

### WRITING YOUR CONCLUSION

Researchers vary in the format they use to wrap up their studies. Some only have a Discussion section, whereas others have both Discussion and Conclusion sections. You might also see additional subheadings, such as Summary and/or Implications. Some attach their Discussion section to their Results section, labeled something like Results and Discussion followed by a final Conclusion. Regardless of the format they use, they usually include the following components in the Discussion/Conclusion section of their paper:

**An overview of the study:** The purpose of the study is restated, the questions under investigation are summarized, and any propounded hypotheses are reiterated.

**Overview of the findings:** The researcher should show how the findings address the research question and/or support or fail to support any hypothesis being proposed.

**Relation of findings:** The researcher should relate the findings of his or her study to previous research findings and theoretical thinking.

**Attention to limitations:** The researcher should evaluate his or her own study and point out any weaknesses and/or limitations regarding the study.

**Possible applications:** The researcher should suggest in his or her conclusions how the results can be applied to practical situations.

**Future possibilities:** The researcher should suggest topics for future research.

### QUESTIONS EVERY CONSUMER SHOULD ASK

When evaluating the Discussion/Conclusion section of a study, there is a set of questions that the consumer should address:

1. Do the findings logically answer the research questions or support the research hypothesis? Here is where the consumer must be wary. Many, if not all, researchers have their biases and would love to find answers to their questions or support their hypothesis from the results of their studies. Because this final section gives the researchers the right to conjecture about what the findings mean, it is easy to unintentionally suggest things that the results do not support.

2. Does the nature of the study remain consistent from beginning to end? My students and I have noticed that some studies begin as exploratory studies, but end up as confirmatory ones. In such cases, the introduction section has one or more research question with no specific hypothesis stated. However, in the Discussion section, we suddenly read, “and so our hypothesis is confirmed by the results.” Another variation of this is that the researchers generate a hypothesis in the Discussion section—which is their right—but then go on to suggest that their results now support the hypothesis. This is circular reasoning. We cannot use the same data to support a hypothesis from which it has been formulated. A new study must be made to test this hypothesis.

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3. Are the findings generalized to the correct population or situations? Most studies, in fact, cannot be generalized to a broadly defined population. The reason is that most samples are not randomly selected, nor are they typically large enough to adequately represent a target population. Consequently, results of such studies are suggestive at most and need to be followed up with a number of replications. If the same findings are repeated using different samples from the target population, then we can have more assurance that we are on the right track. A well-written Discussion section will be careful to warn readers of this problem.

4. Are the conclusions consistent with the type of research design used? The main concern here is whether causation is being inferred from research designs that are not geared to demonstrate this effect. Having an idea of the type of design being used will help the consumer know whether this error is made when reading the Discussion and Conclusion. Non-experimental designs such as descriptive or correlational ones cannot be used to directly show causation. Yet, especially in the latter case, some researchers have slipped into concluding that their findings indicate that one variable influences another. When researchers apply their findings, they are often tempted to recommend that people manipulate one variable to cause changes in another. Unless their research design warrants this application, they have made a logical error.

5. Are the findings and conclusions related to theory or previous research? To help contribute to the big picture, a well-written Discussion/Conclusion section should attempt to tie the findings and interpretations to any current theoretical thinking or previous research. This might be done through showing how the findings support what has gone before or providing evidence to refute some theory or challenge previous research.

6. Are any limitations of the study made clear? There are very few, if any, perfect studies in the literature. Regardless of how good a study is, a conscientious researcher will mention what the limitations are to caution the reader from being overly confident about the results.

7. Is there consistency between the findings and the applications? Have seen relatively small correlations, such as  $r = 0.30$ , interpreted as an important finding because it was statistically significant, or the difference of 5 points between a treatment and a control group given importance for the same reason. Yet is either of these findings large enough to get excited about? Maybe, but much depends on the cost in time, human resources, and finance to get that 0.30 correlation or those extra 5 points due to the treatment. The consumer needs to be on alert when a researcher advocates costly changes based on statistical significance.

### CONSTRUCTING A RESEARCH LITERATURE REVIEW

#### WHY DO A REVIEW OF RESEARCH?

The main benefit of doing a literature review is to provide the consumer with a mosaic of what is happening concerning a given topic. No one research study exhausts all there is to know about a given topic. However, when you can integrate various recent research articles into a meaningful picture, you can discover a number of interesting things. First, you will realize whether there are any plausible answers to your questions when you see the bigger picture. On first blush, your impression might be that there are no clear answers, and you might be tempted to give up your search. However, as you weave the studies together in an integrated review, you might find answers for practical use. In addition, you might find conflicting results between studies. This might cause you to give up and conclude that no one can agree on any- thing. However, this is when being a discerning consumer will pay off. On careful scrutiny of the studies, you will begin to see why there are conflicting results. You might realize that the differences in the samples used in the studies produced the differing results. There might have been a difference in the procedures or materials used in the treatment. You now have to decide which study best corresponds to the context surrounding your particular research question. The closer the correspondence, the more applicable the findings might be to your situation.

However, if you find that the same results are replicated over a variety of studies, you can have more confidence that you are on the right track. Here is where external validity comes into play. Regardless of the sample, procedures, materials, or type of tests used, if the same findings keep appearing, you can be quite confident that you have a workable answer for your question. Without a well-done literature review, you cannot have this assurance. Occasionally, you will discover that there is little recent research on a particular question. When this happens, you should take this as a warning to take care. Maybe your research question is stated in such a way that your search accessed only a few studies. If this is the case, you will have to adjust the key concepts in your question to produce more rewarding searches. You might have to go back further in time to see whether there was anything done earlier. Then again, your question may be so novel that there is little research available to date.

To illustrate, one of my students raised a question concerning the usefulness of the critical period hypothesis. However, when looking over the past 5 years, he could not find enough research to fill a short 3-page review. He first asked whether this topic had been researched out—that is, had research gone as far as possible, whether by sufficiently answering the question or by being limited due to various constraints. Most probably, in my thinking, the latter might be the case. The variables used to test this hypothesis are beyond our current capabilities to manipulate or measure. If this is the case, we cannot make strong conclusions about children’s seemingly superior language learning abilities as compared with adults. Possibly new approaches will be developed that will move research ahead on this topic in the future.

Second, doing a research review is important if you plan to do a study yourself. Such a review will give you an overview of the different kinds of methodologies, instruments for collecting data, and ways in which to analyze data commonly used in the research for a given area. This knowledge can help you

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decide whether your proposed study is even feasible given your time, material, and financial constraints. Many a fledgling researcher could have saved him or herself needless angst if s/he would have realized that the study s/he was interested in doing required more time and resources than were available before launching into the task.

the first place to begin is searching for studies using preliminary sources. These are used to find documents that report research studies or theoretical positions. Most university libraries in the United States and Europe, as well as some public libraries, have such computerized search capabilities. Now that the Internet is available in most countries, you should be able to obtain a list of research studies pertinent to your questions even from your home computer. Again, as mentioned in chapter 2, your search is as good as the keywords (or descriptors) you use. You might have to try different combinations of these words to obtain sufficient results for your review, or you might have to use a thesaurus from the preliminary source you are using to identify related keywords to guide your search. Your goal is to access firsthand research studies (i.e., primary studies) that relate to your questions. How many studies you include depends on the nature of your question(s). If you want to do an exhaustive literature review, you will want to cover as many studies as you can find. However, most people want to put some limitations on their literature review, such as time constraints and/or only journal articles, to confine their search to studies with only certain characteristics.

Figure A.1 illustrates the results of a search I made for research articles using the ERIC database on the Internet. I put time limits and location limits for studies published between 1990 and 2002 in research journals only. I first began with the broad search only using the keyword ESL. The results were 1,200 documents. I then narrowed it down to articles dealing with ESL and writing, resulting in 336 references. If my question of interest was something like, “What does research say about writing in ESL?”, I might want to stop here and scan through all 336 references.

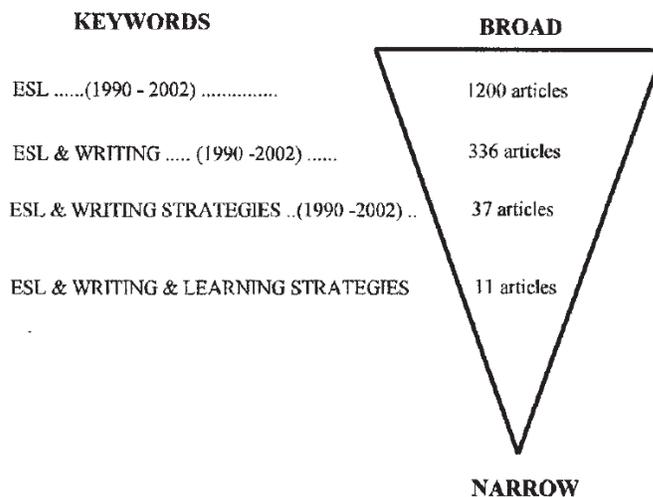


FIG. A.1. Results of using different combinations of keywords in a literature search using ERIC for years 1990 to 2002.

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Most likely, I would want to narrow my search even more. For instance, I am interested in finding research studies about strategies ESL people use when writing. So I restated my search terms to be ESL and writing strategies. As shown in Fig. A.1, this captured 37 articles. I could have stopped there, but I wanted to make sure that the way I worded my keywords did not prevent me from seeing some study that might be using different terminology. So I did one more search, adding learning strategies to my list of keywords. This reduced the search to 11 articles.

You might ask the question, “How far back in time do you go in your search?” My recommendation is that you begin by looking at the last 5 years of research. Usually this results in enough current research to provide viable information addressing your question(s). I then suggest that you begin with the most recent research and work backward in time. This way you stay abreast with the most recent issues and findings with which researchers are currently working. This can save time by not getting involved with outdated issues with which people in the discipline are no longer concerned.

Once you have identified the studies you want to consider for inclusion in your review, you face the challenge of getting your hands on the actual articles. Hopefully, you will be near a good library that carries the journals so that you can have ready access to the studies. If the library does not subscribe to the journal, it may have a library loan agreement with other libraries that do have the journals. Some journals such as *Language Learning* and *Modern Language Journal* have electronic versions to which your library might have access. In such cases, you can download full articles for reviewing. If all else fails, you can order journal articles through databases such as ERIC, and they will mail them to you either through your library or to your address. If you do this, I strongly suggest that you order the microfiche version to keep the cost down and help save trees. You will need a microfiche reader for this, but these should be available at your library.

### DOING A RESEARCH LITERATURE REVIEW

#### ABSTRACTING PRIMARY LITERATURE

In preparation for constructing your review of the research literature, you need to formulate a systematic procedure for cataloging and storing your information for each study. We used to have to put our information on i.e., 12 cm × 20 cm cards that were awkward to handle. However, in our computerized day, there are a number of information storage software systems that make this task much easier. The one I favor and have used over recent years is Microsoft® Access 2000 (1999), which is readily available and easy to learn, although there are a number of others that will do the same job. Once you enter the information, which I discuss shortly, you will have created a database of studies from which you can draw information for your literature review. This database will provide you with the ability to sort and aggregate various studies at the click of the mouse based on whatever criteria you decide to use.

When you set up your database of studies for your review, enter the following use. First, record very accurately the last names and all initials for every author of each study. If you have only one author, it is useful to identify his or her gender as well because you might want to use personal pronouns when summarizing his or her study rather than speaking in the formal the researcher. Next, you want to record the exact title of the article. When doing this, use the style (e.g., APA or MLA) that you plan to use for your literature review. This will save you time when you prepare the table of references because you will not have to retype the references. At most you will only have to cut and paste with your word processor software. Following this you will need to record the year published, the exact title of the journal (in italics), the volume number (in italics), the issue number, and the page numbers from the beginning of the article to the very last page.

If you have read a published literature review, you will have noticed that the author basically looks for eight things when summarizing the main body of the study. They are as follows:

1. The focus of the study: What area and/or issue is being studied?
2. The research question(s) being asked.
3. The hypothesis(es) being tested (if any).
4. The size of the sample and important characteristics such as age and gender. Note here how the sample was chosen or assigned to the study, whether randomly or by some other procedure.
5. The variables in the study such as:
  - a. Observational
  - b. Independent
  - c. Dependent
  - d. Moderating

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6. The procedures followed, including any materials, test instruments, or observational techniques.

The overall findings of the study.

8. The conclusion(s) that the researcher draws from the findings.

In addition you will want to add:

9. Any other observations you have made that pertain to your interests.

10. Any concerns you have with the study that you want to point out in your review.

### WRITING A RESEARCH LITERATURE REVIEW

#### WRITING A REVIEW OF RESEARCH

The outline I recommend for writing a good review of research is one that I have adapted based on chapter 6 of Cooper's (1998) book, *Synthesizing Research*. This pattern seems to be the one followed by many reviewers of research published in journals (e.g., Ellis, 2002; Sparks & Ganschow, 2001). Interestingly, this outline has the same headings that are used in reporting most primary research studies: Introduction, Method, Results, and Discussion.

#### I. Introduction

- A. The research question that your review addresses.
- B. The importance of the topic.
- C. Historical background of the topic (theory, methodological issues, previous reviews, etc.).
- D. The goal of your review. How you plan to add to the theory and information already available.

#### II. Method section: Details regarding the makeup of the review.

- A. What years are covered?
- B. What preliminary sources were used to locate the studies?
- C. What keywords guided your search?
- D. Criteria for deciding which studies to review.
  1. Description of the constraints that limited your selection.
  2. Rationale for choosing these constraints.
- E. What studies were excluded and why?

#### III. Results section: Studies summarized.

- A. An overview of what studies will be discussed and their relation to one another and the review as a whole.
- B. At least one paragraph for each study summarizing the following:
  1. The main point of the study.
  2. The question(s)/hypothesis being studied.
  3. Samples used and how they were chosen.

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4. Procedure(s) used
5. General findings(results).
6. Author's interpretations/applications of the findings.
7. Any concerns to which you might want to alert the reader.

### IV. Discussion section

- A. Give an overview of major results of your review.
- B. Compare/contrast the results between studies.
- C. Provide possible reasons for any differences.
- D. Relate results to any theoretical issues you mentioned in the introduction.
- E. Compare with past reviews if any exist.
- F. Explain any difference in findings with past reviews.
- G. Offer application of findings toward future research.

Whenever possible, I recommend that you construct tables to help summarize your findings. What you put in a table will depend on what you are trying to highlight in your review. The purpose of the table is to provide a visual aid that will work with your text in helping the reader understand all of the relationships that you are trying to point out.

### **Preparing your own review of research literature.**

The purpose of this exercise is for you to produce a review of research in an area of your own interest. You are to review whatever number of studies you find relevant in the space allowed. You are to develop an overall picture of what is being studied in your chosen area.

### **Criteria for the main body of the text:**

#### I. Introduction: Conceptual presentation

- A. What is your research question(s) that motivates your review?
- B. Why is the answer to your question(s) important to applied linguistics?
- C. What is the historical perspective behind your question?
- D. What is the main aim of your review?

#### II. Method section

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## A. Details of the nature of your search.

1. What years did you cover in your search?
2. What preliminary sources did you use?
3. What keywords guided your search?

## B. Criteria for deciding which studies to review.

1. What criteria did you use for including a study?
2. Why did you select these criteria?
3. What studies did you exclude and why?

## III. Results section

### A. An organized summary of the studies: Each study should include the following in your own words:

1. The main point of the study.
2. The question(s)/hypothesis being studied.
3. The sample used and how and why it was selected.
4. The procedure(s) used for implementing the study.
5. The general findings (results) in words, not statistics.
6. The researcher's interpretations/applications of the findings.

## IV. Discussion section

### A. Summarize the major results of your review (use tables to provide visual aids in your summary if possible).

1. Compare/contrast the results between studies.
2. Provide possible reasons for any differences.

### B. Compare with past reviews if any exist.

### C. Explain any difference in your findings compared with past reviews.

### D. Apply your findings toward answering your future research.