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Issues in Publishing, Editing, and Reviewing

The Psychology of Referencing in Psychology Journal Articles

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ABSTRACT—*Citation statistics can affect major professional decisions, but little is known about how important a particular reference is to the citing document. We asked 49 psychologists to rate the importance of every reference in their own empirical paper and to indicate the primary citation reason. References cited for conceptual ideas or to justify methods and data analyses were regarded as more important than references cited for general background, limitations, or future research. The location, frequency, and length of a citation predicted its importance, but such relationships were weaker for self-citations. We make suggestions about referencing for authors, editors, and bibliographic database designers.*

A common quantitative measure of the quality of a research paper is how frequently it is cited. Citation counts can be used to evaluate individual researchers for hiring, promotion, and awarding grants and prizes, as well as to evaluate the research quality of larger units, such as academic departments, research institutes, and even nations. Citation analyses can inform decisions about areas worth funding and about which journals to purchase. In psychology, citation analysis has been used to enhance understanding of the intellectual genealogy of ideas, the development of interdisciplinary and collaborative scholarship, and the relationship of psychology to other disciplines (e.g., Cacioppo, 2007; Roediger, 2006).

Despite the potential importance of citation analysis for major issues in academic psychology, there are only a few studies in which psychologists were asked to indicate why they cited particular references. Shadish, Tolliver, Gray, and Gupta (1995) asked journal authors to indicate their reasons for citing a randomly selected reference in their article. A key finding was that highly cited works were considered exemplars for a genre of studies in a field. However, making judgments about only one

reference in an article minimizes the impact of context effects, as the decision to cite a given reference depends in part on the other references in the citing document. Moreover, the journal authors in Shadish et al. were not asked to evaluate the importance of the reference for their specific article.

In contrast, we (Tang & Safer, 2008) randomly selected 49 recently published empirical articles in psychology from science/social-science citation databases and asked the lead authors to rate every reference in their own article for its importance to the research paper and to indicate both the primary reason for citing that reference and their relationship, if any, to the author of the reference. (We also queried authors of 50 randomly selected biology articles. The data are similar but are not discussed here.) We correlated importance ratings with various textual features of the citation, such as how much detail about the reference was cited in the article, what section of the paper it was cited in, and how frequently it was cited. Each article had at least 35 references.

Using a scale of 1 (*slightly important*) to 7 (*absolutely important*), the average rating for citation importance was 4.91 for psychology. Although participants regarded the cited references as relatively important to the paper, 80% of citations were listed only in parentheses, with no mention in the text, and another 11% were barely mentioned in the text. Only 9% of citations were quoted or had at least one point discussed thoroughly. Similarly, Adair and Vohra (2003) found that over the past 40 years there has been an explosion in both psychological knowledge and in the number of cited references in psychology journal articles. One way that authors increased the number of references was to group undiscussed citations rather than elaborate on solitary citations.

On average, Tang and Safer (2008) found that 65% of references in psychology articles were cited in the introduction, 17% in the method section, 7% in the results section, and 25% in the discussion section. The percentages exceeded 100% because some references were cited in more than one location. One characteristic of proper scientific papers is that references are not just concentrated in the introduction, but are instead distributed throughout the article, so that “every stage of the doc-

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ument both relies on and relates to the work of others" (Swales, 1990, p. 115).

The location of a cited reference predicted the author's rated importance of that reference to the study. References cited in either the method, results, discussion sections, or both the introduction and discussion sections, all tended to be judged as more important than references that were cited just once in the introduction. Citation frequency and various related measures such as citation length and depth were also positively associated with the rated importance of that reference for the article. However, the importance of a cited reference depended in part on characteristics of other citations in the articles (context effects). Like the proverbial big fish in a small pond, a reference cited multiple times was regarded as particularly important for an article if there were relatively few other references cited multiple times.

The reason for citing a reference was also related to its judged importance for the paper. References cited for reasons of conceptual ideas or to justify methods and data analyses were regarded as more important than references cited for general background, limitations, or future research. Here, the context effect indicated that a reference cited for a conceptual idea was judged as being particularly important if there were relatively few other references cited for conceptual ideas.

An author's relationship to a cited author also predicted that citation's judged importance for the paper. Self-citations, including citations to a paper by a coauthor, were regarded as more important than citations to authors who were known only by reputation or were unknown. There was a particularly interesting interaction involving self-citations. Quantitative characteristics of a reference, such as the number of times it was cited in an article, predicted the author's judgment of importance better for non-self-citations than for self-citations. Participants judged their own prior research as very important for the current article even if they cited it just once and in the introduction. Thus, the relationship between citation frequency and judged importance was relatively "magnitude sensitive" for non-self-citations and relatively "magnitude insensitive" for self-citations. This finding fits well with psychological research on dual-process, cognitive, and affective heuristics that individuals use to relate stimulus magnitude and subjective valuation (Hsee, Rottenstreich, & Xiao, 2005). Participants seemed to use a calculation-based process for evaluating the importance of references by others and a different, more feeling-directed process to evaluate the importance of their own work.

What are some of the implications of these findings for the field of psychology? Citing references consumes journal pages that are then unavailable for other articles. Moreover, a "hypercritical manuscript review process" (Adair & Vohra, 2003, p. 18) encourages authors to include more references, particularly in the introduction, for the sake of credibility and appearance, rather than for specific substance. For example, we found that 46% of the references described by the authors as being cited for

"general background" occurred in the introduction. Information scientists would describe many of these as perfunctory citations as opposed to organic ones (Moravcsik & Murugesan, 1975; White, 2001). We defined perfunctory citations as those that occurred just once and in the introduction. Our participants generally indicated that the primary reason for these perfunctory citations, which constituted 19% of all citations, was "general background." Perhaps the manuscript reviewing process should discourage overuse of perfunctory citations. For example, compared with psychology articles, we found that biology articles had a smaller percentage of their references in the introduction, and they had roughly as many cited references in the discussion as in the introduction (Tang & Safer, 2008).

Self-citations were generally not perfunctory citations. Our participants tended to rate self-citations as highly important, with the primary reasons being to justify conceptual ideas and/or methodological or quantitative techniques rather than being for general background or other reasons. Overall, self-citations were more likely than other citations to be discussed in some length rather than simply mentioned in the text.

Given that authors do not regard all references as equally important to their paper, we suggest a more sophisticated method of counting citations to estimate quality. For example, if an item is cited only once and only in the introduction, it should be weighted less than those cited multiple times and in locations such as the method, results, or discussion sections. Self-citations should be distinguished from citations to others, but with the knowledge that authors tend to regard self-citations as being relatively important regardless of their location and citation frequency.

Our study suggests that citation textual property, such as citation frequency, treatment, and location, can be useful predictors of an author's judgment about that citation's importance in a specific article. Currently, bibliographic databases such as PsycINFO, Science Citation Index, and Social Science Citation Index support the cited author, cited work, or cited reference searches. However, what the records provide are limited citation frequency counts or simply a cited reference list of a given article. We suggest these databases include more citation meta-data information such as where the citation occurs and how many times it was cited within a given article. Such a system will also give CWIC (Citation Words in Context) windows, similar to KWIC (Keyword in Context), in order to provide users more information about the role of the citation to the citing document. Given the potential importance of citation counting in vital individual and disciplinary decisions, we should try to encourage the development of the most sensitive and accurate measures of research quality.

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