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## Web of Science Citation Data

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## IV

# Web of Science Citation Data

Rachel Stohr

The unprecedented challenges of “information overload” in the digital age have prompted academic institutions to develop new approaches to gauge scholarly authority and productivity, and disseminate research. The goal of this chapter is to consider the strengths and weaknesses of one such metric, and to speculate on the implications of its continued use for the academy, the communication studies discipline, and society. Specifically, I explore Web of Science citation patterns, a contemporary metric of scholarly authority that measures scholarly impact and influence via number of author and/or article citations over time. This report is comprised of four sections: (1) a history of the metric, (2) the major strengths and weaknesses of the metric, (3) a judgment regarding the degree to which the metric measures what it purports to measure, and (4) a position on whether or not the metric is an appropriate tool with which to evaluate scholarship in the communication studies discipline.

### *History*

In 1960, Eugene Garfield founded the Institute for Scientific Information (ISI), the first citation index for articles published in scholarly journals.<sup>1</sup> The ISI featured citation databases for thousands of scholarly journals, and print-based indexing

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<sup>1</sup> Eugene Garfield Webpage, <http://www.garfield.library.upenn.edu/>

services Science Citation Index (SCI) and Social Sciences Citation Index (SSCI).<sup>2</sup> Today, the digitized version of these widely-used tools for generating citation data is known as the “Web of Science.” The Web of Science is an online academic search portal that provides access to ISI citation databases; it is part of the Web of Knowledge, a broad collection of databases first acquired by Thomson Scientific, and currently owned by Thomson Reuters, the product of a 2008 merger of the Thomson Corporation, a publishing agency, and Reuters, a news corporation.<sup>3</sup> These databases can be accessed through most university libraries for a fee.<sup>4</sup>

Web of Science citation patterns comprise a metric of scholarly “authority 2.0”<sup>5</sup> that enable researchers to calculate how many times and by whom their work has been cited. These patterns may be used to determine both the Journal Impact Factor (JIF) and an author’s h-index. The JIF for a given year “reflects the number of citations of a journal’s material in the preceding two-year period divided by the number of citable materials published by that same journal”<sup>6</sup> and the h-index calculates an author’s citation distribution, measuring both the number of an author’s publications and citations per publication. Web of Science citation patterns can thus be conceptualized as a criterion by which other scholarly metrics measure scholarly authority.

### *Strengths and Weaknesses*

The major strengths of the Web of Science include access to approximately 10,000 journals that feature multidisciplinary and both regional and global journal articles, journal backfiles to 1900, “cover-to-cover” indexing, author identification tools, analysis capabilities, and the ability to see where top researchers are publishing and presenting their findings.<sup>7</sup> Weaknesses of the Web of Science include the fact that it does not count citations from books nor does it control for self-citation or instances in which articles are cited for reporting erroneous data, its comparatively low number of journals (Web of Science com-

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2 Web of Knowledge Fact Sheet, <http://www.thomsonreuters.com/webofknowledgefactsheet.pdf>

3 Web of Knowledge Fact Sheet.

4 Thomas Hugh Feeley, A Bibliometric Analysis of Communication Journals from 2002-2005, “*Human Communication Research*”

5 Michael Jensen, “The New Metrics of Scholarly Authority,” *The Chronicle Review* (June 15, 2007)

6 Kurmis 2003

7 Web of Science Fact Sheet.

petitor Scopus has nearly double the number of journals), citing errors, and the possibility of promoting “cronyism” among researchers as a means by which to boost citation counts.<sup>8</sup> Additional limitations of the metric include the fact that raw citation numbers place far too much emphasis on quantity, and fail to address the quality, value, and disciplinary significance of an author’s work.

### *Judgment*

Academic institutions tend to rely on citation patterns for making decisions about hiring, tenure, and promotion, and thus operate under the assumption that this metric effectively measures scholarly impact, influence, and disciplinary contributions. Because Web of Science citation patterns inform other scholarly metrics that purport to measure journal impact or circulation for example, the metric does not claim to measure one particular element of research quality. Rather, Web of Science citation patterns are hailed by proponents as a way of accurately reporting validity and reliability in citation counts. Such a mindset, however, prizes quantity of publications over quality of work, perpetuates the flawed “publish or perish” logic, and exacerbates the oncoming publishing “tsunami.” Specifically, Baveye contended that, if this publishing trend continues, “there will continue to be significant serial price hikes, constantly exceeding inflation and steadily worsening the plight of academic libraries.”<sup>9</sup>

### *Field Relevance*

Protagoras’ “human measure” fragment asserts that human beings themselves can measure things and thus weigh the better of two or more arguments. People are therefore capable of debating and evaluating ideas in nuanced and meaningful ways. The “human measure” fragment can inform current discussions about the proliferation of scholarly metrics, and change the ways in which academic institutions and society at large evaluate scholarly authority, influence, and impact. Specifically, the communication studies discipline must embrace a transformative understanding of scholarly authority in the digital age by incorporating metrics that move beyond quantity to measure quality of scholarship. Current metrics of scholarly authority alone, including Web of Science citation

8 Lokman I. Meho, “The Rise and Rise of Citation Analysis,” *Physics World* (January 2007).

9 Phillippe C. Baveye, “Sticker Shock and Looming Tsunami: The High Cost of Academic Serials in Perspective,” *Journal of Scholarly Publishing* 41 (2010): 191-215.

patterns are not appropriate tools with which to evaluate scholarship in the communication studies discipline because they tend to value individualism over collaboration and breed competition rather than community-building.

The communication studies discipline must mimic ideas put forward by the Howard Hughes School of Medicine, for example, thereby enacting Isocrates' "philosophia" to use one's work, not promote one's self and/or career, but to unify and extend a scholarly community that actively contributes to the betterment of society. To do so requires that communication studies scholars reconceptualize the "value" of their work to include, not number of citations in a given journal, or acceptance in and among a small group of their peers, but rather relevancy to and impact on the larger public. Communication studies scholars (and all academics) must rid themselves of the tendency to adopt an elitist attitude that what is popular among the masses is inherently unworthy of serving as a metric of scholarly authority.

Scholars can incorporate the popularity of an article or topic among "everyday" members of society as a measure of importance/relevance to the public. By doing so, scholars will incorporate academic expertise in popular culture, as well as utilize new technologies to share information outside of the academy with people for whom quality of life will improve with access to such knowledge. In sum, Protagoras' "human measure" fragment can, and I suggest must, serve as a guide for the creation of new metrics of scholarly authority that promote community, collaboration, and information-sharing over competition and individualistic attitudes of impact that rely solely on the quantity of increasingly shallow, often inconsequential scholarship.

Challenges posed by an increasingly interconnected, changing world to conventional notions of scholarly authority, productivity, and research dissemination present universities with an unprecedented opportunity to develop and implement new approaches to scholarly research and information-sharing. Any new approaches will be unsuccessful, however, unless and until they incorporate the human measure fragment to promote quality of work over quantity of author and/or article citations.