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Introduction

I (Lammers) will never forget the first time that I presented research to a public audience. It was my first year in graduate school and several of us in the psychophysiology laboratory at Bowling Green State University were invited to travel to an Industrial/Organizational Psychology conference at the University of Tennessee-Knoxville to present research on the role of circadian rhythms in adjustment to shift work schedules. The image of the presentation room lingers in my mind as I write this. I was well prepared but very nervous, and secretly hoping that few would decide to hear our presentation. As the presentation time arrived, my initial hopes were confirmed; only a handful of people were in the audience. My presentation went well. I felt a distinct sense of accomplishment and actually wished that there had been a large audience to hear it. That same sense of accomplishment was felt when my Master's thesis was finally accepted for publication in a scientific journal. What a feeling it was to receive my copy of the journal in the mail and to see my article in among those with authors who were well known in the field and who I greatly admired.

One of the hallmarks of scientific research is that the information is made public and is thus subject to scrutiny and review by the public. Three of the most common means for disseminating research are discussed in this chapter. These include manuscript preparation for a journal article (research report), oral presentation, and poster presentation. You are undoubtedly familiar with journal articles. You may not be as familiar with presentations. If you get the chance to attend a scientific conference, we strongly encourage you to go. Conference programs are almost entirely composed of oral presentations and poster presentations. These are excellent ways to learn about the most recent research in psychology. In addition, nearly all conferences encourage presentations by students.

Chances are that the course for which you are using this textbook requires one or more assignments that relate to the methods of disseminating research or presenting a research proposal. We suspect that this assignment is a source of significant anxiety. This is understandable. Describing your research to another person or persons in a coherent and concise fashion is not easy. But it is an essential part of the research enterprise. We hope that the information presented in this chapter will guide you through the process.

Writing a Research Report

Overview

We will preface our description of the components of a manuscript with some important comments regarding scholarship. Then we will describe in detail the different sections found in scientific reports. There are additional sections dealing with writing style and with ways to avoid sexism in your writing. Other instructions and helpful suggestions for preparing a manuscript appear in the Publication Manual of

the American Psychological Association (2001). The manual is more extensive and more detailed than our comments below. Our comments deal with the most frequent problems undergraduates experience when beginning to write scientific reports. You will want to consult the APA Manual for questions not treated here.

A good research report is a mixture of scholarship and craftsmanship in writing. Both characteristics require time to develop along with considerable practice and feedback from your instructors. In this section we will discuss aspects of scholarship and writing style.

Whether one writes well or writes poorly reflects the person's developmental history in the acquisition of writing skills. Although good writing is an essential requirement for effective communication, it is not sufficient in itself. Good writing must be buttressed by good scholarship. The term scholarship implies such characteristics as accuracy, thoroughness, and objectivity. In addition, the writer must have the highest regard for presenting important aspects of a topic in a precise, unbiased, and fair manner. Special care must be taken to acknowledge and cite the ideas and works of other writers if their material is used in the report. Failure to do so, or to imply that their work is your own when it is not, is called **plagiarism**. It is unethical and can also be illegal. Keep in mind that the author of a written report is responsible for all aspects of its contents. From the inception of the research idea, through researching the literature, data acquisition, statistical analysis, and the final written report, great care must be taken to be honest, accurate, precise, and thorough.

Original Sources

One way to avoid error and to ensure the accuracy and thoroughness of a report is to read the original sources of the information about which you are writing. Relying on secondary sources can result in problems that range from minor inaccuracies to major misstatements of fact. When assertions are made by a writer regarding the work of another writer, it is your responsibility to verify their factual basis before citing them in your report. The only way to do this is to read the original sources they cite. There are many instances in science where a secondary source misstated or misinterpreted the primary source material. Other researchers, reading the secondary source, perpetuate the errors in their writing. When continued by third- and fourth-generation writers, the errors become so deeply ingrained in the literature that they take on the qualities of a myth. At this point, they become exceedingly difficult to refute.

Sections of a Research Report

The behavioral science community has developed a standard format for preparing a research report. This format includes discrete sections that address different aspects of the research. As each section is discussed, we suggest that you continually refer to the complete sample research report in Appendix B. This will help you to visualize the layout and to better understand the nature of the content. Because many

of you will be asked to write a research proposal for this course, we have also included a sample research proposal in Appendix C. The format and guidelines for a research proposal are very similar to those for a research report. A research proposal will not have an abstract section or a discussion section. In addition, the method and proposed results are written in future tense rather than past tense.

Title Page. The title page consists of a header, running head, title, authorship, and author affiliation. The header is right-justified within the top margin of every page and includes the first few words of the title and the page number. Word processing programs have a method for creating a header that will appear within the top margin and will automatically update the page numbers. The running head is an abbreviated title that will ultimately appear on every page of the published article. When you consider a title for your paper remember that most psychologists do not pick up a journal and read it cover to cover. They read what interests them. When they receive their scientific journal (or any magazine), they scan the table of contents for articles of interest. If the title of an article is uninformative or misleading, it may not attract readers to the research. Short and informative titles are preferred (limited to not more than fifteen words). Within these fifteen words you should state with clarity the dependent and independent variables or the theoretical issues with which the article deals. The title should be a statement of content so that it alone can be used by various information retrieval systems. Abbreviations should be avoided. If the title is adequate, it will be referenced appropriately and, thereby, improve the probability that it will gain the attention of its intended audience. Clever titles are permissible if they convey the necessary information and are understandable. Writers with established reputations sometimes use clever titles containing very little information but their works are read routinely because of past contributions to the literature. When working out a title, avoid redundant information. You do not have to include the words *investigation* or *experiment* in the title; that is already understood. Often authors first state the title in a long and fully descriptive way then begin to shorten it to the essentials. For example, the following title "An Investigation of the Choice Behavior of Subjects for Either Predictable or Unpredictable Events" could be reduced to "Choosing Between Predictable and Unpredictable Events." The new title tells us as much as the old one in a more appealing and specific way and with fewer words (fourteen versus six).

When there is only one person responsible for the research project, authorship for the manuscript is not a problem. However, deciding the authorship of a manuscript when several people have been involved can be a delicate issue. Only individuals judged to have made a substantial contribution to the research should be authors. The first author of a manuscript is usually the individual who took the primary responsibility for initiating the research and supervising its completion. Subsequent authorship is assigned in terms of the amount of responsibility taken by each author. Usually, the first author also takes the major responsibility for writing the manuscript. When order of authorship cannot be resolved, some writers have

relied on a coin toss for a decision. Whatever the order of authorship, the professional reputation and responsibility for the content of the manuscript are shared equally.

In addition to the authors, others may have made some contributions along the way (e.g., statistical analysis, review of a draft of the manuscript). It is appropriate to acknowledge their contribution in a footnote.

Abstract. This, too, is an important part of the manuscript and considerable effort should be devoted to writing it. Like the title, it serves indexing and information retrieval systems. If the title is sufficiently informative and interesting, the next step for the journal reader is to go to the abstract. Some readers whose major research interests are in other areas may go no further than the abstract. Clearly the abstract should inform them as fully as possible about the contents of the article so that an informed decision may be made. Other researchers, more directly interested in the topic will read the abstract both for its content and to determine if the manuscript warrants the commitment of the time necessary to reading and understanding it. Whatever the case, the abstract allows the reader to quickly survey the material.

Because the abstract is usually written after the entire manuscript is completed, the flow of the abstract follows that of the manuscript. You can look upon the abstract as a compressed version of the manuscript. It should contain in very brief form all of the important information, such as the statement of the problem, participant sample and characteristics, design, procedure, summary of results, statistical analyses, and conclusions. The abstract may vary in length, but the APA Publication Manual recommends that it be not more than 120 words. No material or information should appear in the abstract that is not in the manuscript. Usually the first several drafts of the abstract are well beyond the 120 word limit. This forces the writer to make decisions concerning the relative importance of the information—then eliminating material considered less important. The number of words can also be reduced by carefully going over the structure of each sentence and saying things more concisely. Eliminating articles and prepositions also reduces the number of words. References are typically not included in the abstract.

Introduction. No heading is required because, in effect, the manuscript begins here. A difficult decision involves judging the level at which the manuscript should be written. Should you assume a highly sophisticated, knowledgeable audience or one that is naive? The answer is neither. Instead, assume a generally informed individual who is not specifically familiar with your topic. How long should the introduction be? It should be long enough to provide sufficient information so that the reader may comprehend the content of your paper. Therefore, for some papers, only a few paragraphs are necessary. For others, the length may be considerably longer.

Your first paragraph should prepare the reader for what is to come. It should broadly identify the problem or question that your research addresses. In fact, the very first sentence could be used to introduce

the general topic of your paper, i.e., what the paper is about—the general thesis. The last sentence of the introductory paragraph could identify the problem, or question more specifically. Sentences between the first and last may be devoted to a brief general rationale leading to the question with which your research deals. You do not state specifically what your independent and dependent variables are, the logic leading to the question, the hypothesis, your expectations, or the procedure that you will use. The first paragraph simply sets up the reader for what will follow.

Intermediate paragraphs should relate to both the preceding paragraph and the paragraph to follow. They are tied together by transition sentences. Transition sentences allow the reader to go smoothly without unexpected changes from one paragraph to the next. A transition sentence may be the first sentence of a new paragraph or it may simply include a word or idea that ended the last paragraph. For example, after describing one approach to a problem, you then state either at the end of one paragraph or the beginning of the other, "Badia suggested a different approach to the problem." Words such as *therefore*, *nevertheless*, *however*, *of course*, are often used with transitions. An outline containing main ideas, literature survey, etc., may help you write a smoothly flowing introduction. Also, read carefully the section on writing style in Chapter 2 of the APA Manual.

These intermediate paragraphs should be used to develop a logical argument and rationale for your research, the origin of the problem and a summary of the present state of knowledge. The directly relevant research is reviewed in these paragraphs. This background literature is not intended to be exhaustive. You simply summarize the major points of directly relevant literature. If exhaustive general reviews of the literature are available, you can refer them to the reader. In these paragraphs you acknowledge the work of others that relates to your research, and also any theoretical development that you wish to undertake. A critique of previous research may be given if it relates to the purposes of your study. Whatever your interest, it is important that you develop a rationale (a logical argument) for your research, i.e., how did your study evolve?

To help you organize the sequence of material in these intermediate paragraphs, you might think about a funnel. Start off broad and gradually narrow your topics and ideas as they become more directly related to the hypothesis and methodology of your study. A good introduction should lead the reader to the hypothesis in your final paragraph. In fact, a very good introduction will result in the reader being able to anticipate your study and your hypothesis even before reading about it in the final introductory paragraph.

In the final introductory paragraph you summarize for the reader what you have been saying in preceding paragraphs. You restate your problem, summarize your arguments, and present your rationale or logic. You make it clear for the reader what the specific purpose of your research is and indicate how you intend to provide an answer. It is important that you be specific about your hypothesis, your expectations,

or your predictions. Your rationale must follow logically. To be specific means that you will have to identify your dependent and independent variables, describe in general terms the procedure used to test your hypothesis, and articulate what you expect to find.

Method. The method must be appropriate for the problem or question under investigation. How did you go about answering the research question? This section must be sufficiently descriptive to allow a reader to evaluate how well this was done. It must be sufficiently complete to allow others to replicate your method. For some aspects of the study, considerable detail will be necessary; others will require less detail. You must make this decision. Too much detail concerning relatively unimportant information may be more confusing than helpful. Keep two things in mind when deciding on details: (1) are they important to the outcome of the study, and (2) are they necessary for understanding or for replicating the study? The method section is usually divided into subsections that include *participants*, *apparatus* or *materials*, *procedure*, and, in some cases, *design*. This division is for the reader's convenience when questions arise regarding specific information about the method. The method section should be written while you are conducting the experiment. Trying to reconstruct it at a later time may be difficult and some important details may be omitted.

The first subsection of the Method section is *Participants*. Here we include details regarding the participants of the study. Who were they? How many? Their sex? Age or age range? How were they selected? Were they paid? Volunteers? Was participation a class requirement? Geographic area? Did any participants fail to complete the study? Why? Were the data from any participant discarded? Why? Were they informed of the hypothesis being tested?

Different details are necessary when animals are used. We must specify the genus, species, and strain. In addition, the vendor from whom the animals were purchased must be specified. It is also necessary to give their sex, age or age range, and weight. How were they housed and maintained? Was any special treatment given?

The second subsection of the Method section is *Materials/Apparatus*. This section should not be confused with the following *Procedure* section. It is sometimes difficult not to do so. Include in this section the apparatus and materials used in the experiment. In some cases, only testing material will be used. If so, important information regarding the tests must be given. Under this circumstance, the title of this section might be changed to *Materials* or *Tests*. When commercial laboratory equipment is used, identify the model number and the company. Custom-built equipment that was central to the research should be described in sufficient detail to allow others to build it. In the latter case, a drawing or photograph may also be helpful.

The third subsection of the Method section is *Procedure*. Detail is necessary in this section. The questions that must be clearly answered are: "What did you do and how did you do it?" State precisely

what treatment was given to each participant. If different groups received different treatments, be sure that your description identifies these differences. Independent, dependent, and control variables must be clearly identified for the reader. Identify experimental and control groups and indicate how they were formed. Time intervals, durations, and sequences of important events should be described. Instructions should be summarized or paraphrased. If instructions are studied themselves as an independent variable, then they should be presented verbatim. If counterbalancing or randomization is used, describe how this was accomplished.

Some Method sections include a *Design* subsection. For some complex experiments a design section may be appropriate. If so, then this section would include the type of experimental design that was used (e.g., within subjects, between subjects, mixed design) along with the treatment conditions and a description of the statistical analyses or model. When a design section is used, some of the material in the procedure section would be placed in this section.

Results. This section is used for describing the results of the research and for evaluating their reliability. It is sometimes difficult to present your results without also discussing them. In fact, on occasion, some writers do combine the Results and Discussion sections under one heading. However, more often than not, the two sections are kept separate. All data relevant to the purposes of your research should be presented, whether favorable or unfavorable to your views. Different formats, in addition to verbal description, can be used. Tables and figures are the most common method used to supplement and clarify the verbal description. They are intended only as supplements and should not serve as the only source of information regarding results. Avoid presenting the same data in several places. (If data appear in a table, they generally should not appear in a figure and vice versa.)

Different methods are used to determine whether the obtained results are reliable (significant). When group data are presented, the results are usually analyzed statistically and their reliability (significance level) reported in terms of a *t*, *F*, χ^2 , or other statistics along with a given *p* (probability) value. When a single-subject approach is used, data from individual participants are presented and their reliability is assessed by intra-participant and inter-participant replication.

A reasonably standard format is used when reporting tests of significance. First, a verbal description of the results (data) is given. This is followed by presenting the outcome of statistical analyses of these results. For example, after describing the data obtained with Groups A and B under two different conditions, you might then report the following: "The difference between Group A and B under the first condition was significant, $F(1,21) = 9.01$, $p < .01$, but it was not significant under the second condition, $F(1,21) = 1.55$, $p > .05$." Note the manner in which the statistical test is reported. First, the symbol of the statistic is given (italicized), followed by the degrees of freedom (parentheses), an equal sign followed by

the value of the statistic, a comma, an italicized lower case p (probability), followed by a less than < or greater than > or equal = sign, and finally the level of significance. Again we state, it is important to first describe your data and only then give the outcome of tests of significance.

Discussion. If the experiment is a simple one with few findings reported in the Results section, you can begin the discussion with a clear, unambiguous statement of the contribution that your study makes. If a question was raised or a hypothesis stated, you should make a direct statement regarding an answer to the question or whether the hypothesis was or was not supported. When the Results section consists of many findings, it is appropriate to open the discussion with a brief summary of your findings.

The important points brought out in the Introduction should be addressed in your Discussion. Also the major findings of your study should be evaluated and interpreted. In this section you describe the relationship of your findings to those of others and identify existing similarities and differences. You may want to emphasize some of your findings while qualifying others. Indicate whether your procedure, subject population, or experimental manipulations restrict or limit the generalizations that can be drawn. Theoretical speculation closely related to your data is appropriate in this section. However, avoid rambling ideas and speculation distant from your data. The practical implications of your data, if any, should be noted here. If you feel that your study has some unusual strengths, then it is appropriate to note them. Also, weaknesses, if any, should be briefly identified with suggestions to correct them. You may want to conclude your discussion by pointing to future research. The insight derived from your study may suggest additional research or even a different direction that should be undertaken.

References. Only references cited in the report are included in the Reference section and these are ordered alphabetically by the first author's last name. The Reference format described here is simple and efficient but it differs from that used by some other professions. There are usually four components of each reference: author(s), title, publication, and date of publication. The format differs among journal articles, authored books, edited books, chapters appearing in edited books, electronic sources, unpublished manuscripts, etc. Because such a wide variety of sources exist, you should consult the APA Manual for the proper format for the particular type of source you are referencing. Samples from a few of the more common source types are shown below.

Journal Article

Lammers, W. J., Badia, P., Hughes, R., & Harsh, J. (1991). Temperature, time-of-night of testing, and responsiveness to stimuli presented while sleeping. *Psychophysiology*, 28, 463-467.

Authored Book

Ramachandran, V. S., & Blakeslee, S. (1998). *Phantoms in the brain: Probing the mysteries of the human mind*. New York: William Morrow and Company, Inc.

Edited Book

Benjamin, L. T., Nodine, B. F., Ernst, R. M., & Blair-Broeker, C. (Eds.). (1999). *Activities Handbook for the Teaching of Psychology: Volume 4*. Washington, D.C.: American Psychological Association.

Chapter in a Book

Lammers, W. J. (1999). Reading, writing, and thinking before each class. In L. T. Benjamin, B. F. Nodine, R. M. Ernst, & C. Blair-Broeker (Eds.), *Activities Handbook for the Teaching of Psychology: Volume 4* (pp.). Washington, D.C.: American Psychological Association.

Tables. Tables are not intended to duplicate the text of a manuscript. They are used to supplement it and to display a large amount of data in a clear and compressed way. Whenever a table is used, it must be referred to in the text. However, it is not necessary to launch into a detailed description of all the data in the table. Only the most important data need be described. Tables are sometimes difficult to construct and they require both thought and trial and error. For helpful suggestions, the APA Manual should be consulted. Tables are always referred to by number, e.g., Table 1, Table 2, etc., and they require a brief but explanatory heading. Often headings identify the dependent and independent variable. Tables may also have footnotes immediately below them that provide additional information to make them easier to understand.

Figures. Another way to present considerable data in a clear and compressed way is to use figures. As with tables, each figure must be referred to in the text along with a description of the important data they display. They, too, are used only to supplement the text. Figures are also referred to by number, e.g., Figure 1, Figure 2, etc. and they must be accompanied by a figure caption (title). The caption is usually descriptive and includes the dependent and independent variables that compose the figure. If additional information is needed to identify specific groups or conditions, then a legend is included (e.g., open circles = placebo group, closed circles = experimental group). The vertical and horizontal axes must be clearly labeled. Heavy dark lines should be used when drawing these axes. The dependent variable is plotted along the vertical axis while the independent variable is plotted along the horizontal axis. Usually no more than four curves should be plotted on any figure. Careful consideration should be given to the proper scale that is used along the ordinate. It is possible to distort the visual display of the findings by using different scale values. Decimal values, e.g., .1, .2, etc., may exaggerate the obtained differences while a scale value in units of 10, e.g., 10, 20, etc., might minimize the obtained differences.

Appendixes. The most common reason for including an appendix is to present detailed information about the experimental method that would be too cumbersome to include in the actual Method section of the paper. These might include examples of the visual stimuli presented (word lists, pictures, etc.) or a questionnaire that was used. As the author, you can simply refer the reader to the appendix at the

appropriate place in the paper (e.g., “photos of people with different body types were presented to participants for five seconds each. The appendix illustrates the actual photos that were used.”).

Arrangement of Manuscript

The APA Publication Manual specifies a precise arrangement of the manuscript. This arrangement is necessary when submitting a manuscript to a journal for publication. It differs in a number of ways from the appearance of the published article. Many instructors request that the report be submitted on a form similar to the published article. In particular, tables and figures might be placed in the Results section where the data are described. The APA Manual suggest the arrangement below:

1. Title page (separate page)—includes running head, title, authors, affiliation.
2. Abstract (starts on separate page)—the word "Abstract" centered at top of page. No title, author affiliation, or paragraph indentation.
3. Pages of text (starts on separate page)—title at top of page but no author or affiliation noted. Do not start a new page because of a heading (e.g., Method, Results, Discussion) until References.
4. References (starts on separate page).
5. Footnotes (starts on separate page).
6. Tables (each on a separate page).
7. Figure captions (starts on separate page)
8. Figures (each on a separate page).
9. Appendixes (each on a separate page).

Headings

There are three levels of headings usually found in written reports: main headings, side headings, and paragraph headings. Short papers may need only one or two levels of headings.

Main Headings

Main headings are the principal headings. They are centered on the page, the first letter of each main word is capitalized, and no period is placed at the end. With all headings, use of bold font to highlight the text is recommended.

Side Headings

The second level of headings is referred to as side headings. These headings are typed at the side of the page flush with the margin. Again, the first letter of each main word is capitalized; all words are italicized, and no period is placed at the end.

Paragraph headings. The third level of headings is referred to as a paragraph heading. These headings are typed with the paragraph indentation as here. Only the first letter of the first word is

capitalized. The heading is italicized, the last word is followed by a period, and one space later the text begins.

Writing Style

Some very helpful guidelines regarding writing style are described in the APA Publication Manual (2001). As noted earlier, Chapter 2 of the Manual is particularly helpful. In addition to working on improving your writing style, it is necessary to develop skill in using language in your writing that is not biased by gender, sexual orientation, race, disabilities, or age. These issues are also addressed in Chapter 2 of the manual.

Writing the Manuscript

For many, the most difficult task of doing the research is writing the report. Writing is a solitary activity and it is not compatible with socializing. To write a concise, coherent report requires planning, persistence, skill, and concentration. It is easy to put off writing until the deadline is upon you. For many, simply getting started writing is a very difficult task. Other tasks are suddenly given higher priority or they become more urgent. One major reason for procrastinating is that the task of writing the report seems overwhelming. You are probably thinking of going from the beginning to the final copy—from "start" to "finish" in one marathon session. You are concerned about getting all the ideas in the report and expressing the ideas adequately.

Let's look at some procedures that should be helpful for writing your report. Perhaps the single most important consideration is to allow sufficient time to complete the report. Don't hobble yourself with added stress of fighting a course deadline. Consider the advantages and benefits that you will derive from finishing early. Set a realistic deadline earlier than the one set by the instructor. Perhaps you can use some self-control techniques, such as rewarding yourself for progress and punishing yourself for falling behind.

To make the task of writing the report more manageable, consider doing one section at a time. You do not have to start with the introduction and proceed through each section in their given order. There are no binding rules concerning which section should be written first. Begin with the section that is of greatest importance to you. Once this decision is made, then develop an outline that will organize what you want to say. If your notes and references are on cards (3 x 5 or 5 x 7), you can arrange them in the order you plan to write as an alternative to the outline.

After the outline is arranged, then start to write. Let your ideas flow. Do not worry about revising and restructuring your sentences. Writing and revising are two different tasks requiring two different mental sets. Revising requires more intense effort and concentration on a single sentence. Writing requires that the ideas and thoughts simply be expressed. After the ideas are out, some reorganization can take place and sentences can be refined or restructured. Your first draft will be and should be "rough."

Upon completion of the first draft, begin the task of revising it. Is the organization reasonable? Correct errors in spelling, grammar, and logic. Look at your sentences and word structure. Are there any ambiguous expressions or awkward sentences? Again, do not attempt to compose a final polished report. After this second revision is complete, place the report aside for a few days. Placing the report aside is important for several reasons. It allows you to do other things that may be beginning to distract you. Setting the report aside also allows you to return to it with a different perspective. Errors become more glaring, cumbersome sentences stand out, needed revisions become more obvious. Also, new insights may occur during the period the report was set aside. During the period you may want to have a fellow student read the report simply for clarity. Often a fresh reader can detect unclear or confusing statements that you may have repeatedly missed.

In completing the final draft, do not be satisfied with anything less than your best efforts. You should also be your own severest critic. If you would like a standard with which to compare your writing, ask your instructor to name a few excellent writers whose published works you can read. It is sometimes helpful to observe their writing style when trying to improve your writing skills. You can develop your own distinctive style after you have mastered some of the basic skills.

As another aid to your writing of a research report, we present below the guidelines that one of your authors uses when he grades student research reports. It is likely that your course instructor uses similar criteria.

Making an Oral Presentation

Purpose of an oral presentation

The bulk of any scientific conference consists of oral presentations. In most cases, these presentations represent the researcher's most recent findings. Thus, it is an important way for researchers to stay abreast of new developments in the field. It also provides an opportunity for the researcher to receive feedback from others through both formal and informal question/answer sessions at the conference.

Typically, a conference will put out a call for submissions several months prior to the conference. Researchers then submit an abstract of their proposed presentation, it is reviewed, and then either accepted for the program or rejected. The level of peer review is much less stringent than that for publication. Opportunities exist for student researchers to present at their own university, at regional conferences, and at national conferences.

Sections of the presentation

The organization of the presentation is at the discretion of the presenter. However, an oral presentation of research findings typically follows a format similar to that of manuscripts. There is an introduction, a description of the methods, a presentation of the results, and a discussion of the findings.

Working from notes

In some cases, the researcher makes an oral presentation by simply reading a written manuscript. In many cases, student researchers make their first presentation by reading a written research report. We do not recommend this! How much do you enjoy a professor lecturing by reading his/her notes from a lectern. Such presentations can be good but are more often boring. You should know your research project well enough to simply talk about it, using an outline or note cards to remind you of important points that you want to make. Another useful strategy is to let your visual aids serve as your outline and notes.

Visual aids

Visual aids come in the form of written outlines, pictures, tables, figures, and more recently, websites on the internet. They can provide organization to your presentation, help describe your experimental design, help describe your results, and help summarize your major points. Overhead transparencies are still a very popular method of displaying information to an audience. Electronic presentations (e.g., Powerpoint, Corel Presentations) are becoming popular and offer new opportunities for video clips and linking to sites on the internet. It is wise to remember that technology does not always function properly and you should have overhead transparencies as a backup. Whenever visual aids are used, presenters should use a minimal amount of text, sufficiently large text for readability, and a method for progressively revealing relatively small amounts of text. Another nice feature of many presentations is the use of a laser pointer. With this,

you can direct the viewer attention to a particular part of the visual display (e.g., a particular data point on a graph).

Speaking tips

As many of you know firsthand, public speaking can cause anxiety. Often, it is this anxiety that leads to behaviors during public speaking that make the presentation less effective. As a speaker, you should make eye contact with the audience and shift your gaze around the room. This requires that you not read a set of written notes or the text projected on a screen. You should also avoid the danger of speaking too fast. Your audience needs time to process the information that you are presenting. This is especially true when presenting information in a table or figure. You must remember that you are very familiar with the data and that this is the first time that your audience has viewed this information. Try to avoid ums and uhs. Be sure to practice your presentation several times and to deliver it with enthusiasm. As noted at the beginning of the chapter, making a high-quality presentation takes much effort but also results in a very rewarding sense of accomplishment.

Table 16.2 Quick Tips for an Effective Oral Presentation

1. Develop sections similar to that of a manuscript.
2. Present from notes; do not read your presentation.
3. Use visual aids (outlines, figures, table, pictures, video, Web sites).
4. Relax.
5. Make eye contact with the audience.
6. Speak slowly.
7. Avoid ums and uhs.
8. Be enthusiastic.
9. Practice, practice, practice.

Making a Poster Presentation

Purpose of poster sessions

Poster sessions provide yet another way for researchers to disseminate information and are a common feature at scientific conferences. Normally, poster sessions last about one hour and there may be 50 other posters set up in the same room. At least one of the authors remains with the poster during the session. Attendees will often peruse the poster titles and stop at those that arouse interest. Because at least one author is present, poster sessions provide a wonderful opportunity to meet and talk with the researcher.

Sections of the poster

Although APA guidelines do not apply to posters, the sections are often the same as a research report. Thus, most posters include abstract, introduction, method, results, and discussion sections. Because there is limited space and because an author is available to fill in details, the actual text in each section is much more concise. In addition, posters are very amenable to visual depictions of data in the form of figures and tables.

Layout of the poster

The layout of the poster should be user-friendly and should maintain a professional appearance. The organization hosting the conference will typically provide submission guidelines with specific details regarding poster size and format. The title should be clearly visible from a distance and should be descriptive. The poster should include the authors, their affiliations, section headings, and visual aids. The main text should be in a large font size (16-18 pt) so that it is readable from a distance of three feet. Each section should be positioned on the poster so that there is a clear flow from the left side of the poster to the right side. Figure 16.1 provides a sample layout.

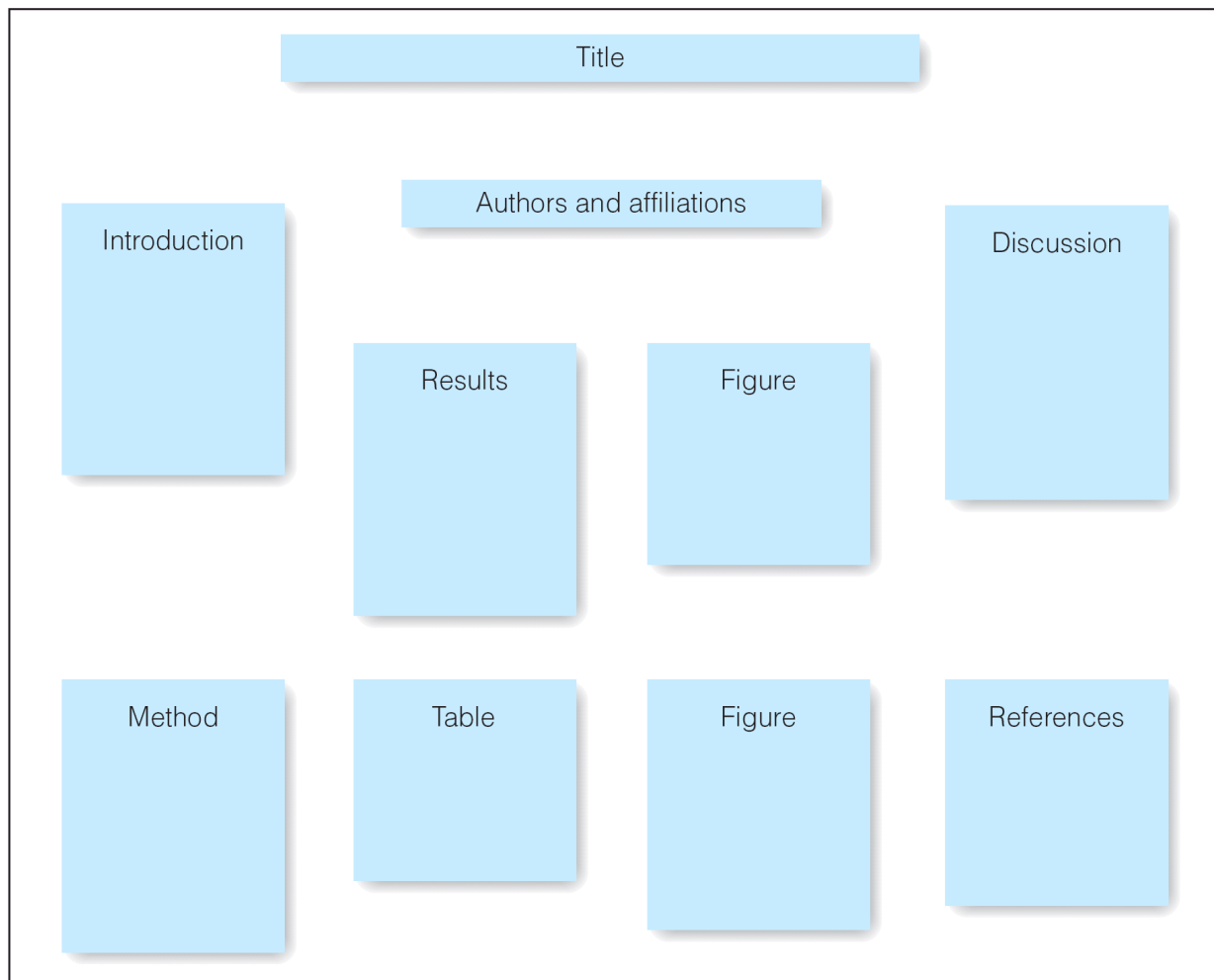


Figure 16.1 Sample layout for a poster presentation

Researcher's role during the session

As mentioned above, at least one of the researchers should stand with the poster. When someone approaches the poster, the researcher should introduce him/herself, offer to provide a summary, offer to provide a handout, and offer to answer any questions. This is a more proactive approach than most presenters take, but we believe that it makes a positive impression and encourages interaction among researchers.

Table 16.3 Quick Tips for an Effective Poster Presentation

1. Provide a descriptive title.
2. Clearly label all sections of the poster.
3. Use a large font size (16–18 pt.).
4. Make the text concise.
5. Use graphs and tables to show results.
6. Use a professional look.
7. Have handouts available.
8. Be prepared to summarize your study.
9. Be prepared to discuss your study with others.

General Summary

Behavioral research is most often disseminated via published research reports, oral presentations, and poster presentations. This is an essential part of the scientific process and researchers should learn to do it well. Guidelines for writing research reports are provided by the publication manual of the American Psychological Association. This manual describes the content, organization, and style of a manuscript. Both oral presentations and poster presentations are important components of many scientific conferences. Both presentation types should include clear and concise information, professionalism in materials, professionalism in speaking, much preparation, and much practice. Research is not valuable if it is not communicated well to others.

Detailed Summary

1. An important component of scientific research is the dissemination of information to the public and the subsequent scrutiny and review by the public.
2. Written research reports are the most common means by which scientific information is shared with others.
3. The Publication Manual of the American Psychological Association (2001) provides extensive guidelines for writing and formatting a research report.
4. A quality research paper is clearly written, concise, thorough, objective, precise, unbiased, and acknowledges the ideas of others.
5. Accuracy and thoroughness rely on information from original sources rather than secondary sources. Relying on secondary sources can result in problems that range from minor inaccuracies to major misstatements of fact.
6. The behavioral science community has developed a standard format for preparing a research report that includes title page, abstract, introduction, method, results, discussion, references, tables, figures, and appendixes.
7. The title page consists of a header, running head, title, authorship, and author affiliation. It is particularly important that the title be both brief and descriptive.
8. The abstract is a brief summary of the entire research paper.
9. The introduction section provides a broad introduction to the topic, a review of the relevant literature, a basis and rationale for the study, and a precise statement regarding the research hypothesis.
10. The method section describes the participants, apparatus/materials, and procedures in sufficient detail to enable someone else to replicate the study.
11. The results section provides both descriptive and inferential statistics to evaluate the data. Presentation of data in tables and figures can be a useful way to summarize and describe data.
12. The discussion section summarizes the findings, relates the findings to the hypotheses, relates the findings to what other researchers have found, notes advantages and limitations of the study, and discusses possible future research in the area.
13. Writing is not easy. Writers should allow sufficient time before deadlines, have someone else read the paper and provide feedback, and revise the writing until it is the best that can be achieved.
14. Much of the most recent research is orally presented by researchers at scientific conferences.
15. Effective oral presentations require that the presenter organize the talk, present from notes, use visual aids, relax, make eye contact, speak slowly, be enthusiastic, and practice.
16. Poster presentations are very popular at conferences and provide an informal method for sharing research and discussing the research with the author.

17. Effective posters provide a descriptive title, clearly label all sections of the poster, use a large font size, use concise text, use graphs and tables, and look professional. An effective presenter has handouts available, is prepared to summarize the study to visitors, and is prepared to discuss the study with visitors.

Key Terms

Plagiarism