Abstracts

The abstract, although it heads the article, is often written last, together with the title. This is partly because writers know what they have achieved, and partly because it is not easy to write an abstract. Abstracts have to summarise what has been done, sometimes in as few as 150 words.

It is easier to write an abstract if you remember that all abstracts have a basic structure. Indeed, the phrase 'structured abstracts' says it all. This kind of abstract, common in medical research journals and now appearing in many social science articles, can be adapted for most normal purposes.

STRUCTURED ABSTRACTS

Structured abstracts are typically written using five sub-headings – 'background', 'aim', 'method', 'results' and 'conclusions'. Sometimes the wording of these sub-headings varies a little – 'objectives' for 'aim', for example, but the meaning is much the same.

Structured abstracts were introduced into medical research journals in the 1980s. Since then they have been widely used in medicine and other areas of research (Nakayama *et al.*, 2005). In 2004, I published a narrative review of their effectiveness based upon thirty-one research papers available at that time (Hartley, 2004). I concluded that, compared with traditional abstracts, structured abstracts:

- contained more information
- were easier to read
- were easier to search
- facilitated peer review for conferences
- were generally welcomed by readers and by authors.

Figure 2.3.1a below shows a typical structured abstract. Figure 2.3.1b shows the same abstract written with the sub-headings removed. It can be seen that both abstracts are clear, and so it is useful to write an abstract in

Background. In 1997 four journals published by the British Psychological Society began publishing structured abstracts.

Aims. The aim of the studies reported here was to assess the effects of these structured abstracts by comparing them with original versions written in a traditional, unstructured format.

Method. The authors of the articles accepted for publication in the four journals were asked to supply copies of their traditional abstracts (written when the paper was submitted for publication) together with copies of their structured abstracts requested by the editor when their paper was accepted. Forty-eight such requests were made, and thirty pairs of abstracts were obtained. The abstracts were then compared on a number of measures.

Results. Analysis showed that the structured abstracts were significantly more readable, significantly longer and significantly more informative than the traditional ones. Judges assessed the contents of the structured abstracts more quickly and with significantly less difficulty than they did the traditional ones. Almost every respondent expressed positive attitudes to structured abstracts.

Conclusions. The structured abstracts fared significantly better than the traditional ones on every measure used in this enquiry. We recommend, therefore, that editors of other journals in the social sciences consider adopting structured abstracts.

Figure 2.3.1a An original abstract in structured form.

Adapted from Hartley and Benjamin (1998), and reproduced with permission of the British Journal of Educational Psychology. © the British Psychological Society.

a structured form first, and then to adjust it for the journal you are writing for if this journal does not use them.

Figures 2.3.1a and b illustrate some of the virtues of structured abstracts. Using the sub-headings and the appropriately spaced typographical layout makes the content clearer (Hartley and Betts, 2007). Furthermore, structured abstracts are easier for readers to scan, as every abstract follows the same format. The sub-headings thus allow the readers to go to the same place each time in an abstract to find out what it says. Furthermore, as the information required has to be provided by the author under each sub-heading, nothing gets missed out. With traditional abstracts, it is all too common to find that some elements are missing – the background, the method or the results, for example. Often one is left saying, 'So, what happened?' or 'So what?'.

In 1997 four journals published by the British Psychological Society began publishing structured abstracts. The aim of the studies reported here was to assess the effects of these structured abstracts by comparing them with original versions written in a traditional, unstructured format. The authors of the articles accepted for publication in the four journals were asked to supply copies of their traditional abstracts (written when the paper was submitted for publication) together with copies of their structured abstracts requested by the editor when their paper was accepted. Forty-eight such requests were made and thirty pairs of abstracts were obtained. The abstracts were then compared on a number of measures. Analysis showed that the structured abstracts were significantly more readable, significantly longer and significantly more informative than the traditional ones. Judges assessed the contents of the structured abstracts more quickly and with significantly less difficulty than they did the traditional ones. Almost every respondent expressed positive attitudes to structured abstracts. In short, the structured abstracts fared significantly better than the traditional ones on every measure used in this enquiry. We recommend, therefore, that editors of other journals in the social sciences consider adopting structured abstracts.

Figure 2.3.1b The same abstract in unstructured form.

Many people think that structured abstracts are only suitable for empirical papers – those with 'methods' and 'results'. As one of my correspondents put it:

> It seems to me that the format you have chosen imposes a unitary conception of research, at a time when educational research in particular, and social science more widely, has at last broken away from narrow strictures of method and procedure.

However, I believe that the underlying characteristics of a structured abstract can apply to many other forms of enquiry. Figure 2.3.2a, for example, shows an original abstract written to accompany a review paper. Figure 2.3.2b shows a revision of it that, in my view, makes the background, aims and conclusions of the study more explicit.

Bayley and Eldredge (2003) provide references to a variety of papers in the health sciences that have structured abstracts. These include qualitative studies, narrative reviews, systematic reviews, meta-analyses and randomised controlled trials. Table 2.3.1 similarly lists some more recent papers in the

There is something of a controversy taking place over how best to theorise human learning. In this article we join the debate over the relationships between sociocultural and constructive perspectives on learning. These two perspectives differ in not just their conceptions of knowledge (epistemological assumptions) but also in their assumptions about the known world and the knowing human (ontological assumptions). We articulate in this article six themes of a nondualist ontology seen at work in the sociocultural perspective, and suggest a reconciliation of the two. We propose that learning involves becoming a member of a community, constructing knowledge of various levels of expertise as a participant, but also taking a stand on the culture of one's community in an effort to take up and overcome the estrangement and division that are consequences of participation. Learning entails transformation of both the person and the social world. We explore the implications of this view for thinking about schooling and for the conduct of educational research.

Figure 2.3.2a An original abstract for a review paper.

Reproduced with permission from Packer and Goicoechea (2000) and Taylor & Francis, www. informaworld.com.

health and social sciences that have used structured abstracts with a variety of research methods.

After the title, the abstract is the most frequently read part of any paper. Writing it in a structured format (with or without the headings) ensures that it is informative and complete.

Table 2.3.1 Examples of studies with structured abstracts published in the health and social sciences

Method	Example
Literature review	Mayhew and Simpson (2002)
Observational study	Lauth *et al.* (2006)
Survey	Wilding and Andrews (2006)
Longitudinal study	Flouri (2006)
Statistical paper	Prosser and Trigwell (2006)
Simulation	Wright (2006)
Experimental study	Clariana and Koul (2006)
Epidemiological study	Evans (2000)
Meta-analysis	Bunn *et al.* (2006)
Systematic review	Duperrex *et al.* (2006)
Qualitative study	Maliski *et al.* (2002)

Background. An interesting debate is currently taking place among proponents of different ways of thinking about human learning. In this article we focus on that portion of the debate that addresses sociological and constructive perspectives on learning. These two perspectives differ in not just their conceptions of knowledge (epistemological assumptions) but also in their assumptions about the known world and the knowing human (ontological assumptions).

Aims and approach. We wish to try and reconcile these two different approaches first by examining the ontological assumptions of them both. We then consider six key themes of a nondualist ontology seen at work in the sociocultural perspective. Finally we propose that the constructive perspective attends to epistemological structures and processes which the sociological perspective must place in a broader historical and cultural context.

Conclusions. We conclude that learning involves becoming a member of a community, constructing knowledge of various levels of expertise as a participant, and taking a stand on the culture of one's community in an effort to take up and overcome the estrangement and division that are consequences of participation. Learning entails transformation of both the personal and the social world. We explore the implications of this view for thinking about schooling and the conduct of educational research.

Figure 2.3.2b The same abstract in structured form.

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Chapter 2.4

Key words

Key words typically:

1   allow readers to judge whether or not an article contains material relevant to their interests;

2   provide readers with suitable terms to use in web-based searches to locate other materials on the same or similar topics;

3   help indexers/editors group together related materials in, say, the end-of-year issues of a particular journal or a set of conference proceedings;

4   allow editors/researchers to document changes in a subject discipline (over time); and

5   link the specific issues of concern to issues at a higher level of abstraction.

WHO USES KEY WORDS?

There appear to be no formal requirements for key words, no rules for formulating them, little guidance on how to write them, and no instructions for reviewers on how to assess them. This is surprising in view of the fact that, presumably, a wise choice of key words increases the probability that a paper will be retrieved and read, thereby potentially improving citation counts and journal impact factors. Table 2.4.1 shows, however, that there are typical disciplinary differences in the percentage of journals using key words.

Table 2.4.1 The approximate percentages of research journals in different areas and disciplines supplying key words

Arts	Education	Psychology	Science	Medicine	Statistics
5	20	30	50	50	75

Hartley and Kostoff (2003).

WHO CHOOSES THE KEY WORDS?

Table 2.4.2 shows that there are several different ways of choosing key words. The most common method (used by over fifty per cent of authors) is for them to supply as many words as they choose (within bounds), but sometimes a specified number of words is required (often about six). The next main method (used by about twenty per cent of authors) is for them to choose key words that fit into categories already prescribed by the journal's 'instructions to authors'. Thus, for example, authors generating key words for medical articles often have to select only words from the medical subject headings (MeSH) taxonomy – a structured taxonomy used by MEDLINE. In situations like this the number of words allowed and the number of categories to choose from can vary. Many psychology journals, for example, ask authors to list key words from any of the 5,000 terms that appear in the American Psychological Society's *Thesaurus of Psychological Index Terms*. Finally, key words are sometimes generated automatically at proof stage (as is the case for the *Journal of Information Science*, where the key words are derived from *Library and Information Science Abstracts*).

HOW TO SELECT KEY WORDS

Gbur and Trumbo (1995) published a list of ways of producing effective key words and phrases. Table 2.4.3 provides an abbreviated version.

It is possible that, with future developments, all of these problems will actually disappear. As one colleague has put it, 'Inverted-full-text-Boolean indexing and online searching (with similarity algorithms and citation-

Table 2.4.2 Different methods for supplying key words

Authors supply them with no restrictions on the numbers allowed.

Authors supply up to a fixed number (e.g. six).

Authors supply key words as appropriate from a specified list.

Editors supplement/amend authors' key words.

Editors supply key words.

Editors supply key words from a specified list.

Referees supply key words from a specified list.

Key words are allocated according to the 'house-rules' applied to all journals distributed by a specific publisher.

Key words are determined by computer program at proof stage.

Hartley and Kostoff (2003).

Table 2.4.3 Ten ways to produce effective key words and phrases

1   Use simple, specific noun clauses. For example, use *variance estimation*, not *estimate of variance*.
2   Avoid terms that are too common. Otherwise the number of 'hits' will be too large to manage.
3   Do not repeat key words from the title. These will be picked up anyway.
4   Avoid unnecessary prepositions, especially *in* and *of*. For example, use *data quality* rather than *quality of data*.
5   Avoid acronyms. Acronyms can fall out of favour and be puzzling to beginners and/or overseas readers.
6   Spell out Greek letters and avoid mathematical symbols. These are impractical for computer-based searches.
7   Include only the names of people if they are part of an established terminology, for example *Skinner box, Poisson distribution*.
8   Include, where applicable, mathematical or computer techniques, such as *generating function*, used to derive results, and a statistical philosophy or approach such as *maximum likelihood* or *Bayes' theory*.
9   Include alternative or inclusive terminology. If a concept is, or has been, known by different terminologies, use a key word that might help a user conducting a search across a time-span, or from outside your speciality. For example, the statistician's *characteristic function* is the mathematician's *Fourier transform*, and in some countries *educational administration* is *educational management*.
10 Note areas of applications where appropriate.

ranking) will soon make keywords and human-subject-classification a thing of the past'. Put more simply, this means that we will soon be able to input any words, pairs of words or phrases that we like from an article into a search engine and come up with related materials. Unfortunately, of course, this also means that the searcher is likely to be swamped with information – most of which will be inappropriate. If, for example, you use Google Advanced Scholar to search for 'key words', you will obtain approximately 800 citations.

All of this suggests that considerable thought needs to go into the selection of key words. Borrowing from Hughes (2005), it might be worth considering selecting words from a series of categories such as:

- discipline: for example economics, management, psychology, education
- method: for example experiment, case study, questionnaire, grounded theory
- data source: for example primary, secondary, tertiary students, senior citizens
- location: for example country, town, institution
- topic: for example academic writing.

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Chapter 2.5

Introductions

It is but a short step from structured abstracts to structured texts. In the following chapters we shall see how each part of the structure of a scientific article (the introduction, method, results, discussion and conclusion) can indeed be subdivided into finer structures.

Swales and Feak (2004) describe what they characterise as 'moves' in the various sections of academic articles. Basically, a 'move' is a stage in the argument that all writers go through. The 'moves' for the introduction are typically as follows (p. 244):

- *Move 1*:   The authors establish a research territory:
    (a) by showing that the general research area is important, central, interesting, problematic or relevant in some way (optional);
    (b) by introducing and reviewing items of previous research in the area (obligatory).
- *Move 2*:   They then establish a 'niche' by indicating a weakness in the account so far:
    (a) by indicating a gap in the previous research, raising a question about it or extending previous knowledge in some way (obligatory).
- *Move 3*:   They then occupy the niche by saying they are going to put this right:
    (a) by outlining the purposes or stating the nature of the present research (obligatory);
    (b) by listing research questions or hypotheses to be tested (optional);
    (c) by announcing the principal findings (optional).

Swales and Feak argue that most introductions to academic articles follow this basic structure. Lewin *et al.* (2001) offer a similar, but more detailed, analysis that readers might also find useful.

AN EXAMPLE

While writing this section of *Academic Writing and Publishing*, I coincidentally received a copy of a paper by Slatcher and Pennebaker (2006). This paper was about the effects of one of the partners of a dating couple writing either neutral or strongly emotional letters to the other one about their relationship. The paper concluded that the participants who wrote the emotional letters were significantly more likely to be dating their romantic partners three months later than were the writers of the neutral letters. Be that as it may, I was intrigued to observe that the introduction to this paper followed almost exactly the generic structure described by Swales and Feak.

Slatcher and Pennebaker's introduction contains five paragraphs. Here are some examples of how the moves appear:

Move 1: Establishing a research territory

The paper starts (paragraphs 1 and 2) with describing the background and setting the scene. Key phrases are: 'Researchers are now . . .', 'Preliminary findings suggest . . .', 'There are a number of ways in which one could measure the effects of expressive writing . . .'.

Move 2: Establishing a niche

The paper continues (in paragraphs 3 and 4) with the following key phrases: 'Although previous studies have addressed . . . none have . . .', 'One potential mediator is . . .', 'There are various ways to measure . . .', 'The use of emotional words may be particularly relevant . . .', 'One way is to analyse the texts used in instant messaging . . .'.

Move 3: Occupying the niche

The introduction concludes (in paragraph 5) with the following key phrases: 'In the present study we sought to investigate the social effects of expressive writing . . .', 'Three predictions were tested. First . . .'.

Slatcher and Pennebaker thus follow Swales and Feak's analysis almost line by line. It is also worth noting, in passing, that the literature review in this paper is quite short, and there are only nine references. Day and Gastel (2006) comment that, 'Introductions should supply sufficient information to allow the reader to understand and evaluate the results of the present study without (them) needing to refer to previous publications on the topic' (pp. 57–8).

Of course many papers are written with more detailed substructures. Three types of structure typical in introductions are:

1   The one listed above – where the authors establish their niche by indicating limitations or omissions in the previous research.
2   One where two (or more) different areas of research are reviewed – and the authors establish their niche by bringing them together.
3   One where some previous research has provided support for a particular finding or theory, and some has not – and the authors establish their niche by seeking to resolve and explain this.

Further, there are disciplinary variations: Haggan (1998), for example, examined the introductions for twenty-six articles in the sciences, twenty-six in linguistics and twenty-six in the arts. She found that the introductions in the science papers were less likely to contain a plan for the paper than were the introductions in linguistics, and that they lay midway in their use of impersonal language between introductions in the arts (the least personal) and introductions in linguistics (the most personal). Introductions in the sciences were more personal, however, when there was more than one author.

Such disciplinary formulaic introductions enhance the clarity of a paper and ensure that the readers' expectations about the format and the purpose of an introduction are maintained. Such devices keep the reader reading.

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Chapter 2.6

Methods

Method sections vary in journal articles, but rather less so than introductions. This is because the 'moves' in the method sections generally involve working through a series of subsections. Most method sections are usually subdivided (with subheadings) into three sections, as follows:

1   participants
2   measures
3   procedure(s).

If no participants are involved, then the method simply describes the measures and procedure(s). In the Slatcher and Pennebaker (2006) example, there are three subheadings in the method section: Participants, Procedure and Linguistic Analysis (or measures).

Method sections may be brief and succinct – when the methods used are well known and standardised – or quite lengthy, when the methods used are new or different and thus require careful elaboration.

Students and authors are typically instructed to write their method sections in such a way that readers can repeat the method from the descriptions given. Day and Gastel (2006, p. 64) recommend that colleagues unfamiliar with what was done should be asked to read the account to see if they can follow it. Authors are sometimes too close to what they did and thus tend to forget to mention tiny but – sometimes – key details.

A useful device for clarifying the procedure or the method for the reader – especially if it is complicated – is to summarise it in a table or figure (e.g. see Gotzsche, 2006). Figure 2.6.1 gives a schematic version of Slatcher and Pennebaker's prose description of their method. Such procedures, though, are rarely used. None of the authors of fifty-six articles in the 2005 volume of the *Journal of Educational Psychology* used this strategy, and only two provided illustrations of the equipment used. However, eleven (i.e. twenty per cent) of these articles did include figures to illustrate either the theoretical models underlying the reasoning for their experiments or the analyses that they were going to use.
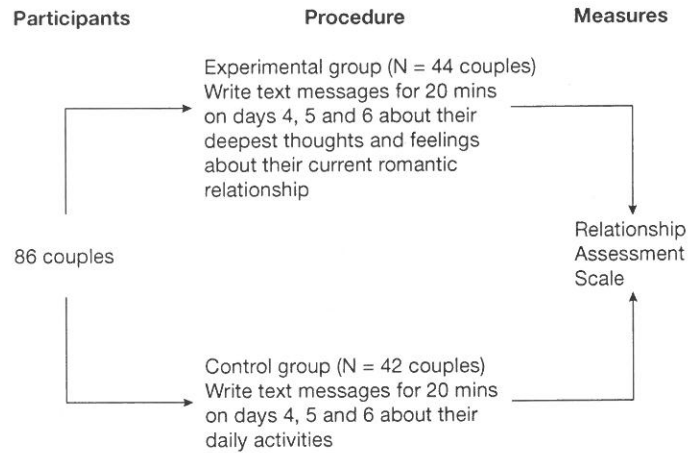
Participants   **Procedure**   **Measures**

Figure 2.6.1 A schematic illustration of the prose version of the Method used in the study by Slatcher and Pennebaker (2006).

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Chapter 2.7

Results

A 'moves' analysis of the results sections of academic articles either looks like this:

- *Move 1*: State the main findings in order – relating them in turn to the hypotheses and methods used.
- *Move 2*: State the subsidiary findings – relating them in turn to the hypotheses and methods used.

or it is an interweaving of the two – the first set of main findings and related subsidiary ones, followed by the second set, and so on.

Again these subsections may be cued by subheadings. Slatcher and Pennebaker (2006), for example, divide their results section into two main parts (separated by the subheadings, 'Relationship stability and language use', and 'Mediation effects of changes in use of emotional words'). They provide a description of the results obtained, mainly in prose, in each part, indicating that the partners who wrote the romantic letters were significantly more likely to be dating their romantic partners three months later than were the partners who wrote the neutral ones.

It is typical in results sections to present the main data that support (or reject) the hypotheses in the form of tables and graphs. Indeed, it is quite common to find that the first sentence of a results section begins, 'Table 1 shows that . . .'. Slatcher and Pennebaker's paper is unusual here in that they provide only one such table, near the start of their second section of results, and this table is not used to illustrate their main findings. Because tables and graphs are so important in academic and scientific writing, I shall discuss them separately, in more detail, in Chapter 3.5.

Salovey (2000) argues that the art of writing a good results section is to take the readers through a story. This does not mean working step by step through the results obtained, but rather – as implied above – articulating what happened and illustrating it clearly, usually with data. In my view, this story is clearer if the sequence of topics addressed in the results section is the same as that articulated in the introduction and the method(s) sections.

Swales and Feak (2004) comment that the distinction between the results and the subsequent discussion section is not always as sharp as one might think. They cite a study by Thompson (1993) that showed that the authors of papers in biochemistry used a variety of rhetorical devices in their results section to justify their methodology, to interpret and comment on the findings, and to relate them to previous research. Indeed, the only thing that they did not do in their results sections was to call for further research – this was left for the discussion.

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Chapter 2.8

Discussions

Discussions, like introductions, have a typical structure. Lewin *et al.* (2001) and Swales and Feak (2004) describe typical 'moves' in the discussion sections of academic research papers. Putting these descriptions together suggests the following moves:

- *Move 1*: Restate the findings and accomplishments.
- *Move 2*: Evaluate how the results fit in with the previous findings – do they contradict, qualify, agree or go beyond them?
- *Move 3*: List potential limitations to the study.
- *Move 4*: Offer an interpretation/explanation of these results and ward off counter-claims.
- *Move 5*: State the implications and recommend further research.

Discussions, then, go beyond a summary of the findings and, indeed, there may be disciplinary differences in how they are approached. Holmes (1997), for instance, found that the discussion sections of papers in sociology and political science were similar in format to those in the sciences, whereas those in history were less complex. Swales and Feak (2004) state that some scientists believe that a long discussion implies weak methods and results, whereas social scientists and people in the arts may well believe the opposite.

AN EXAMPLE

Lewin *et al.* (2001) provide numerous quotations from the discussion sections of several research articles to support the above 'moves' analysis. In terms of Slatcher and Pennebaker's (2006) paper referred to earlier, we may note the following sentences contained in the six paragraphs of their discussion section:

- *Move 1*: Restating the findings and accomplishments:
  - Par. 1: 'The very simple act of writing about their romantic relationship changed the way in which participants communicated . . .';
  - Par. 2: 'Taken together these findings shed light on processes underlying interactions in close relationships . . .';
  - Par. 3: 'An advantage of the current design is that . . .';
  - Par. 6: 'Unlike previous expressive-writing studies, this is the first to demonstrate . . .'.
- *Move 2*: Evaluating how the results fit in with previous research:
  - Par. 3: 'In particular, the findings relating to increases in emotion words illuminate previous research [3 references provided]'.
- *Move 3*: Stating the limitations:
  - Par. 5: 'There are some potential limitations in this study. First . . . Second . . .'.
- *Move 4*: Warding off alternative explanations:
  - Par. 5. '. . . make this an unlikely possibility'.
- *Move 5*: Stating implications:
  - Par. 4: . . . [this finding] 'has clear implications for clinicians';
  - Par. 5: '. . . future studies should address this issue'.

These quotations illustrate that the five moves are present, but they are not as clearly sequenced or indicated as might be implied from the list above. Authors seem more flexible in how they tackle their discussions, although the moves listed are usually present.

Discussion sections are difficult to write because their aim is to discuss and comment on the findings, rather than just to report them. Day and Gastel (2006) suggest that journal editors reject many papers because of their weak discussions. They recommend that discussions should end with a short summary regarding the significance of the work, which, they claim, is not always adequately considered.

Woods (1999) recommends:

1   that writers should keep notes about what it might be useful to include in the discussion as ideas occur to them when they are writing other sections; and
2   that it might be wise to set aside a day or two to tackle this section of the paper.

This, he says, will make the task less daunting.

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Chapter 2.9

Acknowledgements

Most academic articles contain acknowledgements to various sources of help received during their preparation, although one editor of my acquaintance steadfastly deletes them on the grounds that they add nothing to the content. However, I believe that it is courteous to thank sources of financial support and colleagues and referees for their help in improving articles. Slatcher and Pennebaker conclude:

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>
> (Slatcher and Pennebaker, 2006, p. 663)

Suls and Fletcher (1983) counted the acknowledgements to colleagues in papers in chemistry, physics, psychology and sociology, with the number of acknowledgements adjusted for the number of authors of the papers. (The number of joint authors was highest in physics and lowest in sociology.) Suls and Fletcher found that the proportion of acknowledgements to colleagues increased as one moved through the disciplines from chemistry to sociology.

More recently, Cronin *et al.* (2003) examined the acknowledgements in all of the several hundred articles published in the *Psychological Review* and in *Mind* from 1900 to 1999. In both journals, there was an upswing in the percentage of articles with acknowledgements – from the 1960s for *Psychological Review* and from the 1980s for *Mind* – until 1999, when almost ninety per cent of their articles contained them. Cronin *et al.* (2004) then repeated their analyses with samples from the *Journal for the American Chemical Society*. Here the upswing started earlier (in the 1940s) and over ninety per cent of the articles in this journal have contained acknowledgements since the 1960s.

Cronin *et al.* (2003) separated the different parts of an acknowledgement as follows:

- *financial* (recognition of extramural or internal funding);
- *instrumental/technical* (providing access to tools, technologies, facilities, and also furnishing technical expertise, such as statistical analysis);
- *conceptual* (source of inspiration, idea generation, critical insight, intellectual guidance, assistance of referees etc.);
- *editorial* (providing advice on manuscript preparation, submission, bibliographic assistance etc.); and
- *moral* (recognising the support of family, friends etc.).

Table 2.9.1 shows the relative proportions of these categories in the acknowledgements in the three journals examined by Cronin *et al.* (2003; 2004). These data reveal clear disciplinary differences, and they also tell us indirectly something about the intellectual debts incurred in writing a paper.

However, even *within* disciplines, a closer examination of the acknowledgements can reveal interesting things (see Cronin and Franks, 2006; Hartley, 2003). It appears, for example, that – in psychology – there are differences in the numbers of acknowledgements given by single authors compared with those given by pairs or trios of authors. In one study, for example, I examined the acknowledgements made in the *Journal of Educational Psychology*, *Teaching of Psychology* and *Psychological Science* (Hartley, 2003). Here fifty-seven per cent of single authors acknowledged the help of colleagues, referees and editors, compared with forty-nine per cent of pairs and forty per cent of trios. It appeared then that single authors benefited from discussions with other colleagues – who were acknowledged – more than did pairs or groups of writers who were perhaps in a better position to discuss salient issues among themselves.

In all of the studies described above, the authors worked by hand when counting the elements in the data. However, automated methods for analysing acknowledgements are now available and, with these, larger samples from many more journals can be considered. Giles and Councill (2004), for example,

Table 2.9.1 **The proportions of acknowledgements (%) devoted to different aspects of acknowledgements in** Mind, Psychological Review **and the** Journal of the American Chemical Society

	Mind	*Psychological Review*	*Journal of the American Chemical Society*
Financial	11	36	46
Technical	4	20	34
Conceptual	69	31	18
Editorial	11	11	1
Moral	1	–	–

Data derived from Cronin et al. (2003; 2004) and reproduced with permission of the authors.

carried out one such automated study of 188,052 acknowledgements in science papers. They showed that funding agencies got the highest rates of acknowledgements, commercial companies the next, educational institutions the third, and individuals the least. More interesting, perhaps, is that it will soon be relatively easy, using such computer-based techniques, to trace which people are acknowledged most in a given field, and thus to assess their currently hidden contribution, and also to see if acknowledgements to colleagues are reciprocal in different papers.

Finally, Day and Gastel (2006) remind us that it is always appropriate to check with the people named in acknowledgements that they are happy with what is said and, if necessary, to reword it in the light of their comments. Indeed, some journals require that all the people listed in the acknowledgements, as well as all the authors, each sign separate consent forms allowing publication.

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Many different styles of referencing have developed over the years. National standards have been agreed in the USA, UK, Europe and China. However, few publishers appear to follow these standards precisely, perhaps because they each allow some degree of choice. Today variation seems rife, and this is made worse by computer-based systems for preparing references, such as EndNote, Procite and Reference Manager. EndNote (2007) proudly boasts that it includes 'more than 2,300 predefined bibliographic styles for leading journals', although quite why anyone should want such a number is anybody's guess.

Currently there are four main styles of referencing for academic articles, as follows:

1   The APA style. This system is also known as the Harvard or, more colloquially, as the 'name(date)' system. This is because an author's surname in the text is followed by the date of the publication in brackets, and entries in the reference list are listed alphabetically, starting with the name and the initials of the author(s) followed by the date of publication for each entry. For example:

> Sharples, M. (Ed.). (1993). *Computer supported collaborative writing.* London: Springer-Verlag.
> Speck, B. W., Johnson, T. R., Dice, C. P., & Heaton, L. B. (1999). *Collaborative writing: An annotated bibliography.* Westport, Connecticut: Greenwood Press.
> Tang, C. (1998). Effects of collaborative learning on the quality of assignments. In B. Dart & G. Boulton-Lewis (Eds.), *Teaching and learning in higher education* (pp. 102–23). Melbourne: Australian Council for Educational Research.
> Zammuner, V. L. (1995). Individual and co-operative computer writing and revising: Who gets the best results? *Learning and Instruction*, 5(2), 101–24.

2   The Modern Languages Association (MLA) style. In this version the authors' surnames (with or without the dates) appear in the text and the first author's surname comes first in the reference list. This is followed by his or her first name, but first names then come first for any additional authors. Dates of the publications are given after journal titles, or at the end of the references for books, etc. The list is ordered alphabetically. For example:

Sharples, Michael (Ed.). *Computer Supported Collaborative Writing*. London: Springer-Verlag, 1993.
Speck, Bruce W., Teresa R. Johnson, Catherine Dice, and Leon B. Heaton. *Collaborative Writing: An Annotated Bibliography*. Westport, Connecticut: Greenwood Press, 1999.
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Zammuner, Victoria L. 'Individual and co-operative computer writing and revising: Who gets the best results?' *Learning and Instruction* 5 (1995) 101–24.

3   The Institute of Electronic and Electrical Engineers (IEEE) style. Here, the authors in the text are numbered in order of their appearance in the text, sometimes without their names, and the numbers are enclosed in square brackets. The reference list is then numbered sequentially. Names are presented with the initial(s) first, followed by surnames. Dates of the publications are given after journal titles, or at the end of the references for book, etc. Journal titles are sometimes abbreviated. For example:

[1] M. Sharples, Ed., *Computer Supported Collaborative Writing*. London: Springer-Verlag, 1993.
[2] V. L. Zammuner, 'Individual and co-operative computer writing and revising: Who gets the best results?' *Learning and Instruction*, vol. 5, no.2, pp. 101–24, 1995.
[3] C. Tang, 'Effects of collaborative learning on the quality of assignments,' in *Teaching and Learning in Higher Education*, B. Dart and G. Boulton-Lewis, Eds. Melbourne: Australian Council for Educational Research, 1998, pp. 102–23.
[4] B. W. M. Speck, T. R. Johnson, C. P. Dice and L. B. Heaton, *Collaborative Writing: An Annotated Bibliography*. Westport, Connecticut: Greenwood Press, 1999.

An alternative version is to list (and number) the authors *alphabetically* in the reference list, and to assign these numbers to the authors in the text as appropriate.

4   The Vancouver style, popular in medical journals, is named after its inception following agreements made during a meeting in Vancouver in 1987 by the International Steering Committee of Medical Editors. Here, as with the IEEE system, the authors are numbered in the text in order of their appearance, and the numbers are enclosed in square brackets. The reference list is numbered sequentially, but the authors are listed surnames first, followed by their initials. Again the dates of publications are given after journal titles, or at the ends of the references for books etc. The key feature of the Vancouver style is its 'spare' typography and punctuation, and the use of abbreviated journal titles.

For example:

1   Sharples M, editor. Computer supported collaborative writing. London: Springer-Verlag, 1993.
2   Zammuner VL. Individual and co-operative computer writing and revising: Who gets the best results? Learn Instruc 1995;5 (Pt 2): 101–24.
3   Tang C. Effects of collaborative learning on the quality of assignments. In: Dart B, Boulton-Lewis G, editors. Teaching and learning in higher education. Melbourne: Australian Council for Educational Research, 1998;102–23.
4   Speck BWM, Johnson TR, Dice CP, Heaton LB. Collaborative writing: an annotated bibliography. Westport, CT: Greenwood Press, 1999.

Each of these main referencing systems has advantages and disadvantages for both readers and authors. Some key points are, first, that the name(date) system clutters the text when long lists of references are given. For example, twenty names and dates might be cited in a row, whereas in the numbered system one simply puts [1–20]. Incidentally there seems to be some confusion here in the name(date) system over whether or not these lists of names and dates should be cited in alphabetical or historical order. I recommend one or the other (but not a mixture, as sometimes is the case). Second, it is difficult for readers to judge the recency of an in-text reference in a numbered reference system. Third, in writing the text, getting all of the numbers in sequence is tedious, especially when revising or rewriting the text (if this is not computer-aided). Finally, abbreviated journal titles cause difficulty for readers and authors unfamiliar with the abbreviations.

REASONS FOR CITING REFERENCES

According to Robillard (2006), *students* are taught that 'the primary function of citing references is to avoid plagiarism by giving credit where credit is

due'. However, when it comes to publishing academic papers, the reasons for citing references increase. Robillard suggests that references:

- tell the readers where they can find the material being discussed;
- provide evidence for the writers' claims;
- draw the readers' attention to little-known or unknown work;
- indicate to the reader the scholarship of the writer:
  (a) by displaying erudition, and
  (b) through self-citation;
- show the writers' respect for particular people;
- align the author with particular schools of thought; and
- allow mutual grooming: colleagues cite colleagues and friends, and vice versa.

Indeed, there is a small research literature on the benefits or otherwise of making self-citations (e.g. see Fowler and Aksnes, 2007; Hellsten *et al.*, 2007). Fowler and Aksnes report (in a study of more than half a million citations made by Norwegian scientists) that the more one cites onself, the more one is cited by others.

CITING PAGE NUMBERS FOR QUOTATIONS IN THE TEXT

There is some debate in the literature about the necessity for citing in the text the page numbers of a quotation, table or figure from another article when giving a reference to it. Generally speaking, this is done more frequently in papers in the arts than it is in the sciences, and studies have shown that many science journals are lax in this respect (e.g. Donovan, 2006; Henige, 2006). Clearly the level of detail required for an in-text reference is a matter of debate, but the actual page numbers can be very helpful for readers if they want to check up on what was actually said or shown.

Sometimes it is not possible for writers to include the page numbers of a specific quotation because they are working from a prepublication electronic text and it is simpler to refer the reader to the final printed publication than to the unique resource location (URL) for the preliminary or alternative version. (This explains why there is no page number for the quotation from Robillard cited above!) Nevertheless, the moral of the tale, however tedious, is that it is best to include information rather than leave it out. Someone, somewhere, will want to check it.

USING APPROPRIATE STYLES AND REFERENCES

In most situations authors have no say in what reference system will be used, and they prepare their texts in accordance with publishers' demands. They do, however, have different aims and can use different referencing styles to match these, as shown in Table 2.10.1.

Historical analysis shows that referencing styles are not fixed and predetermined, and that incoming editors can and do make changes. *The British Journal of Psychology*, for example, started in 1910 with a footnote system and continued this until 1930. Between 1930 and 1950, a variety of systems were used within individual volumes: in 1930, for example, Volume 21 had mainly footnotes, but one article included a bibliography. In 1940, it was possible to find articles in the same volume:

(i) with footnotes;
(ii) with a numbered reference system and a sequential listing of the references; and
(iii) with an alphabetical listing of the references in a numbered sequence.

In 1953, the journal changed to the current name(date) system of referencing.

In other journals, such changes have been more abrupt. *The American Journal of Psychology*, for instance, used footnotes from 1887 until 1970 and then it changed to the name(date) system in 1971. *The American Psychologist* started life in 1946 with a numbered referencing system and an alphabetical listing of the references until it changed to the name(date) system in 1959. Connors (1999) cites similar changes in other APA and MLA journals, concluding that, ' the APA style now bids fair to become the de facto standard for all fields over the next five decades' (p. 232). Connors' judgement now seems premature.

Table 2.10.1 Writers' aims and preferred referencing styles

Aim	Style
To communicate to fellow colleagues/scholars	Style of own discipline
To communicate to a different (academic) audience	Style of that discipline
To communicate to a general academic audience	Style of journal chosen
To communicate to students within own discipline	Style of own discipline
To communicate to students generally	Few references needed
To communicate to the general public	No formal references needed

Reproduced from Hartley (2002) by permission of Sage Publications Ltd.

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Chapter 2.11

Footnotes

Some journals in some disciplines use footnotes as well as references. Footnotes are most commonly found in journals in the humanities and least in journals in the sciences, with social science journals somewhere in between. Footnotes serve the same purposes as references, as outlined by Robillard in the previous chapter (p. 60) perhaps more clearly. The differences are that they are sometimes more extensive than references, often containing more exposition, and they usually appear, as their name suggests, at the foot of the page. However, it is also common to find such notes at the end of a chapter, or even grouped chapter by chapter at the end of a book.

The use of footnotes has an ancient pedigree. Slomanson (1987) dates the first use of the term to 1822, but cites the use of footnotes occurring shortly after 1066. Grafton (1997) is more cautious. He writes, 'Scholars have placed the birth of the footnote in the twelfth century, the seventeenth, the eighteenth, and the nineteenth – never without good reason' (p. viii). Be that as it may, what appears to happen with many academic journals is that footnotes first appear in their early history, but that these are then replaced with numbered references, before finally a name(date) system takes over (as described in the previous chapter).

The literature on writers' and readers' attitudes to footnotes is long on anecdote and assertion, but short on evidence (Hartley, 1999). Two common assertions are:

(i)   that footnotes seem irresistible, and that they can thus distract the reader;[1] and

(ii) that it is sometimes difficult to find your place back in the main text to continue reading when you have moved away to read the footnote.

In order to obtain some data on feelings such as these, I once gave a questionnaire on the topic to approximately fifty academics whose disciplinary

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1   See what I mean . . .

journals typically used footnotes (e.g. law, history, education and English and modern languages), and to another fifty whose disciplinary journals typically did not (e.g. medicine, physics and psychology). The questionnaire asked these academics about:

1   their attitudes to footnotes generally;
2   their attitudes to footnotes being placed at the ends of individual chapters as opposed to the end of a book; and
3   their preferences for notes or references being placed at the ends of individual chapters in a book rather than at the end of the book (or vice versa) when the chapters were written:
    (a) by the same author, or
    (b) by different authors.

The results showed that both groups of academics responded positively to footnotes – that is, they did not find them irritating. However, as might be anticipated, the members of the 'footnotes' group were significantly more positive towards footnotes than were the members of the 'no-footnotes' group. The 'footnotes' group claimed that they had significantly less difficulty in returning to where they were on the page after reading a footnote, and that footnotes could be less easily ignored than did the 'no-footnotes' group.

However, the respondents in both groups agreed that:

1   notes at the ends of chapters or books were more irritating than notes at the foot of the page;
2   it was difficult to find your way back to where you originally were after reading a note at the end of a chapter or a book, as opposed to a note at the foot of the page; and
3   it was better to have notes or references at the end of each chapter (as here) rather than at the end of the book, especially when the chapters were written by different authors.

These findings suggest that readers attach greater significance to the value of footnotes and endnotes if they are used to reading them in their books and journals. They thus form an accepted way of conveying additional information within certain disciplines. However, for a more general audience, it might be best to avoid them.[2]

2   Caught you again?

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