

# Literature reviews

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Whether it be a thesis or a paper, it is normal practice to begin with a literature review. The aims of these reviews can vary, however, and how they are tackled depends upon their purpose. Literature reviews can:

- show the history of a field;
- review the work done in a specific time period – for example ‘The annual review of . . .’;
- plot the development of a line of reasoning;
- integrate and synthesise work from different research areas;
- evaluate the current state of evidence for a particular viewpoint;
- reveal inadequacies in the literature and point to where further research needs to be done.

These different purposes define and control how and where writers search for the relevant information to review. Typically, researchers start by following up the references provided in several key papers and then proceed to the Internet (see Fink, 2005). The accumulating information (it never ceases) can be filed – electronically or in paper-based folders (see Chapter 4.1). If it is appropriate, it is also helpful at this stage to email or write to the authors of original papers to obtain copies of the materials used in experimental studies for, in my experience, the brief descriptions of such materials in journal articles do not do them justice.

## **STRATEGIES FOR PRESENTING RESULTS IN REVIEWS**

There are at least six ways of presenting summaries of the results of research reviews, which can be placed along a continuum of statistical precision.

- 1 *The narrative review*: This is the kind of review that is typically used in this book. Writers research around a particular topic and then write a

review of the field, giving their own 'take' on it, selecting evidence from whatever seems appropriate to them. This type of review is most common in text-books and popular journals. I once provided a case-history account of how to write such a review that was motivated by the need to rebut a claim by the UK government that primary school children benefited from doing homework (Hartley, 2000). The government had used spurious claims in order to specify how many hours each week children in primary school should spend on homework.

- 2 *The narrative review with scoreboard*: Here, writers strengthen the arguments of their reviews by supporting the claims made with tabular 'scoreboards'. Table 3.3.1 shows an example (with fictitious data).
- 3 *A scoreboard plus details*: Table 3.3.2 shows an example (with limited data) of how more detail can be provided in a scoreboard. The advantages of listing individual studies in different categories are that it enables the reader to trace the studies should they wish and, if they are familiar with the field, to see if any have been omitted.

Table 3.3.1 A 'scoreboard' giving the number of studies that show homework has an effect at different ages\*

	<i>No. of studies showing that homework has or does not have an effect</i>	
	Yes	No
Primary school studies	1	6
Secondary school studies	10	3

\* Fictitious data.

Table 3.3.2 An extract from a more detailed (unpublished) 'scoreboard'

	<i>Studies showing that homework has an effect</i>	
	Yes	No
Primary school	Alton-Lee and Nuthall (1990)	Cooper <i>et al.</i> (1998) Levin (1997) Miller <i>et al.</i> (1993)
Secondary school	Cooper <i>et al.</i> (1998) Holmes and Croll (1989) Keith and Benson (1992) Rutter <i>et al.</i> (1979) Tymms and FitzGibbon (1992) Zellman and Waterman (1999)	Faulkner and Blyth (1998) Mau (1997) Wharton (1997)

\* With many references left out to save space.

- 4 A 'scoreboard' showing critical features: A common method of summarising results, particularly used in theses and dissertations, is to provide a table listing the key features of the studies being discussed. Table 3.3.3 provides a simplified and fictitious example. Such tables take a good deal of time to construct, but they can be enormously helpful for readers. The information provided in such tables also means that key information (e.g. the numbers and the ages of the participants, and the place of study) is not omitted, as often occurs in narrative reviews. Indeed, a series of such tables can be presented, each dealing with one particular feature in turn.
- 5 *Meta-analytic 'scoreboards'*: Meta-analysis involves pooling the results that can be found from all the known studies on a given topic. Sometimes this number of studies is very high (e.g. studies of the effects of television), and sometimes it is quite small (e.g. studies of the effects of homework). The aim, however, is to arrive at an overall summary of the results for the topic in question.

To conduct a meta-analysis, all of the studies known to the researcher (or team of researchers) are accumulated, and the results are averaged according to certain rules. This usually involves, first of all, discarding a number of studies that do not include sufficient data, or the right kind of data (see below). Then, for each one of the remaining studies, the mean score of the control group is subtracted from the mean score of the experimental group, and the result is divided by the standard deviation of the control group (or both groups combined). Finally, the results obtained in step two are averaged over all the studies. The ensuing result is expressed in terms of an 'effect size' that indicates the importance of a particular variable. Table 3.3.4 provides an example from the field of homework. Effect sizes are typically interpreted as follows: 0.0 = no effect; 0.2 = small effect; 0.5 = medium effect; 0.8 = large effect. Thus, in Table 3.3.4, the effects of homework get larger as the children get older.

Table 3.3.3 A 'scoreboard' with critical features\*

Study	Age group	Number of pupils	Subject matter	Length of study
Abba (1988)	5–7 yrs	20 per year	Arithmetic	1 week
Becca (1997)	7–8 yrs	2,0000	Varied	3 months
Cedda (2001)	6 yrs	10	Reading	7 weeks
Deffa (1999)	11–12 yrs	25 per year	English	8 weeks
			Maths	
Egga (1996)	12–14 yrs	13 per year	Science	1 week
Fehha (2005)	15–16 yrs	21 per year	English	8 weeks
			Maths	
			Science	

\* Fictitious data.

Table 3.3.4 Effect sizes for studies of the effectiveness of homework

	<i>Homework versus no homework</i>	<i>Homework versus supervised study</i>	<i>Time spent on homework</i>
Primary school	0.15	0.8	0.04
11–14 years	0.31	0.24	0.14
15–17 years	0.64	0.33	0.53

Adapted with permission from Cooper and Valentine (2001). © Taylor & Francis, [www.informaworld.com](http://www.informaworld.com).

Some people think that such meta-analytic reviews are superior to narrative reviews, but others provide criticisms (see Fink, 2005). To carry out a meta-analysis you need to know the sample sizes and the means and standard deviations of the experimental and control groups in every study included. This stricture, of course, excludes qualitative studies, and these studies can make important contributions. Student performance in homework is undoubtedly related to what they and their parents think about it. There is also some debate over whether or not some studies should be excluded from the averaging procedure – say on the grounds of limited sample sizes – but with meta-analytic studies it is usual to include all of the studies that one can. Some studies, however, do compare the results obtained with different procedures. Anderson's (2004) meta-analytic review of the effects of violent video games, for example, contrasted the results obtained when all of the studies known to the author were included with those obtained from a smaller sample of better studies. In this case the better studies yielded higher effect sizes.

- 6 *Evidence-based 'scoreboards'*: With the 'evidence-based' approach, more studies are excluded on particular methodological grounds when making the overall summary of the results. In medical research, for example, it is usual to exclude comparison studies where the participants have not been allocated at random into experimental and control conditions. However, it is difficult to do this in all areas of study, and randomised controlled trials (RCTs) are rare in social science research. Torgerson *et al.* (2003), for example, were only able to find twelve RCTs in 4,555 reported investigations into improving adult literacy and/or numeracy, and, I know of no RCTs on the topic of homework.

The criteria for including studies in evidence-based studies have thus got wider for disciplines in the social sciences compared with medicine, but there are still many strictures concerning what should and should not be included in reviews of this kind (see Andrews, 2005). The importance of the evidence-based approach becomes more obvious when the overall picture obtained from RCTs is different from that obtained

from studies using other, less stringent methods. Guyatt *et al.* (2000), for example, found that the pooled results from ten studies using RCTs in the field of sex education for adolescents showed no significant effects for the treatments overall, whereas the pooled results from seventeen non-RCT studies showed the treatments to be effective . . .

## SOME PROBLEMS

There are a number of problems in reviewing the literature that apply to all of the above strategies. First of all, there is what is sometimes called the 'file-drawer' problem. This relates to the fact that it is easier to publish studies that have statistically significant findings than it is to publish ones that do not, and so the latter get filed away. Torgerson (2006) calls this 'the Achilles heel' of systematic reviews, but it applies to all attempts to review the literature in any field.

Next, there is the problem of interpreting the findings of the published studies and seeing if these findings are relevant to your review. Research papers summarise a great deal of time and effort in a few pages. Reviewers summarise these papers in a few lines. Different reviewers emphasise different aspects of the same studies, and thus their accounts vary. Hartley (2000, pp. 166–7), for example, cites four different accounts of one particular study on homework. Readers reading only one of these may be misled.

Relatedly, it may be more difficult to summarise adequately the results of qualitative studies. Dixon-Woods *et al.* (2006) discuss this at length in the context of summarising evidence-based studies and come to the conclusion that this really is a tricky problem.

Finally, there are some other assumptions made in literature reviews that do not withstand close scrutiny. These are:

- 1 that different dependent variables (manipulated by different investigators in different studies but designed to test the same hypotheses) are of equal validity or importance;
- 2 that the results obtained in one culture (e.g. American) are directly relevant to another one (e.g. British) and can thus be pooled together;
- 3 that the results obtained in one period (e.g. the 1960s) are the same as those that would be obtained today;
- 4 that the results obtained from limited samples (e.g. schoolchildren) apply to wider populations (e.g. adults); and
- 5 that the results obtained in simplified experiments apply to the much more complex 'real world'.

When writing a literature review, one solution to some of these problems is to examine in more detail the original papers and, in particular, the original

materials used in the papers being reviewed. There are few examples of reviewers using such strategies – although it is clearly advisable to do so when writing the literature review in theses. Hartley *et al.* (1980) provided three such illustrations. One, by Macdonald-Ross (1977), concluded that Vernon's (1946) results on the effectiveness of diagrams arose largely as a consequence of her using poorly designed diagrams. Similarly, Elashoff and Snow (1971) were able to write a devastating critique of *Pygmalion in the Classroom* after examining the tests and procedures used by Rosenthal and Jacobson (1968). And finally, Klare (1976) read thirty-six studies on the effects of readability upon the comprehension of text. Nine of these were published papers, and twenty-seven were unpublished theses. Klare found that 100 per cent of the published studies contained statistically significant findings, compared with sixty per cent of the dissertations. This, of course, altered the nature of his review, and his conclusions.

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