, authors publishing 5 or more times in these journals, who represent just 3.9% of all authors, account for a startling 23.5% of these articles. Simply put, these few prolific authors contribute disproportionately to the top 100.

Matthew thus seems mistaken in our case: The most prolific authors in management and organization studies are also the most highly cited authors and so apparently not simply the initially luckiest. Perhaps, then, citation skew does in indeed signal quality. There is, unfortunately, little discussion in the sociology or philosophy of science literatures regarding the significance of skewed citations. What is clear, however, is that why authors cite particular articles and the meaning of those citations is far more complex than the naive normative view of citation as an indication of quality and intellectual debt.

We cite papers that confer legitimacy in certain topics, methods, or journals. We cite literature reviews rather than the original articles to which those reviews are indebted. We cite more versus less cited articles, and well-known versus lesser known authors. We cite our friends and colleagues. We cite to ingratiate editors and potential referees. We do

not cite articles regarding established knowledge regardless of their quality. In sum, we cite for utility—affirmation, signal, salience, substantiation, and consecration—as much if not more than for quality and intellectual debt. The result is that the probability of a given article being cited tends to increase with its author's and its own prior citedness. And, small initial differences in article citedness tend to grow over time. So, maybe Matthew is right after all, and the most highly cited authors are indeed the initially luckiest.

Skewed Implications

We are increasingly burdened (and obsessed) by quantitative assessments of our lives—in academia and more generally. Seduced by its simplicity and putative objectivity, we have turned quantitative analysis on ourselves. But we don't seem to have done so in a manner consistent with the care to which we aspire in our own research. The quantitative measures we use, including publication counts, citation counts, and journal Impact Factors, certainly reflect (and inspire) particular kinds of performance, but they do not necessarily measure quality. Such ill-conceived measures typically fall into disrepute and disuse within a scientific community. Remarkably, this has not been their fate within organization and management studies. If anything, and without any meaningful discussion of their veracity, or consultation of the vast literature on the limitations of bibliometrics in the evaluation of research, we apply these measures with increasing frequency to an ever-expanding range of performance assessments, distorting our scholarly contributions in detrimental ways.

Increasingly, and despite repeated, direct, cautionary counsel from the *ISI* that journal Impact Factors (e.g., Institute for Scientific Information, 1994) were never intended to assess individual papers and authors, the tendency is nonetheless to ascribe quality to high-impact journals and the ostensible quality of a given journal to every article it publishes, thus making a researcher's contribution less important than where it is published. Yet the great variance we have seen in citedness among a journal's articles makes it difficult to see the sense in this halo-like attribution. Of course, this variance also makes it difficult to see the sense in distinguishing "top-tier" journals based on their Impact Factors. The result of us doing so is that "top" journals, along with most of their authors, free ride on a few highly cited articles that contribute disproportionately to their Impact Factors.

The result is also, not surprisingly, that authors (and their institutions) increasingly emphasize publishing in so-called "top-tier" journals. To do so, they attempt to consecrate their work by aligning topics, theories, and methods with those favored by the journals, and by citing their reviewers, board members, and editors. The successful, to see their work published. The unsuccessful work their way down the journal ranks with each rejection, cascading top-tier journal predilections and citations across the journal spectrum. Not only is author behavior affected but also that of journal editors who engage in various forms of Impact Factor "engineering" to advance the standing of their journals (Reedijk and Moed, 2008).[3]

It is both curious and troubling that we would escalate our reliance on such flawed measures to evaluate our own performance and order our field. Why we do so is not entirely clear; however, the resulting distortions make it clear that we need to stop. We tend to regard a few high-impact journals as top-tier, the articles that appear in them as high quality (often without regard to their individual impact), and the few authors (and their institutions) who publish in them frequently, as distinguished (and elite). Although such attributions are at times warranted, I hope my analysis encourages some skepticism in their making, and focus greater attention to the "many" authors, articles, and journals not among the skewed few.

Donald Campbell (1975) famously recanted his early view of the case study as having "almost no scientific value" (Campbell & Stanley, 1966), concluding that "for the alert and conscientious social scientist, it is falsification, not verification, that characterizes the case study." Many of us have adopted Campbell's revised view of the case study. It is time to for us to also recant our comparable view of "the many." Although their work may be somewhat different in topic, theory, and method from what the few "top" authors publish in the "few" top journals the alert and conscientious social scientist—to mimic Campbell—will find much of this work rigorous and sound, representing a vital source of insight, inspiration, and innovation for our field.

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Notes

1. A journal's Impact Factor indicates the mean number of current-year citations per article published by the journal over some time horizon. A journal's 2-year Impact Factor is thus the number of current-year citations (here, 2008) to articles published by the journal during the preceding 2 years (here, 2006-2007) and dividing by the number of articles the journal published in those 2 years. For the 5-year Impact Factor, it is the number of current-year citations to articles published by the journal during the preceding 5 years (here, 2003-2007) divided by the number of articles published in those years.

2. For example, the *Academy of Management Journal*'s 2008 two-year Impact Factor falls from 4.75 to 4.25 without the 4 most cited articles (of 126 total articles), and the 5-year Impact Factor falls from 6.78 to 6.43 without the 4 most cited articles (of 291 total articles)
3. Editors can, for example, publish more review articles because they tend to attract more citations than research articles, publish editorials citing multiple articles from their recent issues, invite "non-articles" (e.g., provocative minireviews, perspectives, editorials, etc.) that are likely to generate many citations; encourage editorial board members to publish papers in the journal and to cite one another; reject papers in narrow or peripheral topic areas, or from lesser known authors and regions of the world, which are unlikely to be widely cited; make acceptance conditional on inclusion of citations to the journal—a practice bordering on extortion.

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Bio

Joel A. C. Baum is an associate dean (faculty) and George E. Connell chair in organizations and society at the Rotman School of Management, University of Toronto (with a cross-appointment to the Department of Sociology). His research is focused on the dynamics of interorganizational relationships in diverse industry settings, including liner shipping, investment banking, biotechnology, and private military services, as well as computer-simulated environments. But, it was his abiding interest in understanding the knowledge production in the field of management and organization studies that inspired the present analysis. Joel was founding coeditor of *Strategic Organization* (2001-2011), series editor for *Advances in Strategic Management* (1998-2010), and currently serves on the editorial board of the *Strategic Management Journal*. He received his PhD in organizational behavior from the University of Toronto late in the last millennium.