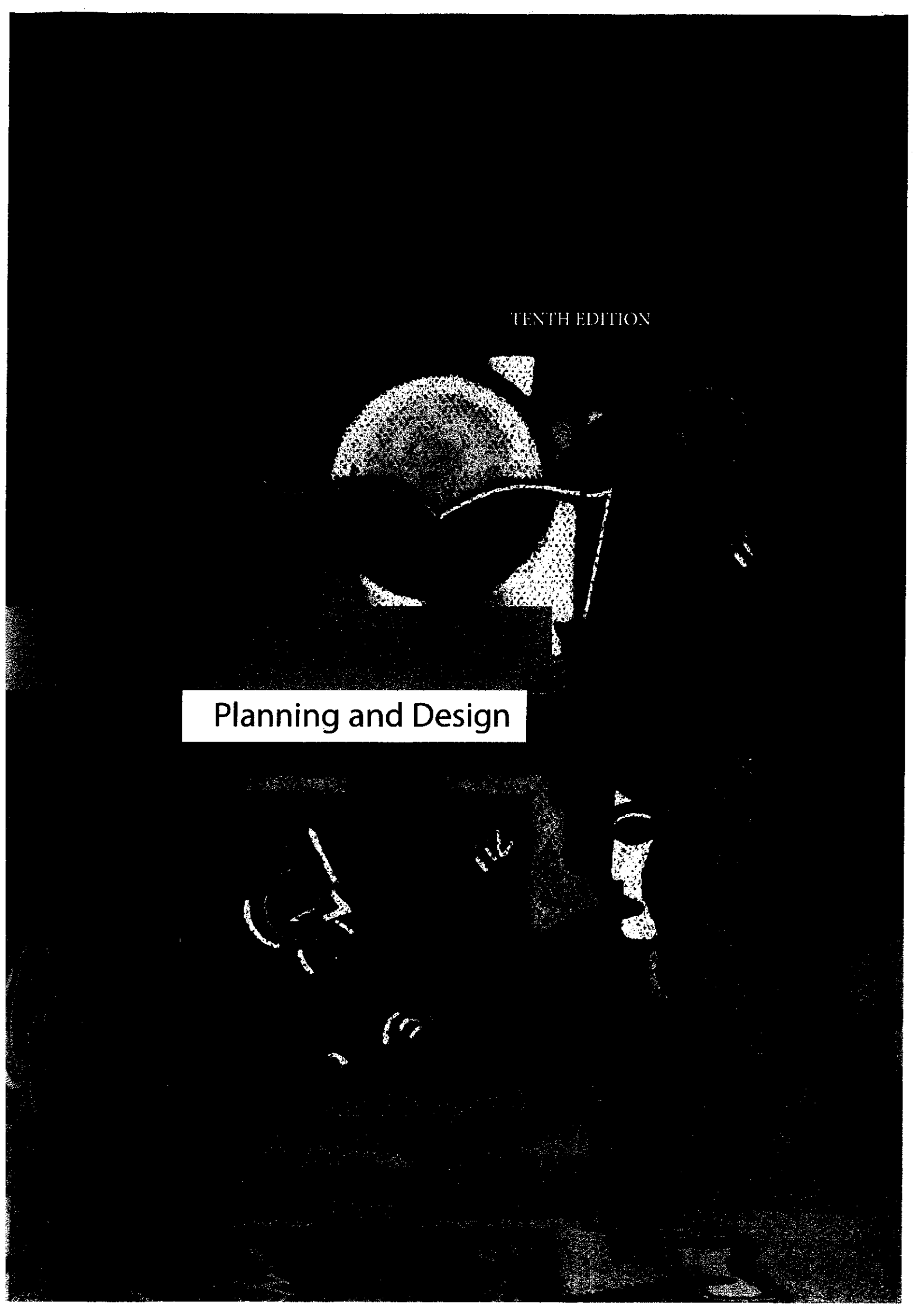
TENTH EDITION



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ALWAYS LEARNING

12 Writing the Final Research Report

Ultimately, what you put on paper and how you put it there reveals your knowledge, the quality of your thinking, and your standards of excellence more eloquently than anything else you do.

Bringing a research effort to its rightful conclusion involves writing a report that is faithful to the data but also finds meaning in those data. The research report is a straightforward document that sets forth clearly and precisely what the researcher has done to resolve the research problem. In structure, it is factual and logical. Like the research proposal, it makes no pretense at being a work of fine literature. It must, however, be comprehensible so that readers can easily grasp what the researcher has done and found. It must also be flawless in its sentence and paragraph structure, punctuation, and spelling. The research document you write is a clear reflection of your scholarship as a researcher, and for this reason it is often used as a culminating measure of a student's educational achievements.

Getting Started

If you are writing a thesis or dissertation, be sure to check first with your university's graduate school office to ascertain whether it has a prescribed set of guidelines for writing theses. Check such matters as paper quality, width of margins, size and style of font, and heading format. What is permitted at one institution may be unacceptable at another. Ask whether your university has a style manual for writing research documents or whether it recommends that you adhere to a particular published style manual.

University guidelines aside, different disciplines tend to adhere to different styles in research reports; for example, psychologists typically use *American Psychological Association (APA)* style, whereas historians tend to use *Chicago* style. Differences among the styles are most noticeable in the formats used for citations and reference lists. For example, the dissertation near the end of Chapter 11 includes citations within parentheses, consistent with *APA* style. In contrast, the dissertation near the end of Chapter 7 uses footnotes, consistent with *Chicago* style. Table 12.1 lists four commonly used styles, along with sources of information about each one.

Surfing the Internet for Writing Assistance

Numerous sites on the Internet offer assistance on the nitty-gritty details of different styles. In the rightmost column of Table 12.1 are websites that are active as this book goes to press (helpful websites for CSE style are limited and spotty at best). Another strategy is to use a search engine such as Google or Yahoo! and type such keywords as "style manuals," "MLA style," and the like in the search box; doing so will lead you to many potentially useful sites at universities and elsewhere.

Some sites on the Internet offer more general suggestions for writers. A good example is the Online Writing Lab (OWL) at Purdue University (owl.english.purdue.edu). If you go to OWL's

TABLE 12.1
Commonly used styles in research reports

		Online Assistance
APA Style: American Psychological Association	*American Psychological Association (APA)* (2010). *Publication manual of the American Psychological Association* (6th ed.). Washington, DC: Author.	www.apastyle.org/ www.psychwww.com/resource/apacrib.htm
Chicago Style: University of Chicago	*Chicago manual of style* (16th ed.) (2010). Chicago: University of Chicago Press.	www.chicagomanualofstyle.org
CSE Style: Council of Science Editors	Council of Science Editors (2006). *Scientific style and format: The CSE manual for authors, editors, and publishers* (7th ed.). Reston, VA: Author.	
MLA Style: Modern Language Association	Modern Language Association (2008). *MLA style manual and guide to scholarly publishing* (3rd ed.). New York: Author.	www.mla.org/style

website and click on "Site Map," you can find links to discussions of a wide range of topics related to writing—how to write persuasively, how to enhance sentence clarity, when to use various pronouns and verb tenses, in what circumstances to use hyphens, and so on. OWL also provides guidance on *APA*, *Chicago*, and MLA styles.

Learn by Looking

Perhaps the best way to understand and appreciate the nature of research reports—and to prepare yourself for writing one—is to look at existing reports. Any university library should have a collection of graduates' theses and dissertations on its shelves. You can find theses and dissertations from other universities in the ProQuest Dissertations & Theses database, an online resource to which many university libraries subscribe. Many federal agencies and professional associations disseminate research reports on numerous topics and often post these reports online.

Keep in mind that not all published research reports provide good models for novice researchers. Some, in fact, are poorly written. If you have trouble reading and understanding a report concerning a topic about which you have considerable knowledge, you might very well conclude that the author of the report is *not* a writer whose style you want to emulate!

Planning a Research Report

A research report has a relatively simple format. In general, it should achieve four objectives:

1. It should give readers a clear understanding of the research problem and why it merited an in-depth investigation.
2. It should describe exactly how data were collected in an attempt to resolve the problem.
3. It should present the obtained data precisely and completely. The data presented in the report should substantiate all the interpretations and conclusions that the report contains.
4. It should interpret the data for the reader and demonstrate exactly how the data resolve the research problem. A report that merely presents raw data and uninterpreted facts (in the form of tables, graphs, and other data-summary devices) is of little help to the reader in deriving meaning from those data.

In the following sections, we discuss each of these matters. We then address how best to conclude the report and, in a subsequent section, remind you once again about the importance of being completely truthful and forthcoming about what you have accomplished.

Description of the Research Problem

The statement of the problem and any other information needed to understand it should comprise the first section or chapter of the final report. Readers should be able to comprehend *from the report alone* what the problem is and what its ramifications are. Also, readers should appreciate the setting in which the problem was conceived. In addition, readers should learn why, from both academic and practical standpoints, the study was an important one to conduct.

The first section of the research report has but one purpose: to create a meeting of minds between the writer and readers of the report. Many research reports begin badly because their writers have not set forth the problem clearly and completely for readers. Such omissions get readers off to a confused start, which can impose a cloudy haze over the rest of the report. The writer of a research report must keep in mind that readers are likely to know only those things that the writer has actually put on paper.

After a few introductory comments (perhaps a few sentences or paragraphs) that provide the background and a rationale for the study, the document should set forth clearly and unmistakably the problem that has been researched. Often, an appropriate subheading can draw readers' attention to the research problem. If the problem has been divided into subproblems, these should be presented following the statement of the problem and announced with proper subheadings. And, of course, any preliminary hypotheses should be clearly stated in this opening section. By presenting the problem, its subproblems, and any hypotheses, the writer gives readers a clear and complete understanding of the *principal thrust* of the research effort. With this objective in mind, readers will be in a better position to understand the interpretation of the data and to judge the merits of the research.

This section should also define any terms that may have multiple meanings or in some other way might be ambiguous. For a meeting of minds, it is imperative that the researcher and readers share a common understanding of key concepts around which the research effort has revolved.

Any delimitations should be clearly set forth as well. All who read the research report should know precisely how far the research effort extended and where limits were set. Into what relevant areas did the research effort not inquire? What aspects of the problem have not been studied? Readers want answers to these questions, and they expect to find those answers in the opening pages of the report.

Also, be sure to include the assumptions you have made in designing your study and collecting and interpreting your data. For guidance on pinning down definitions of terms, delimitations, and assumptions, we refer you to Chapter 2.

The extent to which related literature is presented in the first section of the report depends on the nature of the report. In a journal article, the literature immediately relevant to the problem is summarized in the introductory paragraphs before the statement of the research problem. In a thesis or dissertation, only a few key works are identified in the first chapter, and the bulk of the related literature is reserved for a separate chapter.

Description of the Method

The method that was used to collect data—including the sample, assessment instruments, and procedures—should be described with the utmost precision. From this description, readers should know exactly what was done, to the point where the readers could replicate the study and, presumably, get similar results.

More generally, the *design* of the study should be clear. In particular, the researcher should state whether qualitative or quantitative methods (or both) were used and what particular research traditions were followed—for example, whether the study was an ethnography, a grounded theory study, a longitudinal study, a survey, a single-group time-series study, a 2-by-2 factorial design, or some combination of approaches.

Qualitative researchers also engage in **reflexivity**: Because their data collection has inevitably been influenced by their own assumptions and values, they openly acknowledge their biases and speculate on how these may have affected what they did, what data they collected, and how they interpreted their results.

Presentation of the Data

After readers fully understand just what the problem was and the manner in which it was investigated, the next question is, What is the evidence? For the most part, the data are presented *as they relate to the problem and its subproblems.* You have gathered a mass of data. You have then codified, arranged, and organized the data sets into subsets, each of which corresponds to a particular part of the problem being studied. You describe these various subsets in a logical sequence. Before beginning a discussion of each subproblem and its attendant data, it is helpful to restate the subproblem, perhaps in the same words that were used in the first section of the report. Doing so will help to keep readers' attention focused on the specific aspect of the research problem under discussion.

One logical approach is to devote a separate section (each with its own heading or subheading) to each subproblem and its pertinent quantitative and/or qualitative data. Present the subproblem, present the data germane to it, analyze and interpret those data, and draw conclusions that the data warrant. Each section might end with a brief summary in which the findings of that particular section are shown in relationship to the general problem and any relevant subproblems.

Yet you need not limit your discussion of results only to the problem and subproblems you have identified at the beginning of your report. For instance, if you have designed a rating-scale instrument to assess people's attitudes or beliefs regarding a particular issue, you should, if applicable, report the internal consistency reliability of the instrument (see the discussion of internal consistency reliability in Chapter 4, as well as the footnote on page 199 in Chapter 8). And in a later subsection in your results section, you might describe additional findings of interest—for instance, unexpected gender differences in participants' performance or intriguing questionnaire responses that raised issues you had not initially considered.

So that readers don't get lost in the data presentation, it is often helpful to begin the discussion of results with an *advance organizer* in which you lay out the overall organization of how the results will be presented. We refer you to the guidelines "Writing to Communicate" in Chapter 1 for a description of advance organizers.

The data should be presented thoroughly and, of course, accurately. In many cases, it is helpful to organize some of the data in tables, figures, and other concise presentations. A **table** is usually an arrangement of words, numbers, or combinations of these elements in a two-dimensional matrix for the purpose of exhibiting certain information in compact and comprehensive form. A **figure** is any kind of graphic illustration other than a table: a graph, chart, map, flowchart, photograph, drawing, or other device to convey an idea—sometimes a picture really is worth a thousand words! Many computer software programs can create tables and figures for you; for example, see Microsoft Word and Microsoft Excel (for tables and graphs), Inspiration (for flowcharts), and Maptitude or Mapland (for maps). All tables and figures should be specifically labeled (e.g., "Table 1," "Figure 3") and have captions that describe their contents, and you should refer to all of them in the text of your report. If you are writing a thesis or dissertation, most universities ask that you present tables and figures as soon after the in-text reference as possible; however, check with your own university's graduate school office for its own requirements about such things.[1]

When the data have been subjected to statistical analysis, present your rationale for employing the particular statistical approach(es) you have used. It is important to know not only that you used a particular technique but also *why* you used it. In fact, throughout the entire research process, you should keep in mind that, generally, the answer to the question "Why?" is just as important as the answer to the question "What?" One of the weakest links in many research reports is the failure to substantiate what one has done with a solid rationale as to why one has done it.

When statistical analyses have *not* been conducted (as is often true in qualitative studies) the data must be presented in such a way that they speak for themselves. As previously mentioned

[1]When writing manuscripts for publication, tables and figures often appear at the end of the document, and a notation within the running text indicates where they should be inserted in the published version of the report. For more specific guidance, consult the "Instructions to Authors" guidelines for the journal or other publication in question; such instructions are often found in each issue of the publication or on the publisher's website.

in Chapters 4 and 6, qualitative researchers often engage in *thick description,* presenting the data in such detail that readers can see for themselves what is going on. One well-known ethnographer takes this approach:

> In striking the delicate balance between providing too much detail and too little, I would rather err on the side of too much; conversely, between overanalyzing and underanalyzing data, I would rather say too little. (Wolcott, 1994, p. 350)

Descriptions of data in quantitative studies are typically written in an objective, "scientific" style. Those in qualitative studies vary from the objective and aloof, on the one hand, to the more subjective and personal, on the other. Qualitative researchers frequently include dialogues and participants' statements to illustrate their findings. They may also use metaphors and analogies to make a point. We see a simple yet effective "anti-metaphor"—an example of what something was *not*—in Matthew McKenzie's (2003) dissertation about the Boston Marine Society (previously excerpted at length in Chapter 7):

> *No mere gentleman's club,* common work experiences defined the society as a community, set aside from the rest of the town. (McKenzie, 2003, p. 20; emphasis added)

Regardless of how you organize your presentation of the data, it is imperative that you present them as evidence for the conclusions you draw. If the data are extensive and you choose to present them only in summary form in the main body of the report, you might present them in their entirety in an appendix; this strategy is especially common in qualitative research reports. In this way, anyone wishing to replicate the results of the research effort should be able to reach essentially the same conclusions.

Do not forget that you may also be testing one or more hypotheses. Somewhere—probably in the closing paragraphs of each section or chapter—you should indicate whether the data did or did not support the hypotheses being tested. Restate the hypotheses and say explicitly whether they were supported or not supported by the data.

Interpretation of the Data

All too frequently, researchers believe that, having once presented the facts and figures, they have done all that needs to be done. To display the data is certainly important, but as we have said so many times before, the *interpretation of the data* is the essence of research. Without inquiring into the intrinsic meaning of the data, no resolution of the research problem or its subproblems is possible.

One common error that many researchers make is to fail to exploit the data fully. One cannot turn over the facts too often, look at them from too many angles, or chart, graph, and arrange them in too many ways. Ask simple questions of those data. This is not to suggest that you should analyze the data to the point of virtually guaranteeing yourself a Type I error. But sometimes simple questions and naive approaches will afford you startling insights. Have you thought of plotting the data? What has caused the plotted data to peak? To reach a plateau? To dip or plummet? Do dynamics within the data have relevance to events that lie beyond them? Questions like these may sometimes crack the shell of the data and reveal the meaning within.

On the other hand, a researcher must not go *too* far beyond the data. Beginning researchers often lose sight of what they have actually found; so enthusiastic are they about their topic that they make extravagant claims and unwarranted inferences. As an example, one of us authors once sat on a doctoral dissertation committee for a student who had been studying the use of regional dialects in children's literature. Although the student drew many appropriate conclusions from her data, one of her conclusions was that literature that incorporates a regional dialect can help school children develop "an understanding and acceptance of sociocultural groups other than their own." The student had collected no data whatsoever about children who were reading such literature, let alone data specifically related to their understanding and acceptance of diverse sociocultural groups. The student's "conclusion" was, in reality, merely her strongly held conviction about the value of literature written in various dialects, and she should have presented it as such.

Be especially careful that you don't draw conclusions about causation or influence when the design of your study doesn't warrant such conclusions. A point we previously made in Chapters 8 and 11 bears repeating: *Correlation does not, in and of itself, indicate causation.* Certainly you can speculate that there *might* be a cause-and-effect relationship between two correlated variables, but you should never state or imply that there *definitely* is one. Make the speculative nature of your conclusion crystal clear, and back up your speculation with contemporary theory, other researchers' findings, or qualitative data in your own study. And stay away from words and phrases that imply a causal relationship—words and phrases such as *influence, affect, bring about, help students develop,* and *lead people to believe.* All of these inappropriately communicate that *one thing leads to another* in a causal manner.

And by all means, avoid the word *prove.* Research data rarely prove that a particular hypothesis is true. Remember, inferential statistics are based on probabilities: If a particular finding is statistically significant, it probably *wasn't* a fluke, a result that one might get strictly by chance two or three times in a thousand. Even so, it *might* be a fluke due strictly to the researcher's (unlucky) luck of the draw. A good researcher always makes this point clear to readers, for instance by saying something such as "The results support the hypothesis that . . ." or "The significant difference in means for the two groups is consistent with the premise that . . . ."

Research is indeed an exciting quest, but researchers must never let their enthusiasm interfere with their objectivity in interpreting and drawing conclusions from the data. The answer to the research question should rest solidly and completely on its own empirical foundation.

Look the data steadfastly in the face. Report honestly what those data reveal to you. Ferret out every conclusion you have drawn, underscore it in red, and then be sure that the data in the tables, graphs, and other exhibits solidly support what those words underlined in red declare. That is good research.

What if the data *don't* support your predictions? Does this mean your hypotheses were wrong? Not necessarily. Look once again at your methodology and statistical analyses to see if you can identify one or more weaknesses in what you have done. Perhaps one of your measurement instruments had lower validity or reliability than you had anticipated and therefore was not yielding accurate and dependable measures of a critical variable in your study. Perhaps you gave participants misleading instructions or asked them misleading questions. Perhaps your statistical analyses lacked power—maybe your sample was too small or your measures too unreliable—and so you made a Type II error. You should report any weaknesses and flaws in your study that may have influenced its outcome.

At the same time, maybe your hypotheses *were* wrong. In the interest of advancing the frontiers of knowledge, you must be sufficiently objective to admit when your thinking was flawed and offer reasonable explanations—perhaps in the form of alternative hypotheses that future research efforts might test—for the results you obtained.

In the final analysis, *the data must speak for themselves.* The researcher is only the mouthpiece. You may not like what the data say. They may not confirm your fondest hopes or support your preconceived opinions, but the researcher is the servant of the scientific method. That method looks at evidence squarely and without prejudice; it reports candidly and precisely what the impersonal data affirm.

Defending one's research effort is an academic tradition. *Defend* in this sense means "to justify one's conclusions, to support one's statements with the backing of solid data that have been presented in the document." Nothing short of this will suffice.

Concluding the Report

Any research report should end by bringing closure to the interpretation of the data. In a thesis or dissertation, this discussion is often in a separate section or chapter, perhaps one titled "Summary, Conclusions, and Recommendations."

In this section, all loose threads should be gathered together. This is the place for looking backward, for distilling into a few paragraphs precisely what has been accomplished in each phase of the research activity. One should be able to see the research endeavor as through the

wrong end of a telescope or set of binoculars: clearly, in miniature, with all significant aspects brought together in proper perspective. Here the researcher should clearly summarize the findings and conclusions pertaining to the problem and the subproblems. The conclusions should be entirely supported by the data presented. Then, the researcher is ready for several final steps: (a) stating whether or not the hypotheses have been supported (quite possibly repeating what was previously said in the data presentation section; (b) identifying weaknesses and limitations in the study as it was designed or carried out; (c) identifying possible practical implications of the results; and (d) making recommendations for further research as a follow-up to the present study.

A few words should be said about summaries. The whole research project—the problem, the data and their organization, the relationships and interrelationships—is so clear in the mind of the researcher that he or she may forget that readers are not so intimately acquainted with the project. Through lengthy and intensive involvement in a study, the researcher has an acute awareness of the master plan, the relation of each component to the total study, the parts as they fit into the whole. Readers, however, are not so fortunate. As they proceed through the report, they need to stop occasionally to consider and reconsider how the text fits into the total investigation.

To facilitate readers' "journey" through a research report, a good researcher provides regular guideposts in the form of headings, transitional words and paragraphs, and other means of helping readers follow the train of thought. But in addition, the researcher provides a summary at the close of each extended discussion. By pausing long enough to summarize what has been said and what relevance such discussion has to the overall research effort, the researcher maintains the unity of the whole. Discussions that ramble on and on tend to produce psychological numbness, bewilderment, and confusion. Frequent summaries prevent such reader disorientation.

Maintaining Your Academic Integrity

By **academic integrity**, we mean conducting and writing about research with utmost honesty and a desire to learn and convey the truth—and *nothing but* the truth—about a topic of investigation. In writing a research report, academic integrity includes all of the following:

- Appropriately crediting the words and ideas of other people (see the discussion of plagiarism in Chapter 3)
- Maintaining confidentiality and protecting participants' right to privacy (in some cases, this may require using pseudonyms or altering demographic information for certain participants, in which case you should specifically state that you have made these changes)
- Explicitly identifying any biases in your sample selection—for instance, by reporting low return rates in mailed surveys or high attrition (drop-out) rates in longitudinal studies
- Describing any participants you dropped from your research sample and explaining why you dropped them
- Describing the limitations of your measurement instruments—for instance, by reporting any evidence of poor validity or reliability
- Describing any procedures you may have used to fill in missing data points in order to increase the number of participants for which you could conduct various statistical analyses
- Providing a comprehensive report of your research findings, including those findings that do *not* support your hypotheses
- Explicitly identifying any potential confounding variables that may cast doubt on conclusions about cause-and-effect relationships

We must emphasize a point we previously made in Chapter 4: *Researchers must report their findings in a complete and honest fashion, without misrepresenting what they have done or intentionally misleading others about the nature of their findings.* Only by being honest with one another can researchers truly advance the frontiers of knowledge. To misrepresent or mislead others in any way—no matter how well-intentioned those actions might be—is to potentially lead a community of scholars astray in their quest for knowledge.

Front Matter and End Matter

In addition to the essential sections described earlier, many lengthy research reports, including theses and dissertations, also contain **front matter** (content that precedes the introductory first chapter) and **end matter** (content that follows the final chapter). We take a few pages to describe this material.

Preliminary Pages

The preliminary pages include all the introductory material that precedes the discussion of the research problem and study. The title page comes first; this also includes the author and, typically, a university affiliation and date. In a thesis or dissertation, the title page is followed by a page for signatures of the faculty advisor and research committee. Next are an abstract, a page for the dedication (if any), an acknowledgment of indebtedness to individuals who have assisted in or in some other way supported the research, a table of contents, lists of any tables and figures, and, if desired, a preface.

In some instances, copyright information is included on the title page or the page immediately after it. **Copyright** is the protection given by law to the authors of literary, dramatic, musical, artistic, and other intellectual works. In the United States, this is U.S. Code, Title 17. Under current U.S. law, which applies to works created on or after January 1, 1978, copyright protection lasts for 70 years following the author's death. A thesis or dissertation is protected by copyright law even if you do not register it with the United States Copyright Office. Nevertheless, registering it often provides reassurance and piece of mind. As this book goes to press in 2011, the fee for filing a research report with the copyright office is $35 or $65 for online and paper applications, respectively. You can get more information about U.S. copyright laws and procedures at the Copyright Office's website (www.copyright.gov).

The **abstract** provides a summary of the entire research effort in a paragraph or two. For a journal article, the length of the abstract is usually 100 to 250 words, depending on the journal. For a dissertation, the abstract should be 350 words or less. The abstract should include sufficient information about the research problem, methodology, results, and interpretations to give potential readers an idea as to whether the study addresses a topic of concern to them and therefore merits their further attention. The abstract you write is likely to be included in one or more abstract collections in either paper collections (e.g., *Dissertation Abstracts International* and/or published collections of abstracts specific to your academic discipline) or online databases (e.g., ProQuest Dissertations & Theses) that then become available at many research libraries around the world. It is essential, therefore, that you take seriously the task of writing the abstract and describe your project as clearly, precisely, and succinctly as possible.

To get a sense of what abstracts entail, we urge you to look at numerous examples in professional journals and doctoral dissertations. As you peruse each example, ask yourself questions such as these:

- What was this research project intended to accomplish—in other words, what research problem did it set out to address?
- What was the general design and methodology of the study?
- What were the results, and what conclusions can reasonably be drawn from them?

Find several abstracts that enable you to answer all of these questions easily, and use those abstracts as models as you write your own abstract.

We cannot overemphasize the importance of writing a good abstract. It should summarize your project and findings clearly and succinctly—enough so that readers gain a concrete, stand-alone, take-away understanding of what you have done. But it should also pique readers' interest sufficiently that they follow up by reading your full research report. The more that people read your report, the more that your research project and report will have an impact on your field and, as a result, will enhance the world's knowledge of your research topic.

The **acknowledgments** page graciously recognizes the assistance of those people through whose kindness the research effort has been possible. These people may include those who introduced the researcher to data sources that aided in completing the research or those who guided the study and gave counsel or support—perhaps an academic dissertation committee, a faithful typist and proofreader, and family members who encouraged and assisted in the research effort. One hallmark of a true scholar is to say "Thank you" to those who have given their time and assistance to support one's efforts and aspirations. The acknowledgments page is the proper place for the expression of such indebtedness.

The remainder of the front matter indicates the content and organization of the text. The most important of this material is the **table of contents**. The table of contents is a bird's-eye view of what the document contains, how it is organized, and where each part can be found. Following the main table of contents are often two more specific ones, one for the tables and another for the figures that appear throughout the report.

Endnotes and Footnotes

Generally, **endnotes** (appearing at the end of the text) and **footnotes** (appearing at the bottom of relevant pages within the text itself) are used for three purposes. First, depending on the style manual being followed, such notes may be used to indicate sources of information and ideas (e.g., see the footnotes in the sample dissertation at the end of Chapter 7). Second, endnotes and footnotes are occasionally used to acknowledge permission to quote or reproduce something from a copyrighted document. When you quote extensively or use a table or other graphic representation from a copyrighted work in a report you intend to publish or distribute widely, you must secure permission to reprint the material (in writing) from the owner of the copyright (the publisher or author). After you use the material, an endnote or footnote (rather than a citation) may be used to indicate the exact source from which the material was taken, followed by the words "Reprinted by permission" or other wording stipulated by the copyright holder.

A third important function of endnotes or footnotes is to supplement information in the text of the report with additional information that strengthens the discussion. This type of note should be used sparingly and should not be used to explain complicated concepts. Keep such notes short and to the point. If you find your endnotes or footnotes becoming overly long and involved, sharpen your ideas and integrate them into the body of the report.

Reference List

A reference list at the end of your report allows readers to locate and use the sources you have cited. For this reason, it is imperative that reference information be complete—it should include references for *all* of your citations—and accurate. The reference list is not a bibliography, however; that is, it should *not* include references that you have *not* specifically cited in your report. Tempting as it might be to list all of the many books, journal articles, and other resources you have examined in an effort to better understand your topic, resources that you don't specifically cite in your literature review or elsewhere have no place in your reference list.

Each entry in the reference list should contain information about the author, year of publication, title of the work, and publication information. To some extent, researchers in different academic disciplines format their reference lists differently, and you should follow the format that your institution or your discipline requires. Furthermore, you should apply that format consistently throughout your reference list.

In Chapter 3 we suggest the use of a database to keep track of sources you use in your literature review. Software programs specifically designed for this purpose—known as *bibliographic software*—can also assist you in completing your reference list. Commercially available programs include Biblioscape (www.biblioscape.com), EndNote (www.endnote.com), OneNote (office.microsoft.com/en-us/onenote), and ProCite (www.procite.com). Other programs, such as

FIGURE 12.1
Sample reference list (APA style)

From *Effects of Training in Self-Generation on the Quality of Students' Questions, Class Notes and Examination Scores* (p. 130) by D. L. Jackson, 1996, unpublished doctoral dissertation, University of Northern Colorado, Greeley. Adapted with permission.

NOTE: At the time Jackson wrote her dissertation, APA prescribed underlining the titles of books, periodicals, and paper presentations, as well as underlining periodical volume numbers. We have changed her underlines to italics in order to adhere to contemporary APA style.

Jonassen, D. H., Beissner, K., & Yacci, M. (1993). *Structural knowledge: Techniques for representing, conveying, and acquiring structural knowledge*. Hillsdale, NJ: Erlbaum.

Kardash, C. M., & Amlund, J. T. (1991). Self-reported learning strategies and learning from expository text. *Contemporary Educational Psychology, 16*, 117–138.

Keppel, G. (1982). *Design and analysis: A researcher's handbook* (2nd ed.). Upper Saddle River, NJ: Prentice Hall.

Kiewra, K. A. (1985a). Learning from a lecture: An investigation of notetaking, review, and attendance at a lecture. *Human Learning, 4*, 73–77.

Kiewra, K. A. (1985b). Students' notetaking behaviors and the efficacy of providing the instructor's notes for review. *Contemporary Educational Psychology, 10*, 378–386.

Kiewra, K. A., Dennison, R. S., & Benton, S. L. (1995, April). *How studying text supplements affects prose production*. Paper presented at the annual meeting of the American Educational Research Association, San Francisco.

Kiewra, K. A., & Fletcher, H. J. (1984). The relationship between notetaking variables and achievement measures. *Human Learning, 3*, 273–280.

BiblioExpress (www.biblioscape.com/biblioexpress.htm) and Bibliography Writer (available on many Internet websites; search for "Bibliography Writer software") are freeware that can be downloaded without charge from the Internet. Virtually all of these software packages allow you to choose the particular style manual to apply in creating your reference list.

One widely used style in reference lists is that of the American Psychological Association (APA). APA style is described in detail in the association's *Publication Manual* (2010). We illustrate this format in Figure 12.1, which presents an excerpt from the reference list of Jackson's (1996) dissertation. Let's briefly look at how entries in an APA-style reference list are formatted with respect to author, date, title, and publication information. We'll then consider additional information required for sources obtained on the Internet.

Author. In an APA-style reference list, the author's name appears with the surname first, followed by the author's first and, if applicable, middle initials. When multiple authors are involved, the names are separated by commas. For example, the first and last references in Figure 12.1 have three and two authors, respectively. Commas are always used between the names (even between only two names), and an ampersand (&) is used before the last name in the list.

Date of publication. Following the author's name is the year of publication in parentheses, followed by a period. Magazines, newsletters, newspapers, and presentations also include the month (and, when necessary to pin down the particular source, the day).

In Figure 12.1, notice that two articles written by Kiewra as sole author were published in 1985. These have been listed alphabetically by article title, and the two articles are distinguished by designating the years as "1985a" and "1985b." Any citations in the text would then be either "Kiewra, 1985a" or "Kiewra, 1985b."

Title of the work. In APA style, the title of the article, book, or other source follows the publication year. If you are referencing an article using APA style, the title of the article is *not* italicized, but the title of the journal in which it appears *is* (see, for example, the reference for Kardash and Amlund in Figure 12.1). The title of a book is always italicized. So, too, is the title of a paper presentation (see the reference for Kiewra, Dennison, and Benton in Figure 12.1) or doctoral dissertation.

Be sure to pay attention to the rules for capitalization in whatever style manual you are using. Can you determine what APA's rules are from the entries in the sample? Did you notice that the first word in a book, article, or presentation title is the only one capitalized (unless the word is a proper noun or proper adjective or it follows a colon) but that all major words of a journal title are capitalized?

Publication information. For journal articles, publication information usually includes the volume number (which is italicized), issue, and page numbers. (If separate issues within each volume begin with sequentially numbered pages—for example, if the first issue of a particular volume ends on page 96 and the second issue begins on page 97—then the issue number can be omitted.) Publication information for a book includes the location and name of the publishing company or agency. In the case of a paper presented at a conference, the name of the conference and its location are provided.

Notice how this information is formatted in the sample entries in Figure 12.1. All redundancy is eliminated; there are no extra words such as *volume*, *issue*, and *pages*. By their specific location in a citation, readers understand their meaning. This practice eliminates many extra words; such a reduction means fewer manuscript pages, which translates into lower printing costs.

Notice, too, that references to a publisher are short and succinct, excluding such words as "Publishing Company" and "Publishers, Inc." These words add no new information and thus can be eliminated.

USING TECHNOLOGY

Referencing sources obtained on the Internet. Sources found on the Internet require additional information. Typically this includes either (a) the Internet address at which the document was found or (b) the Digital Object Identifier (DOI). You are almost certainly familiar with Internet addresses—in computer lingo, an Internet address is called a **Uniform Resource Locator**, or **URL**—and we have been using such addresses throughout the book to direct you to various Internet websites. For example, in APA style, an article in an online journal would be referenced using the following format:

> Amrein, A. L., & Berliner, D. C. (2002, March 28). High-stakes testing, uncertainty, and student learning. *Education Policy Analysis Archives, 10* (18). Retrieved from http://epaa.asu.edu/epaa/v10n18

Information found on a public or private organization's website—in this case, one that has no specific date attached—would be referenced using this format:

> Statistics Canada (n.d.). *Census of Agriculture counts 3,795 farms in Nova Scotia.* Retrieved from http://www.statcan.ca/english/agcensus2006/media_release/ns.htm

The "n.d." in parentheses in the preceding reference means that the document cited has *no date*, year or otherwise, associated with its posting on the Internet.

Whereas a document's Internet address can change over time, its **Digital Object Identifier (DOI)** is more permanent. DOIs are a fairly recent development for Internet-based documents, and thus they may require some explanation. In particular, DOIs provide a system through which people can register online postings and, later, other people can find them. Even if the particular URL for an online research report changes—for instance, this might happen if a university or other research institution reorganizes its website—the DOI remains constant for the foreseeable future. DOIs are especially helpful when research reports and other scholarly works are available only in electronic form. For instance, they are used to identify journal articles that appear online before they appear in paper. Following is an example:

> Wiers, R. W., Eberl, C., Rinck, M., Becker, E. S., & Lindenmeyer, J. (2011). Retraining automatic action tendencies changes alcoholic patients' approach bias for alcohol and improves treatment outcome. *Psychological Science.* Advance online publication. doi:10.1177/0956797611400615.

People who see this entry in the researcher's reference list can track down the publication by going to the International DOI Foundation's website (www.doi.org) and then entering the article's DOI—in this case, 10.1177/0956797611400615—in the "Submit" box.

Potential resources in a literature review take a wide variety of forms—books, articles, government reports, presentations, posters, videos, website pages, blog postings, and so on—and the various style manuals have prescribed formats for each one of them. Thus, we strongly urge you to obtain an up-to-date version of the manual appropriate for your discipline and follow its prescriptions to the letter.

Appendix Content

Following the main report may be supplementary **appendices** (sometimes instead pluralized as *appendixes*) that may be helpful in understanding the research study more completely but are not absolutely essential to the comprehension of the body of the report. A rule of thumb is that *the material appearing in the appendix enables the reader to go further in understanding the method and/or results if so desired.* For instance, an appendix may include informed consent letters, questionnaires and other measurement instruments, response sheets, field notes, statistical computations, or extensive data tables.

In reporting research, nothing is hidden. All of the data are laid before the reader. The researcher's integrity is thereby preserved, and the results and conclusions of the study can be readily verified.

Organizing the Research Report

Research reports for most quantitative studies are similar in their organizational format. After their preliminary pages (title page, acknowledgments, table of contents, etc.), they typically have five major sections: an introduction (which includes the statement of the problem, assumptions, definitions of terms, etc.), a review of the related literature, a description of the methodology, a discussion of results, and conclusions (including implications and suggestions for future research). They will, of course, also have a list of references and, sometimes, one or more appendices.

Reports of qualitative studies are less predictable, and their specific organization may be highly dependent on the nature and design of the studies themselves.

As illustrations, we present the outlines for two of the dissertations from which we have presented excerpts in previous chapters. The first is a traditional outline, used for a quantitative, quasi-experimental study; the second is less traditional, used for a qualitative, grounded theory study. In the interest of space, we omit any subheadings that appear under the major headings.

Effects of Training in Self-Generation on the Quality of Students' Questions, Class Notes and Examination Scores (Jackson, 1996)

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Body of the Report
Chapter I. REVIEW OF THE LITERATURE
Introduction [here the author presents the research problem]

Preparing the Report

The research report is precisely that—a *report.* The researcher is reporting on what he or she has done over the course of the research effort. In the process, the researcher is acquainting the reader with the problem, the data brought to bear on the resolution of the problem, the means employed in gathering those data, the ways in which those data were analyzed, and the conclusions reached.

Style of Prose

As noted earlier, various academic disciplines and their preferred style manuals have different standards with regard to style. For instance, the *APA Publication Manual* (2010) prefers that authors write in *active voice* (e.g., "A research assistant interviewed the participants," "Participants completed the survey) rather than *passive voice* (e.g., "The participants were interviewed by a research assistant," "Participants were given the survey). It also recommends that *past tense* be used for the literature review, the description of research methods, and the presentation of the results; *present perfect* tense (e.g., "Theorists have suggested") is sometimes appropriate in the literature review, especially when making generalizations. When *interpreting* the results and presenting the conclusions, however, *present tense* is appropriate. If you are using a word processor,

the grammar checker in your software may allow you to check for inconsistencies in your use of active versus passive voice or past versus present tense.

Most research reports use a somewhat formal and impersonal style and format. There are exceptions to this rule, however; for example, ethnographic studies are sometimes described in a personal, literary, storytelling fashion (see Chapter 6), and historical researchers often tell a story as well (see Chapter 7). Perusing research reports in your own discipline can give you a good sense of the writing style that is most prevalent (and thus most acceptable) in your field.

Although writing in the third person ("The researcher analyzed the data") was the preferred style only a few years ago, increasingly researchers are using the first person to describe their procedures (e.g., "I instructed participants" in the case of a single author, "We analyzed the data" in the case of multiple authors). Use of the third person can be ambiguous; for instance, if you talk about yourself as "the researcher," it may give some readers the impression that you did not take part in your own study! Whichever style you use, however, it is critical that your point of view remain consistent throughout the report. If you are writing a thesis or dissertation, consult with your university's graduate school office about its preferred or required style. If you are writing a manuscript for publication in a particular journal, look for "Instructions to Authors" guidelines in the journal itself or on the publisher's website.

General Principles of Writing

Remember that your report is *you*. Whether or not you intend it to do so, a report can say a great deal about you to your readers. In preparing your report, therefore, several qualities should remain foremost in your mind: (a) neatness, consistency, and clarity; (b) precision; and (c) logical structure.

Neatness, consistency, and clarity. Your pages should be easy to read, with double-spaced lines and clean letters. In addition, you should format the text in a consistent manner, setting tabs for paragraph indents, bulleted lists, and the like, and setting the margins to control for line and page length. Most word processing software allows you to insert footnotes that will appear on the appropriate pages and to create tables that present numbers and text in perfect columns.

The way you set your words on paper, however, is much more than moving your fingers around on the keyboard. Most important is that you express your thoughts clearly and logically. Show how your data resolve your subproblems and how the subproblems resolve the main problem. Lead your readers through your own thought processes step by step. Such tactics provide evidence that you have approached the entire research endeavor in a thoughtful and systematic manner.

These types of things—some trivial and picayune, some more consequential—leave lasting impressions.

Precision. In addition to neatness, consistency, and clarity, a research report must be crisp with precision. There is no place in it for "sort-of's" and "I-guess-so's." This is not the time for ambiguous or foggy terms or half-stated conclusions. Your document should be clean-cut and present your ideas in a straightforward manner.

Every fact has its precise place within the research report structure. You may recall the weeks, the months, perhaps the years ago when you garnered a particular datum or cluster of data related to your study. You did not gather these as a child gathers wildflowers in a field—willy-nilly, without a guiding purpose. You gathered each datum because you envisioned it as a single building block that would support and advance the basic intent of all research: to enlighten a corner of the darkness related to a specific problem. We have come almost full circle, close to the place this book began. Everything you have done has been for a single purpose: to take one problem, one speck of darkness in human experience, and cause it to glow with the light of data and their interpretation, crisply and precisely.

Logical structure. A neat, consistent, clear, and precise report builds on the basic structure of your original research proposal. You may have wondered why we have recommended that you be

so fastidious and particular in drafting a research proposal. Our purpose has been to discipline your thinking and help you construct a logical plan upon which you can later build a clear, logical research report.

This construction of both a plan and a report cannot be done haphazardly. Every step must progress logically toward cracking open the shell of the enigma you chose at the beginning as the goal of your quest. You may understand better now why we titled Chapter 2 "The Problem: The Heart of the Research Process."

After you have written several pages of your research report, go back and read your headings and subheadings. Do they form a logical whole? Do the various levels of heads accurately depict how different sections of text are interrelated? For instance, do they appropriately show that some sections are smaller subparts of other, larger sections? And overall, do the headings show a logical progression? They should. Recall the *inverted pyramid* idea in Chapter 3, "Review of the Related Literature." There we counsel you to "begin your discussion . . . from a comprehensive perspective, like an inverted pyramid—broad end first. Then, as you proceed, you can deal with more specific ideas and studies and focus in more and more on your own particular [central research] problem."

Such strategies are logic in practice. Logic comes from the Greek word *logos,* which means "reason, order, speech, word." Think of your research proposal as a skeleton that holds the body of the report together, the framework on which everything else depends. Now, in your research report, adorn that skeleton with muscle: clear, convincing data. March through each of your subproblems, laying datum upon datum with as deliberate a precision as a mason cements masonry blocks in a skyscraper's wall. Reason, order, and data, carefully placed and cemented with precise words, are the logic of the research report.

PRACTICAL APPLICATION Developing a Writing Schedule

Make no mistake about it, writing a research report—especially writing one *well*—takes considerable time and effort. A research report is not something you can whip up in a few days' time. In the case of a lengthy report, such as a dissertation, you should plan on taking not several days, not several weeks, but several *months* to complete the report-writing process.

We authors can recall too many sad cases in which aspiring doctoral students completed all of the required coursework for their doctoral degrees, passed their written and oral comprehensive exams with flying colors, got approval for their dissertation projects, collected and analyzed their data, and then became "stuck" indefinitely in the process of writing their final dissertations. Some never got unstuck: They never finished their dissertations and therefore never received their doctoral degrees. Such a waste, we think! And so unnecessary!

To help you start *and finish* a lengthy research report—to grease your wheels and keep them greased so that you don't get stuck somewhere along the way—we offer two pieces of advice. First, *develop a reasonable writing schedule for yourself.* Second, *stick to it!* The guidelines that follow can help you do both of these things.

GUIDELINES Estimating Work-Time Schedules

At this point, we urge you to go back and review the Practical Application "Writing Your Proposal" in Chapter 5. Most of the guidelines in "Writing the First Draft" and "Revising Your Proposal" are equally relevant to writing a final research report.

We now offer several additional suggestions. These have emerged from our own experiences in writing research reports (including our own doctoral dissertations) and other lengthy documents (including this textbook!).

1. *Identify small, easily accomplishable goals within the overall project.* A large research report, such as a dissertation, will seem less overwhelming if you break it into small, manageable pieces. These pieces might have such labels as "revision of the methods section," "data analysis related to the first subproblem," "implications section," or "suggestions for future research." Make each piece small enough that you can complete it within a week's time or less.

2. *Set reasonable target dates for achieving each goal.* We strongly emphasize the word *reasonable* here. To get an idea of how much you can write in any given day or week, think about how long it has taken you to finish other lengthy writing projects. For instance, how long did it take you to complete your research proposal? How many pages could you write—and write *well*—in a day? (For instance, one of us authors has learned from experience that she can usually write, at most, about 8 to 10 double-spaced manuscript pages a day. After that, she's essentially brain-dead until the following morning.)

Consider personal matters when you establish your schedule. Do you have a part-time or full-time job to consider? Do you have responsibilities to other family members that will take some of your time and energy? Have you built in adequate time for health and fitness, meals, shopping, home and car repairs, and occasional relaxation? You need to "get real" about how quickly you can complete various aspects of your writing project. Otherwise you will never stick to your schedule; you will be doomed to failure before you even start.

3. *Reward yourself each time you reach one of your goals.* Give yourself a treat of some sort after you successfully finish each piece of your report. Watch a movie, read a magazine or short novel, clean the house, play a few games of solitaire on your computer, surf the Internet—whatever you need to do to get refreshed and ready to tackle the next goal on your schedule.

4. *Seek regular feedback.* We've said it before and we'll say it again: Ask others to give you honest feedback about what you say and how clearly you say it. Honest feedback now can save you more serious criticism—and, we might add, it can save you considerable aggravation and heartache—later on.

5. *Build time into your schedule for at least two or three revisions.* Most research reports are reviewed by others before they ever see the light of day. A committee of university faculty looks closely at any thesis or dissertation. An editorial review board carefully scrutinizes any manuscript submitted to a professional journal. The review process ensures that all approved research reports meet basic standards of scholarship, accuracy, and scientific rigor.

In the case of dissertations, *we have yet to see a report that has not had to undergo at least two revisions.* In fact, a doctoral student often completes four or five rewrites before defending a dissertation before a doctoral committee. Let's face it: The researcher is very close to his or her research project and, at the end, is equally close to the report that he or she has written about the project. So close, sometimes, that omissions, errors, and logical inconsistencies that may be blatantly obvious to others are not at all obvious to the researcher. Furthermore, other people might have useful ideas about better ways to organize a discussion, suggestions about additional statistical analyses that may shed further light on the data, or new sources of literature that may be relevant to unexpected findings. The recommendations that others make, as well as the revisions that occur as a result of these recommendations, have one primary purpose: to make a research report the very best it can possibly be.

Furthermore, you must remember that any report bearing a stamp of approval from other individuals—whether that "stamp" takes the form of the signatures of a doctoral committee or the publication of a report in a scholarly journal—reflects not only on the author of the report but also on those who have approved the report. A poorly written research report makes a lot of people look bad.

The final stages of the writing project, especially the revisions, may seem to go on interminably. But persist! You have expended a great deal of time and effort in conducting your research project, and perhaps others have devoted considerable time and effort to it as well. It is only by completing your report that your project will ultimately contribute to the world's knowledge about the topic you have studied.

PRACTICAL APPLICATION Critiquing a Research Report

Beck (1990) has developed a list of insightful questions that every researcher should answer satisfactorily before submitting a final version of a research report. Although she created it for students and professional colleagues in the field of nursing, we have adapted her list of questions to apply to research report writers in general. The following checklist, based on Beck's original list, should both help you evaluate the reports you read and serve as a guide as you assess your own writing.

✔ CHECKLIST

Criteria for Critiquing a Research Report

Step 1. The Problem

	YES	NO
Is the problem clearly and concisely stated?	___	___
Is the problem adequately narrowed down into a researchable problem?	___	___
Is the problem significant enough to warrant a formal research effort?	___	___
Is the relationship between the identified problem and previous research clearly described?	___	___

Step 2. Literature Review

Is the literature review logically organized?	___	___
Does the review provide a critique of the relevant studies?	___	___
Are gaps in knowledge about the research problem identified?	___	___
Are important previous research studies relevant to the topic included in the literature review?	___	___
Are all cited works included in the reference list?	___	___
Are all works included in the reference list cited in the literature review or elsewhere in the report?	___	___

Step 3. Theoretical or Conceptual Framework

Is the theoretical framework clearly applicable to the problem (as opposed to being a "stretch" in which the theoretical framework in only marginally relevant to the problem)?	___	___
If a conceptual framework is used, are the concepts adequately defined, and are the relationships among these concepts clearly identified?	___	___

Step 4. Research Variables

Are the independent and dependent variables operationally defined?	___	___
Are any confounding variables present? If so, are they identified?	___	___

Step 5. Hypotheses

Are the hypotheses clear, testable, and specific?	___	___
Does each hypothesis describe a predicted relationship between two or more variables included in each hypothesis?	___	___
Do the hypotheses flow logically from the theoretical or conceptual framework?	___	___

Step 6. Sampling

	YES	NO
Is the sample size adequate?	___	___
Is the sample representative of the defined population?	___	___
Is the method for selection of the sample appropriate?	___	___
Is any sampling bias in the method acknowledged?	___	___
Are the criteria for selecting the sample clearly identified?	___	___

Step 7. Research Design

Is the research design adequately described?	___	___
Is the design appropriate for the research problem?	___	___
Does the research design address issues related to the internal and external validity of the study?	___	___

Step 8. Data Collection Methods

Are the data collection methods appropriate for the study?	___	___
Are the data collection instruments adequately described?	___	___
Do the measurement tools have reasonable validity and reliability?	___	___

Step 9. Data Analysis

Is the results section clearly and logically organized?	___	___
Is the type of analysis appropriate for the measurement scale (nominal, ordinal, interval, ratio) for each variable?	___	___
Are the tables and figures clear and understandable?	___	___
Is each statistical test an appropriate one for answering the research question?	___	___

Step 10. Interpretation and Discussion of the Findings

Does the investigator clearly distinguish between actual findings and interpretations?	___	___
Are the interpretations based on the data obtained?	___	___
Are the findings discussed in relation to previous research and to the conceptual/theoretical framework?	___	___
Are all generalizations warranted and defended?	___	___
Are the limitations of the results identified?	___	___
Are implications of the results discussed?	___	___
Are recommendations for future research identified?	___	___
Are the conclusions justified?	___	___

Beyond the Unpublished Research Report: Presenting and Publishing

If you have completed an unpublished research report, such as a master's thesis or doctoral dissertation, consider this: In most cases, only a few people will ever read your report in its current form. If your research project has uncovered new information, new ideas, and new understandings that can make a significant contribution to the world's body of knowledge about a particular topic, then we urge you to seek a broader audience. Two excellent ways to do this are conference presentations and journal articles.

Conference Presentations

Many researchers present their research findings at regional, national, or international conferences. Some conferences are annual or biennial meetings sponsored by societies related to particular academic disciplines (e.g., American Sociological Association, European Association for Research on Learning and Instruction, Modern Language Association). Others are more specific to particular interest areas (e.g., family violence, Piaget's theory of child development). The organizers of many of these conferences eagerly seek presentations (often called *papers*) from new researchers as well as from more experienced ones. Some conferences also include *poster* sessions, which (as the name "poster" implies) involve visual displays of research projects on large (perhaps 4-foot-by-6-foot) bulletin boards. Typically, one or more of each poster's authors is present at the poster session to describe the project undertaken and answer questions.

If you would like to present a paper or poster at a professional conference, you will probably need to submit a *paper proposal* several months in advance to the association or institution sponsoring the conference. These proposals are usually much shorter than the research proposals described in Chapter 5. Furthermore, their purpose is different: You are submitting a proposal to present a research project that you either (a) have already completed or (b) are currently conducting but will definitely have completed before the conference.

Proposals for paper and poster presentations are often only two or three pages in length. Their specific format varies considerably from one professional group to another, and we urge you to consult the *call for papers* that invites proposals for conference presentations. Regardless of the format, one thing is true for all paper proposals: They need to be written with the same clarity and academic rigor required for any research proposal or research report. Furthermore, they need to adhere faithfully to the guidelines that conference sponsors specify.

PRACTICAL APPLICATION Presenting Your Research at a Professional Conference

Many novice researchers find a conference presentation to be a highly anxiety-arousing experience. It's quite common to have some stage fright, especially when presenting a paper to a large audience. You might find it a bit reassuring to know that even many renowned and well-respected scholars still get nervous when they must speak in front of a large group of peers. Knowing you're in good company won't make your public-speaking jitters go away, of course, but it will at least help you realize that you're simply feeling as most people do in such a situation.

The best way to keep your presentation jitters under control is to be well prepared for your paper or poster. Here we offer a few guidelines that can help you put your best foot forward—and thus can give you a confidence boost—in presenting your research project.

GUIDELINES

Presenting an Effective Paper or Poster

Drawing on recommendations by Munter and Paradi (2009) and Nicol and Pexman (2010), as well as on our own experiences, we offer several suggestions for presenting papers and posters at professional conferences:

1. *Be concise and to the point.* If you give a paper, you are likely to have only 10 to 20 minutes to describe what you have done. If you present a poster, your text (including font size) and graphics should be sufficiently large that other people can readily see them from at least two feet away. In either situation, you won't have the time (in the case of a paper) or the space (in the case of a poster) to describe every detail of what you have done and learned. Instead, present those aspects of your project that are key to your audience's understanding of what you have accomplished, including:

- The title of your presentation, plus your name, affiliation, and contact information
- Your research problem and, if applicable, your hypotheses
- A general rationale and context for your study
- A general description of your design and methodology (including the nature and size of your sample)
- Results that are most central to your research problem and hypotheses
- Your interpretations of and conclusions from your data

Many posters also include a one-page abstract immediately after the title page, plus a short list of cited references at the end.

2. *Prepare polished, professional-looking visuals in advance.* One widely used tool for both papers and posters is Microsoft PowerPoint, with which you can create a wide variety of eye-catching visuals—PowerPoint calls them *slides*—including bulleted lists, charts, and graphs. PowerPoint also allows you to incorporate photographs, scanned documents, and (in the case of paper presentations) short videos into your presentation. If you are presenting a paper, you simply hook up your laptop computer to an LCD (liquid crystal display) projector, which the conference organizers typically provide in each presentation room, and click on a mouse or wireless clicker to advance to successive slides.[2] If you are presenting a poster, you print out the slides, either on individual sheets of paper or on a single large poster sheet; an Internet search of "poster presentation template" can give you numerous companies that can convert PowerPoint slides into a high-quality poster.

However, we urge you not to clutter up your presentation or poster with too many visual effects, such as distracting and irrelevant images and animations. Simple images and animations—for instance, having individual bullet points "march" across the screen as you introduce them (which PowerPoint lets you do)—can catch and hold people's attention and so are quite appropriate.

3. *Practice ahead of time, but don't overdo it.* Especially if you are giving a paper, it's a good idea to rehearse it at least once, if only in order to time yourself to make sure you can keep your presentation to the prescribed time limits. It's helpful, too, to review your speaking notes within an hour or two of your presentation. However, we do *not* recommend that you either read or memorize your presentation; by doing these things, you will come across as a mindless robot. Instead, you want to convey the impression that you know your project and subject matter *very well*—something you can do only if you talk somewhat extemporaneously about what you have done.

4. *Prepare handouts that summarize or complement your presentation.* Handouts can take a variety of forms. For instance, your handout might provide small versions of your PowerPoint slides (in the "Print" feature, PowerPoint lets you specify how many slides you print on a single page;

[2]Most PC laptops have a standard outlet for hooking up to an LCD projector. In our experience, however, Macintosh laptops sometimes require special adaptors; check with your local Apple store to be sure you have the appropriate adaptor for your own laptop.

for readability's sake, we suggest three to six slides per page). If your paper or poster is based on a manuscript you have submitted for possible publication, your handout might be a copy of that manuscript. Sometimes presenters instead hand out a slip of paper giving the address of a website at which audience members can download the paper or poster. And in some instances—this is most often the case when someone hasn't planned ahead!—a presenter takes people's e-mail addresses and sends the desired materials after returning home.

5. *Anticipate and be prepared to answer questions.* By their very nature, poster sessions give your audience a chance to ask questions, and most paper sessions also include time for audience members to ask questions. To the extent that you can do so, you should try to anticipate questions and bring any supplementary materials that might help you answer them. But you shouldn't expect that you will be able to answer every question someone might ask. It's quite acceptable—in fact, it's a sign of a candid and open-minded researcher—to respond to some questions by saying, "You raise a good point that I hadn't considered" or "Unfortunately, my study wasn't able to address that particular concern."

6. *Make connections with your audience, including connections you can follow up on after the conference.* Regardless of whether you are presenting a paper or a poster, present *yourself* as someone who is approachable and eager to exchange ideas. Smile, make eye contact, and in other ways convey the message that you want to hear other people's ideas, concerns, and suggestions. And if you don't already have them, get business cards printed that include, at a minimum, your name, credentials, affiliation, and e-mail address.

Journal Articles

An even more effective—and certainly more permanent—way to disseminate your findings and interpretations is to submit a research report to an academic journal. The guidelines we have presented in this book should get you well on your way to writing a manuscript for submission to a research journal, but once again we urge you to *be concise.* As a rule, journal space is at a premium, so journal editors have little tolerance for researchers who say in 100 words what they could have said in 10.

Before you submit a manuscript to a particular journal, read several recent issues of the journal to make sure it is the right place for your article. Determine whether the journal includes research reports, including reports about your general topic, among its articles. Also look at the style of writing that is typical in the journal; you will want to use a similar style in any manuscript you submit. And (forgive us for saying this one more time) seek critical feedback from others about your manuscript, including from people who have published in that journal or similar ones, and use their suggestions to revise and strengthen what you have written.

Sharing Authorship

Whether you are presenting a paper at a conference or submitting a manuscript to a research journal, you must, of course, determine whether you should be sole author or share authorship with one or more other individuals. For example, in the case of master's theses and doctoral dissertations, students often share authorship with their major advisors and perhaps with one or two other faculty members as well.

A general rule of thumb is this: *Individuals who have made significant intellectual contributions to the work should share in its authorship.* Typically, any co-authors have been actively involved in the conceptualization, design, execution, and/or in-depth analysis of the research project. Multiple authors are usually listed in an order indicating which individuals have made the most substantial contributions.

People who have assisted with data collection, coding, computer programming, simple statistical analysis, typing, minor editing, and so on, but who have not contributed *intellectually* to the work, usually do not warrant authorship (Elliott & Stern, 1997; McGue, 2000). Nor do people who have reviewed a paper or manuscript and given their suggestions for how the author(s) might improve it. Such minor contributions are more appropriately acknowledged in a footnote or endnote.

Sharing authorship with others who have contributed in important ways to your research project and listing coauthors in an order that acknowledges their relative contributions are two additional dimensions of the "honesty with professional colleagues" issue we mentioned in our discussion of ethics in Chapter 4. Not only must researchers be honest with their colleagues about what they have done and what they have found but they must also be honest about who has helped them with their research endeavors.

Responding to Reviewers' Critiques

Throughout the book we have offered many guidelines and checklists that, in one way or another, should strengthen either your methodology or your writing and thus, we hope, should help you successfully present and publish your research. Yet not every proposal gets accepted for a conference presentation, and not every manuscript gets accepted for publication in a professional journal. Many proposals and manuscripts get rejected for good reasons. But in some instances, conference program chairs and journal editors simply don't have the space for every good research report that comes their way.

Rejection letters are always disappointing, but we urge you not to let them discourage you. (Even very experienced researchers get rejection letters on occasion.) Typically program chairs and journal editors have had one or more people in the field review your submission, and they are apt to include the reviewers' comments when they give you the bad news. Put these reviews aside for a few days—at least long enough that your frustration and disappointment have dissipated a bit—and then try to look objectively and dispassionately at what the reviewers have had to say. Occasionally a reviewer will be downright nasty, but more often reviewers will have constructive criticisms that can help you strengthen what you have written. You can then resubmit your proposal to another conference or send your manuscript to another journal.

In general, we urge you to *persist* in your efforts to get out the word—and to as broad an audience as possible—about what you have done!

A Closing Thought

As you prepare to write your research report, you might do well to read two books: *The Elements of Style* (Strunk & White, 2009) and *The Art of Readable Writing* (Flesch, 1974). Avoid the overly exaggerated expression; look sharply at your ill-advised and thoughtlessly chosen adjectives. Stick to the facts. Report them accurately but, in so doing, enliven your prose with variety in sentence structure, sentence length, and precision of verb and noun.

More do's and don'ts at this point are probably "TMI"—too much information. We leave you with this last thought. Distilled into a brief stanza by an anonymous hand is a broad guideline for all your writing. Follow it.

The written word
Should be clean as bone:
Clear as light,
Firm as stone;
Two words are not
As good as one.

For Further Reading

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