Literature Searching Strategies of Integrative Research Reviewers

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Psychological Abstracts and the *Educational Resources Information Center* (ERIC) identify documents as "literature review," or a variant thereof. The trend over time for both databases is for an increasing percentage of documents to be assigned this descriptor (cf. Cooper, 1985). Most of this increase for *Psychological Abstracts* has occurred since 1979, when 1.3% of documents were called literature reviews compared to 4.3% in 1983.

The only methodological aspect of reviewing that has received prolonged attention concerns meta-analysis, or how quantitative research results can be integrated. Reviewing's most characteristic activity, conducting the literature search, has been neglected. The survey reported below sought to (a) describe how authors locate material for reviews and (b) discover correlates of searching strategies and citation practices. (A complete report is available from the author.)

One hundred and twelve first authors of research reviews published during 1982 and 1983 were asked to participate in the survey. Authors were identified through (a) computerized searches of PsycINFO and *ERIC*, (b) a library search of books publishing research reviews (e.g., books with "annual review," "advances," "review of research," or "handbook" in the title), and (c) announcements of information

analysis products published by ERIC clearinghouses. Of the 112 requests, 57 returned questionnaires were from authors who said the first or second goal of their article was to integrate empirical research. Eighteen of these reviews were from psychology journals, 13 from education journals, 16 from books, and 10 from clearinghouses.

Authors of reviews showed marked variations in expertise. Eight authors (14%) said the review was their first directly relevant publication in the topic area (having published no prior books, empirical studies, or nonempirical articles); eight others claimed over 20 directly relevant publications. Eighteen reviewers (32%) characterized themselves as "a leader in the topic area," 19 (33%) as "an active, continuing contributor or systematic worker in the area," 11 (19%) as "a contributor to other areas but new to this area," 7 (12%) as "a first contributor," and 2 (3.5%) as "a practitioner whose field is relevant to the topic."

Twenty authors (35%) said they hoped to comprehensively cover the literature, 12 (21%) hoped to include most but not all material, and 25 (44%) intended to cover representative or central material only. Twenty-one reviewers (37%) said they stopped their literature search when they felt they had found everything relevant, 33 (58%) stopped when they felt their understanding of the topic would not be affected by additional material, and 9 (16%) stopped when retrieval became unacceptably difficult.

Three aspects of the reviewers' strategies for locating research were measured by asking (a) what sources of research were accessed, (b) how useful the sources were, and (c) how "significant" or "central" to the article the works found through each source were. Fifteen different ways of locating research were listed. Authors checked the sources they used, and then ranked the utility and centrality of the references they found through each source. Table 1 presents the results of the three questions.

Table 1
Use, Utility, and Centrality of Different Sources of References

Use[a]	Utility[b]	Source of references	Centrality[c]
53	2.7	References in review papers written by others	2.6
47	3.9	References in books written by others	3.4
44	4.8	Communication with people who typically share information with you	4.3
40	3.3	References in nonreview papers from journals you subscribe to	3.4
35	2.6	Computer search of abstract data bases (e.g., ERIC, *Psychological Abstracts*)	3.1
32	4.0	Manual search of abstract data bases	4.5
31	4.0	References in nonreview papers you browsed through at the library	4.3
22	6.1	Informal conversations at conferences or with students	5.6
20	5.4	Formal requests of scholars you knew were active in the field (e.g., solicitation letters)	4.5
18	5.6	Topical bibliographies compiled by others	5.6
15	6.3	Browsing through library shelves	5.8
9	7.3	Comments from readers/reviewers of past work	5.5
8	4.0	Manual search of citation index	3.1
5	4.5	Computer search of citation index (e.g., SSCI)	3.7
5	7.2	General requests to government agencies	5.2

[a] "Use" is the number of reviewers (out of 57) who said they used the source to locate references. [b] "Utility" is the average ranking of the source with regard to the number of references it yielded (only by authors who used the source). [c] "Centrality" is the average ranking of the source with regard to the significance or centrality of the references it yielded (only by authors who used the source).

The most frequent strategy reviewers employed was to examine the references provided by previous reviewers. Computer searches of abstracts appear to be making significant inroads on reviewing practices, and reviewers who use computer searches find them extremely useful. Citation indexes are not often employed by reviewers, but authors who do use them report that the references they yield are central to their topic. The average reviewer employed nearly seven different search strategies.

An important question is whether authors who use one strategy also tend to use other strategies. A principal components factor analysis followed by an equamax rotation was performed on the question concerning whether the reviewer used the 15 different sources of references. Three factors with eigenvalues greater than 1 emerged from the analysis.

The factor analysis identified three distinct approaches to searching the literature. The bibliographic approach placed a heavy emphasis on the use of searches compiled by others (either human or computer). The personal contact approach relied on information given directly to the author by other scholars in the field (plus reliance on the author's own journal network). The manual approach involved the reviewer performing most of the "legwork," by tapping primary printed sources. Knowing that an author used one approach gave no indication of whether another approach was also employed.

Journal articles were by far the most frequently cited type of document (53% of all citations). Books and book chapters together accounted for 24.7% of citations, and all other types of doc-

uments (e.g., government reports, dissertations) accounted for 22.3% of references. On average, the authors indicated that 37.5% (SD = 28.6%) of citations were to material they were unfamiliar with before undertaking the review.

Several composite variables were created to uncover relations among author expertise, coverage intentions, search strategies, and citation practices, and these composite variables were correlated with one another.

Reviewers who intended to more comprehensively cover the literature tended to use fewer personal contact strategies to locate material, $r(55) = -.22$, $p < .094$. Likewise, reviewers who said they stopped their literature search only when they felt they had uncovered everything relevant used fewer personal contact strategies than reviewers who stopped for other reasons, $r(55) = -.44$, $p < .0008$. Use of the other search strategies was not significantly related to coverage intentions.

Coverage intentions were also related to the author's expertise. Authors with more numerous relevant publications were somewhat less likely to say they intended to exhaustively cover the literature, $r(55) = -.22$, $p < .08$, and were somewhat more likely to say they stopped searching the literature when new material would not have affected their conclusions, $r(55) = .23$, $p < .09$. The authors' self-ratings of their standing in the field showed similar but lower correlations with coverage strategy.

The expertise of the author and the search strategies the author employed revealed two interesting relations. Authors with more numerous relevant publications tended to be less likely to use manual search strategies, $r(55) = -.24$, $p < .074$, whereas authors claiming higher standing in the field were more likely to use personal contact strategies to locate material, $r(55) = .30$, $p < .025$.

The percentage of new citations in a review correlated with several other review characteristics. Among these, authors who said they cited a higher percentage of new works were more likely to use bibliographic search strategies, $r(53) = .27$, $p < .05$, and less likely to use personal contact strategies, $r(53) = -.43$, $p < .001$. Authors with less expertise were more likely to cite a higher percentage of new references—for number of publications, $r(55) = -.25$, $p < .07$; for standing, $r(55) = -.42$, $p < .002$.

With regard to types of citations, reviewers who cited a higher percentage of books reported intending less comprehensive coverage, $r(55) = -.33$, $p < .02$, used more personal contact search strategies, $r(5) = .22$, $p < .10$, and tended more often to stop the search when their understanding would have been unaffected by new material, $r(55) = -.23$, $p < .084$. More use of bibliographic search strategies was associated with a lower percentage of citations to journal articles, $r(55) = -.26$, $p < .05$, and a higher percentage of citations to other materials, $r(55) = .27$, $p < .05$. Neither expertise variable was associated with the percentages of different types of references.

A final set of analyses examined whether the characteristics of reviews published in psychology journals differed from reviews published in other outlets. In general, authors of book chapters were more expert than authors of psychology journal reviews. Also, authors of psychology journal reviews were more likely than other authors to say they stopped their search only when they had retrieved all the relevant information. However, psychology journal authors generally used bibliographic searches less often than other authors and used all types of searches less often than education journal authors.

Much of the interrelationship among review characteristics might be explained by the existence of two distinct kinds of reviews: (a) a comprehensive review published in a journal carried out by a relative newcomer to a field who used bibliographic and manual search strategies and (b) a selective review published in a book written by an expert using personal contacts to find referenced works. The newcomers wrote reviews not only to be published but also to acquaint themselves with the research areas. The expert, perhaps writing the review because it was solicited by an editor, already felt familiar with the area and wrote primarily to direct future research.

One implication of the survey is that authors need to state explicitly what their reviews are meant to accomplish and how the reviews were carried out (see Cooper, 1984). Otherwise, the variety of intentions and strategies may make it difficult for readers to discern the appropriate context for evaluating whether the review fulfilled its mission.

REFERENCES

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