RESEARCH ARTICLE

Numbers or no numbers in science studies

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Keywords: qualitative, quantitative, science studies

ABSTRACT

This article analyzes my own research trajectory with respect to the qualitative/quantitative divide in science studies and situates my work in the field.

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Citation: Bowker, G. C. (2020). Numbers or no numbers in science studies. *Quantitative Science Studies*, *1*(3), 927–929. https://doi.org/10.1162/qss_a_00054

DOI: https://doi.org/10.1162/qss_a_00054

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Handling Editors: Loet Leydesdorff, Ismael Rafols, and Staša Milojević

The MIT Press

I often recall my induction into American academia, lo these many years, at the University of Illinois at Urbana Champaign. My partner, Susan Leigh Star, was in Sociology and I was in Library and Information Science. The Sociology Department imploded about 2 years after her arrival—and she was one of the precipitants. The battle was been the "quantheads" (as we called them) and the 'quals' (not to mention the 'two headed ethnomonster' aka ethnomethodology). I couldn't believe that I was being invited into theological battles of no real significance (shall we count the number of angels on the head of a pin, or just describe them?). Then Leigh told me about the Chicago School of Sociology, which had been expelled from Eden (aka the University of Chicago) by the quants. This was a lasting trauma for the School—what had happened, the story went, was that the quants had stormed in—and whereas no quant ever voted a qual for tenure or hire, the quals judged cases on their merits. I always had doubts about this story but it's persuasive—sort of like U.S. politics right now: If only one side believes in fairness and the other side believes in the one, true, right, and only way, then the latter wins. I have witnessed a number of analog (or should that be digital?) battles over the years, which confirm that we are dealing with faith rather than philosophy—and that faith is a powerful political force.

I had a touching meeting with Loet Leydesdorff at the Social Studies of Science annual meeting about 10 years ago. He and I were saddened by the exclusion of scientometrics from social studies of science. From my background in science studies, actor-network theory was integrally scientometric (the Leximappe program—see Callon, Law, and Rip [1986]) and ontological/ethnographic. How could it be otherwise? He pointed out rightly that scientometrics had been expelled from our rather shabby temple, and that even when they put on sessions, it was only those who already had the faith who attended. And the true paradox was that the qualitative and the quantitative had grown up together in science studies—they were richly intertwined, were exploring the same questions with different methodologies, were learning from each other. Then we witnessed the revenge of the quals. It didn't matter that they hadn't read, thought about, or heeded scientometrics—our emergent discipline was to be partly defined by the rigorous extirpation of statistical analysis.

So much was lost along the way. Prosopography—which was incredibly insightful, but barely got started. The capture of emergent trends in science and technology through analysis of subtle indicators. I loved the work that the Ecole des Mines folks (specifically Michel Callon and Bill Turner) had done on the traffic between scientific papers and subsequent patents. This could not have been studied without large-scale statistical analysis. Of course this is not true of all

"science studies"—especially in the policy realm (I know studies of environmental policy closest here, and it is exemplary), there is still free and full movement between the spheres.

An analogy. When I talk with students about functionalism, they often shudder and give a metaphorical sign of the cross. This is odd—they've been taught that it's bad, but not what it is—only a tired caricature. When I see students repeating this nonsense, I refer them to Mary Douglas—an avowed functionalist and a brilliant social theorist. These very antifunctionalist students frequently parrot the phrase: "What work does … do?" without any awareness that this formulation is the same as: "What function does … have?." It is an unthinking, knee-jerk ideological response, but it's part of the vulgate, so why fight it?

Another analogy. One of the most promising developments of the past 20 years in the humanities has been distance reading. Franco Moretti developed (without, as far as I can tell, reference to scientometrics) a wonderful theory that enabled the study of vast text corpora (for all 18th- or 19th-century literature). According to him—and I agree—we could find new genres of literature that do not yet have a name. And there is a very good qualitative reason for this—as Cliff Siskin (2016), demonstrates in *System*, it was the winners—for example, Wordsworth defining romantic poetry for the generations—who won the day. It is *only* through distance reading that you can cut through the rhetoric and recover stories not yet told. Yet this is precisely what we were doing in the 1980s with very large text corpora. We were finding scientific movements that did not yet have a name and were projecting their future development. The statistical analysis allowed us to read against the grain of texts. Deconstruction, at the same epoch, promised the same: to read askance. And yet, unfortunately, this small contribution is possibly alone in making this obvious connection: The schools are too far apart.

My own background was Annalist history, which completely mixed the qualitative and the quantitative. If, following Braudel, you want to understand Mediterranean culture by escaping the boundaries of nationalist historiography, then of course you needed not just a subtle analysis of the nature of "peoples"; you also needed good figures on the circulation of goods and food to develop your claim. They tried to piece together all the available information and turn it into a story. Second, the folks who crunched the numbers equally did the qualitative work—Francois Furet (1981, 1982) wrote one of the most perceptive discussions of the French revolution (*Thinking the French Revolution*) and with Marcel Ozouf performed one of the best discussions of literacy based on careful statistical analysis.

A lot of my work has been about classification systems: Quantification is key. If we are using numbers, we are enumerating over a set of categories—which poses the question of where these categories came from. In my current work on machine learning, the shoe is somewhat on the other foot. I consistently have to justify saying that classification is occurring (Bechman & Bowker, 2019) when number crunchers say that it's all about computers crunching raw data—as if such a thing existed! Classification occurs at many levels in complex algorithms: It doesn't precede numbers, but nor does it succeed them—the two are folded into each other. Any mode of understanding the world of science and information today needs to integrally consider the two at each point along the analytic path.

As is clear, I fully support the program of this journal. The world is too complex and the decisions we must make too difficult to allow us to ignore any set of useful tools. Our field will be so much the richer when the two are reunited.

COMPETING INTERESTS

The author has no competing interests.

FUNDING INFORMATION

No funding was received for this research.

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