

Citation pattern and lifespan: a comparison of discipline, institution, and individual

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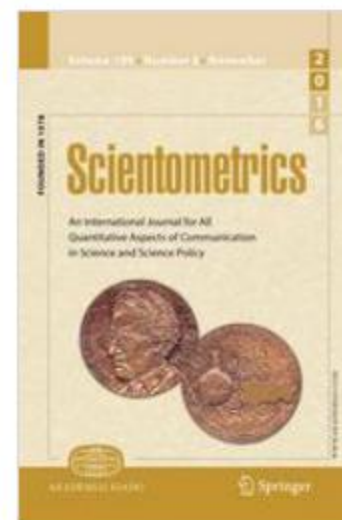
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Description

Scientometrics is concerned with the quantitative features and characteristics of science and scientific research. Emphasis is placed on investigations in which the development and mechanism of science are studied by statistical mathematical methods.

The journal publishes original studies, short communications, preliminary reports, review papers, letters to the editor and book reviews on scientometrics. Due to its fully interdisciplinary character, the journal is indispensable to research workers and research administrators . It provides valuable assistance to librarians and documentalists in central scientific agencies, ministries, research institutes and laboratories.

Scientometrics includes the Journal of Research Communication Studies. Consequently its aims and scope cover that of the latter, namely, to bring the results of such investigations together in one place.



Impact Factor	Available
2.084	1979 - 2016
Volumes	Issues
109	336

Given the variety of factors that influence citation rates, the objectives of this study were to (1) identify the influence of discipline, institution, journal impact factor, length of article, number of authors, seniority of author, and gender on citation rate of top-cited papers for faculty in geography and forestry departments across ten major public universities in the United States; (2) within this same population compare self-citation practices and (3) compare the patterns of citation frequency that a paper received over its post-publication lifespan. Our goal is to provide administrators and faculty members in positions of promotion decisions with a quantifiable basis for understanding the biases in citation that exist within these two disciplines.

Methods

For each faculty member ($N = 223$), we used Web of Science (copyright by the Institute for Scientific Information of Thomson Reuters) to identify the single first-authored publication for each faculty member that had received the highest number of citations.

Data analysis

Welch's t-test for samples with unequal variance. (forestry vs. geography)

analysis of variance to compare the mean citations across institutions.

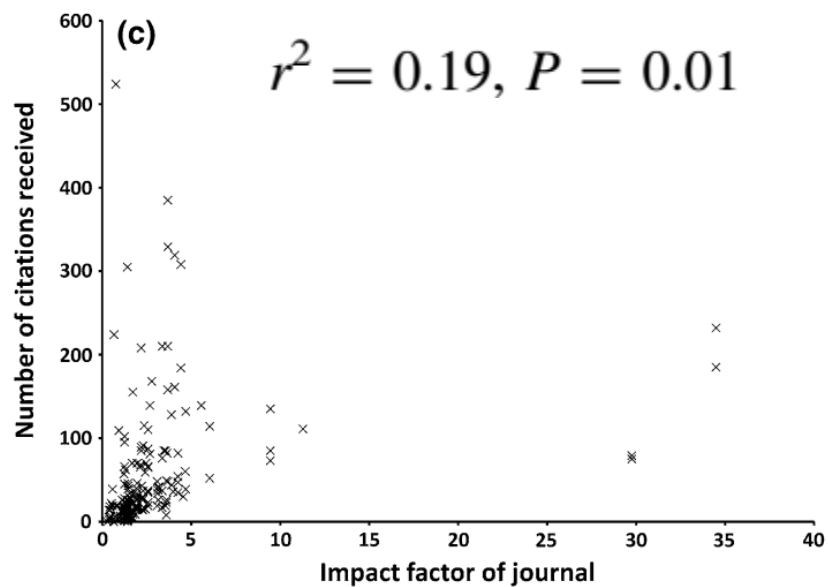
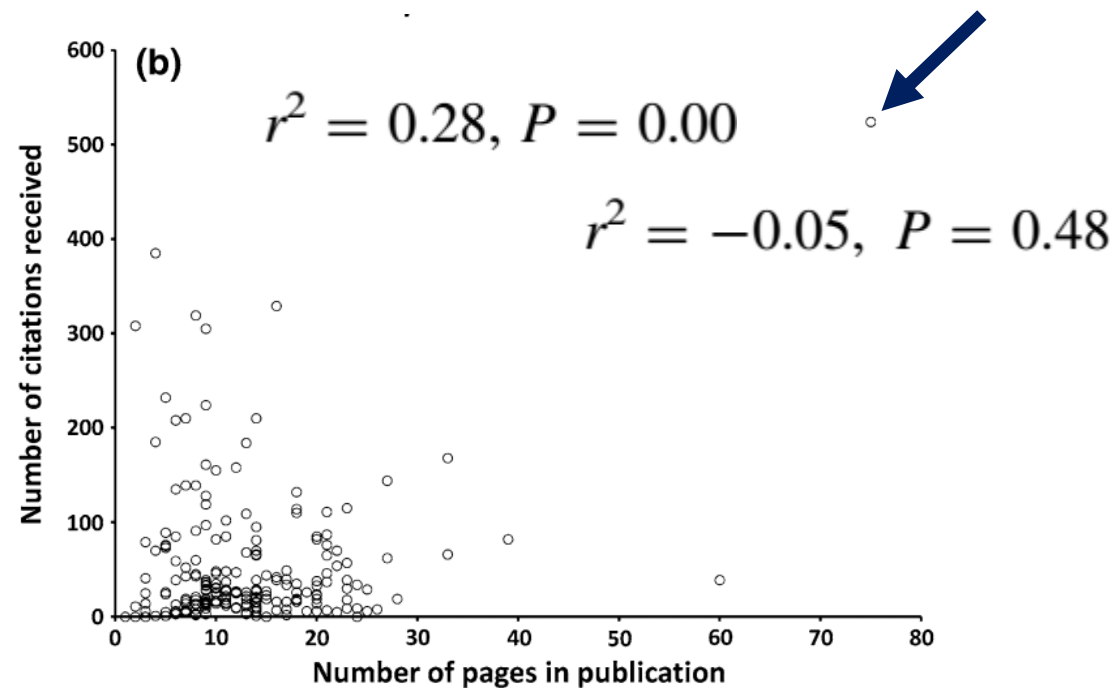
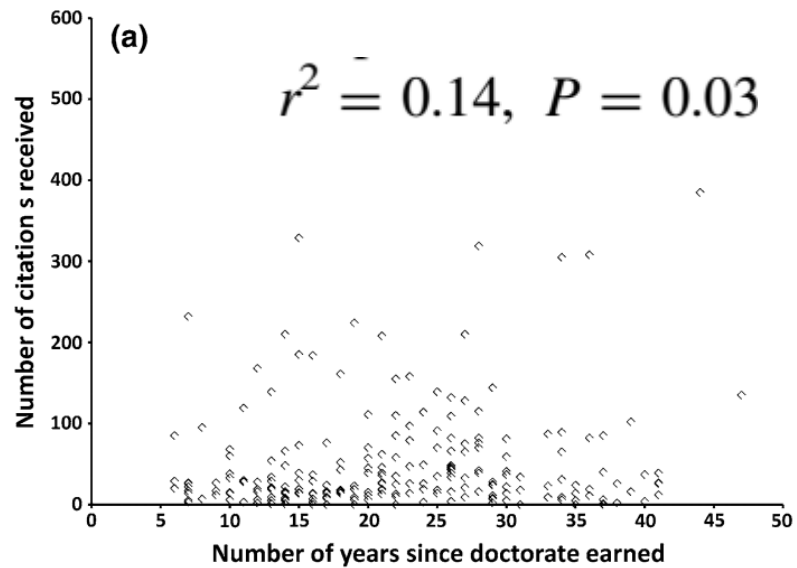
To compare differences in citation rate in relation to time since doctorate earned, number of authors, number of pages, and impact factor of journal we calculated a Pearson's correlation coefficient between these variables and the number of citations.

Table 1 Mean number of citations per paper and sample size by discipline, gender, and institution

Item	Mean	Number of samples
Discipline*		
Forestry	61.31	122
Geography	40.23	91
Gender^{NS}		
Female	55.41	44
Male	52.22	169
Institution^{NS}		
University of Washington	76.61	38
Michigan State University	66.88	16
Northern Arizona University	64.71	14
Pennsylvania State University	64.30	27
University of Massachusetts	62.82	17
University of Florida	54.14	25
Virginia Tech	41.67	18
Auburn University	40.55	20
Texas A&M University	37.52	23
Oklahoma State University	11.87	15

Results

* indicates significant difference in this category at $P > 0.05$ and NS indicates no significant difference existed within a category



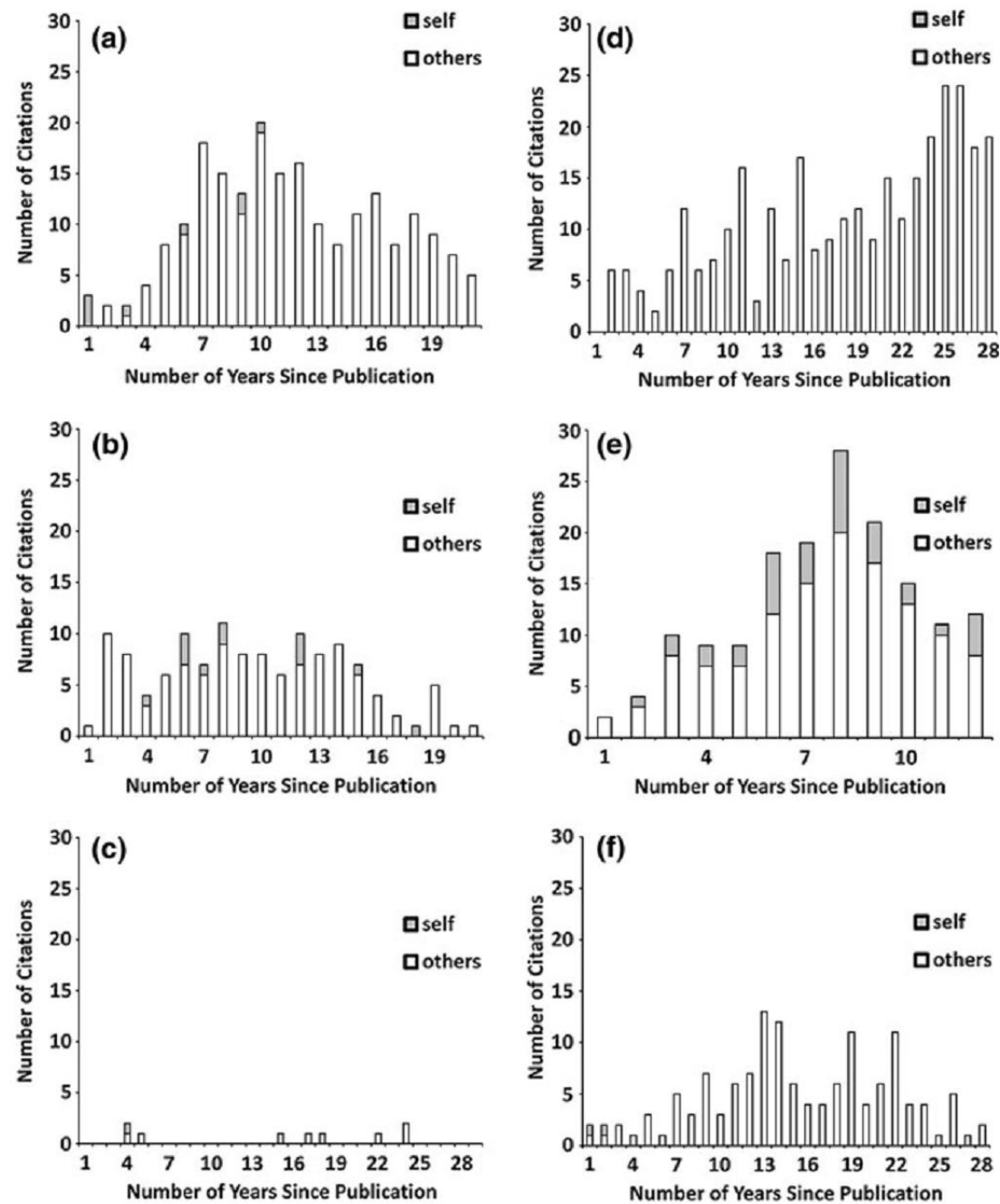
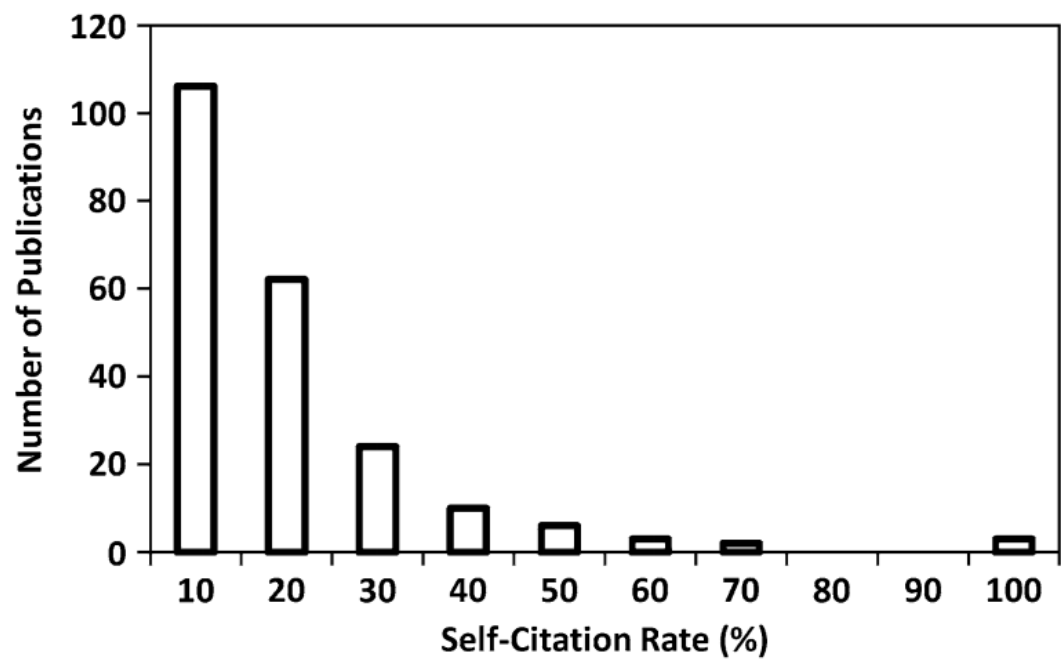


Fig. 3 Number of total citations (self and other) since year of publication

Discussion

In geography and forestry, we found no existence of gender bias in citation rates

This has been explained by frequent co-authorship among male and female authors, improved equality between the male and female researchers in the workplace, and because the authorship gender may not be known or considered when citing other's research (Xie and Shauman [1998](#); Copenheaver et al. [2010](#)).

Geographers had significantly lower citation rates than foresters

explanation for this difference could be that geographers, particularly cultural geographers, are more likely to communicate their research through books rather than journal articles and this form of communication would not be identifiable through Web of Science. Another reason could be that geography journals tend to have lower impact factors which leads to a smaller audience and fewer citations (Quiring [2007](#); Sarmiento and Butler [2011](#)).

An author's institutional affiliation had no significant influence on citation rate

larger universities provide greater opportunities for scientists to collaborate and work
Our study used universities that were all major land-grant universities, while,
other studies have included a wider range

Discussion

Authors who have been working in a discipline longer receive more citations than those who are new to the discipline

Scientists who are unable to produce high-quality work are generally removed from the profession, leaving a cohort of senior scientists who all have the proven ability to produce high-quality work. It is not actually age that determines citation rate, but rather that senior scientists are a smaller population that produces higher quality publications than the larger population of junior scientists who have a higher variability in the quality of their work.

Positive correlations between the number of authors and the citation rate

article's connection to the broader professional network of many authors instead of the smaller network of a single author. Co-authorship may also result in papers that cross more disciplines and thus are cited across more research areas. Additionally, there are higher levels of self-citation associated with co-authored articles

However, among foresters and geographers, we found no significant relationship between the number of authors and the citation rate.

Ajá y ¿qué pasó acá?

¿Para qué utilizar este estilo?

Discussion

Article length may be indicative of quality because only those articles perceived to be of higher quality by the editor will be allocated a greater number of pages in journals (Leimu and Koricheva 2005). Bornmann and Daniel (2008) suggest that longer publications, as measured by number of pages, are cited more often because they have more content that may be cited. Longer articles also tend to be more visible, particularly in hardcopy journals, making them more likely to be cited (Leimu and Koricheva 2005). However in our analysis, we found no significant correlation between article length and citation rate (Fig. 1b). This lack of correlation may be explained by shorter articles presenting clear, accessible, and concise arguments, which cancels out the influence of page length on citation frequency (Varian 1997).

Discussion

In this study we found a significant, positive relationship between journal impact factor and number of citations

This is also demonstrated by the correlation coefficient (0.28) identified in this study, which although significant, was substantially lower than correlation coefficients identified in other disciplines. In physics the correlation coefficient between mean citations per article and impact factor of the journal was 0.94 and in biology it was 0.99 (Vieira and Gomes 2010)—indicating a much closer connection between citations and journal ranking than was identified in forestry and geography.

Authors cite their own papers because it establishes their authority in the field and builds on their earlier work, rather than for self-promotion (Bonzi and Snyder 1991). In slight contrast, authors cite others' papers to demonstrate their knowledge of important findings in the field (Bonzi and Snyder 1991).

Conclusions

Our analysis shows that for geographers and foresters working at large, public universities citation rates of their most highly cited paper depend upon journal ranking, seniority of author, and discipline. Faculty cannot change their seniority or discipline, but it appears that the best publication strategy for junior faculty to achieve the professional recognition of their scholarship required for promotion is to publish in highly ranked journals.