I. What and who is an Expert?

**Definition:** “one with the special skill or knowledge representing mastery of a particular subject” (Merriam-Webster, 2022)

**Reflection:** Think of someone you deem an expert in your field of study; what has led you to giving them that label?

**Discussion:** In the sciences, how do we determine when someone is an expert? What attributes contribute to that title?

II. Role of citations in academic research

A. Why do researchers cite?

“Scholarship is a conversation and scholars use citations not only to give credit to original creators and thinkers, but also to add strength and authority to their own work. By citing their sources, scholars are placing their work in a specific context to show where they “fit” within the larger conversation. Citations are also a great way to leave a trail intended to help others who may want to explore the conversation or use the sources in their own work.” (guides.lib.uw.edu)

B. Choosing which material to cite

**Reflection:** Think about your own writing; how do you decide what material to cite? Does that differ by the subject matter; within your primary field of study vs. outside your primary field of study?

**Discussion:** When starting to write a paper, what are some steps you go through to find citations? How does that influence what gets cited?

C. H-index as a proxy for ‘impact’

The h-index is determined from two metrics: the number of publications by a scientist and the number of times those publications have been cited. It is therefore thought to be a proxy of productivity (papers published) and recognition (citations). The higher the h-index, the greater a scientist’s supposed academic impact.

“One downside is that it can deter researchers from innovative thinking. For instance, a student working under a professor with a high h-index may be reluctant to question the concepts they are being taught, as they are likely to assume the professor is an expert in their field based on their score. …The quest for a high h-index can also encourage researchers to choose ‘hot’ research topics that are more likely to gain attention and tempt them to publish one paper after another in an effort to boost their score. “It’s a little too sensitive to what’s popular and fashionable in science,” says Hirsch. The more a paper is cited, the harder it becomes to question its validity, he notes.” (Conroy, 2020)
D. Beyond citations: Altmetrics

“We rely on filters to make sense of the scholarly literature, but the narrow, traditional filters are being swamped. However, the growth of new, online scholarly tools allows us to make new filters; these altmetrics reflect the broad, rapid impact of scholarship in this burgeoning ecosystem.”
(altmetrics.com/manifesto)

III. Biases in Citations

A. Citation bias by perceived prestige

Articles in ‘high impact’ journals tend to accumulate more citations.

“The impact factor of the original publishing journal was more important than any other variable [to predict the frequency of citations], suggesting that the journal in which a study is published may be as important as traditional measures of study quality in ensuring dissemination.” (Callaham, 2002)

The cost to publish in high impact journals can also be a significant hurdle to scientist in low and middle income countries; Nature open access rate:$11,390, Cell open access rate: $5,900 (Else, 2020)

B. Citation bias by perceived gender

1. Number of citations per article is generally lower for women.

In medical journals: “Original research articles written by women as primary authors had fewer median (interquartile range) citations than articles written by men as primary authors… Articles written by women as both primary and senior authors had approximately half as many median (interquartile range) citations as those authored by men as both primary and senior authors…” (Chatterjee, 2021)

2. Women tend to have fewer self-citations.

“Men cited their own papers 56 percent more than did women. In the last two decades of data, men self-cited 70 percent more than women. Women are also more than 10 percentage points more likely than men to not cite their own previous work at all.” (King, 2017)

“results indicate that papers with high self-citation rates and high MNCS journal scores are less likely to be led by female authors than male authors in all samples.” (Anderson, 2019)
"We find that self-citation is the hallmark of productive authors… As a result, papers by authors with short, disrupted, or diverse careers miss out on the initial boost in visibility gained from self-citations. Our data further suggest that this disproportionately affects women because of attrition and not because of disciplinary under-specialization." (Mishra 2018)

IV. What can we do as early career scientists?

Clearly using citations as a proxy for scientific impact and expertise is flawed, but it is still a metric used in assessing scientists.

“Overall, these studies point to factors in which individual action could help do away with unfair systems, says Dani Bassett, a systems neuroscientist at the University of Pennsylvania who co-authored one of the recent physics studies as well as the study of neuroscience citations. One strategy, which Bassett’s team employs, is to quantify the proportion of men- and women-authored papers researchers cite in a study using tools like the Gender Balance Assessment Tool and include that information as a diversity statement. This, Bassett points out, not only informs of the citation parity in a study, but also signals a commitment to diversity, equity, and inclusion. “These are areas where we can make a lot of change without having to convince specific leaders, which I think is really empowering for people in academia.”” (Lopez Lloreda, Science 2022)

Tool: Gender Balance Assessment Tool:  https://jlsumner.shinyapps.io/syllabustool/

A. Be mindful of the sources we choose to cite; are we selecting them based on their science or based on their prestige?

B. If you haven’t reached the citation limit for an article, think about additional citations that support your narrative that are not commonly represented.

V. References


“Citing Sources: What are citations and why should I use them?”
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