

TOPIC 86

REPORTING RESEARCH RESULTS

The **Results** section is where the specific outcomes of the research project are presented. This is the place to report specific findings and summaries of data.

When research has tested a hypothesis or multiple hypotheses, these are restated and used to organize the presentation of results. It is usually best to report the results separately for each hypothesis, purpose, or question in the order in which they were introduced. For instance, if there were two hypotheses, restate the first one, and present the data for it. Then, restate the second hypothesis, and present the data for that one.

In reports of quantitative research, researchers typically do not describe the steps required to complete the statistical analyses. The researcher will simply report the means and standard deviations relating to a hypothesis without discussing computational details. The statistical tests that were used and the program in which they were analyzed may be identified here or in the Methods section. In these reports, descriptive statistics (e.g., mean, standard deviation, and percentage) are reported first, followed by the results of tests of statistical significance (e.g., chi-square, *t*-test, and ANOVA). This is illustrated in Example 1. Note that when there are hypotheses, the researcher should explicitly state whether each hypothesis was supported by the data.

Example 1

Beginning of the Results section in a quantitative research report: The first hypothesis was that participants who attended the extended training sessions would report more satisfaction with the program than those who attended the abbreviated sessions. The mean satisfaction score for the extended group was higher ($m = 24.00$, $sd = 1.50$) than the mean for the abbreviated group ($m = 22.00$, $sd = 1.40$). The difference between the two means is statistically significant at the .05 level ($t = 3.30$, $df = 21$). Thus, the first hypothesis was supported. The second hypothesis was that participants. . .

When there are a number of related statistics to report, it is usually best to present them in a table (instead of reporting them in sentences). Example 2 shows a table with a number of descriptive statistics. Highlights of the information displayed in statistical tables should be described in the Results section with statements such as "The means in Table 86.1 show that the supervised practice group outperformed the unsupervised practice and control groups."

In the Results section, the statistics are described and contextualized in relation to the research question or hypotheses, but the researcher will reserve for the **Discussion** section any generalizing from the data or analysis of the overall meaning of the results. The Results section is used to offer a presentation of the data and for providing context about specific results that may require elaboration.

Example 2

TABLE 86.1 Posttest Statistics for Three Groups

Group	*n*	*m*	*sd*
Supervised practice	21	55.78	8.27
Unsupervised practice	20	49.02	7.66
Control group	22	46.35	9.36

In qualitative research, the Results section differs in a number of respects. First, there is usually a discussion of the steps taken to analyze the data. This may be placed under a subheading such as *Data Analysis* (see the outline in the first column of Topic 81).[1] Here, the method of analysis (such as grounded theory or consensual qualitative research) should be named and the steps taken to implement the method described (e.g., how many coders were used and how a consensus was reached).

Take as an example a qualitative study on why people continue to use complementary and alternative medicine (CAM).[2] In this study, the introduction/literature review explains that the aim of the study is to explore why CAM consumers continue or end their use of a CAM practice. It situated this question as unique and relevant. Then the Methods section explained the approach (fieldwork) where the data was collected and further defined what treatments were included in this study of CAM (homeopathy and herbalism, for instance). It provided facts about the locations for data collection that argued for their appropriateness. A subsection also covered informed consent processes that were used in the study under the subheading *Ethics.* Next, a subsection on data generation and collection provided details on the amount of time and the times of day spent in the data collection locations. That subsection also explained the research approach for collecting fieldwork and interviews, including the logic for using these data collection techniques based on the goals of the research. It outlines the number of people who were interviewed, their demographics, and the treatment they were receiving. The data analysis follows, explaining the techniques used:

Example 3

Audiotapes were transcribed verbatim (and transcriptions reviewed for accuracy) and field notes were typed up both during and immediately following the fieldwork. Atlas.ti (Scientific Software Development, GmBH, Berlin, Germany) [a qualitative data analysis program] was used to facilitate data organization, management, and analysis. The analysis began during the fieldwork when initial impressions of both potential themes and the direction of the research were noted. Following the fieldwork and a period of data immersion, the textual data were first analyzed using inductive open coding[. . . .] As the analysis progressed other techniques were also employed, including axial coding. [. . .] In the final stages of analysis, the aim was to develop process-oriented themes that answered the analytic question, "what is happening here?" Three main process-oriented themes were developed that could explain the bulk of the data and provide insights into consumers' behavior.

After the researchers in Example 3 finish describing the data analysis, the Results section goes on to present each theme and describe it in greater detail, supported with quotations that provide illustrations of the theme in the participants' words. Qualitative researchers do not present statistics but may use different tables or graphs to illustrate the primary themes or theories. The Results section of a qualitative research report typically concludes in this manner, using each theme as a subheading within the Results section with verbatim quotations from participants that illustrate its meaning. Researchers save their own overarching explanation of the meaning of their findings for the Discussion section.

TOPIC REVIEW

1. For research that has more than one hypothesis, purpose, or question, is it usually best to report the results for each one separately? If so, in what order?
2. In reports on *quantitative research*, do researchers typically indicate how the statistical results were computed (e.g., do they name the statistical computer program used)?
3. Should "descriptive statistics" *or* "results of tests of statistical significance" be reported first?
4. When statistical tables are included in a Results section, which of the following is true?
   A. The tables should be presented without commentary.
   B. Highlights of the contents of statistical tables should be mentioned.
5. Is a subsection titled Data Analysis more likely to appear in reports of "quantitative research" *or* "qualitative research"?
6. Are verbatim quotations more likely to appear in reports of "quantitative research" *or* "qualitative research"?
7. Do reports of "quantitative research" *or* "qualitative research" tend to have shorter Results sections?

DISCUSSION QUESTIONS

1. Locate a published report of quantitative research in a peer-reviewed publication within your discipline. Examine it to answer these questions: What statistics are reported and how are they organized? How does the text in the Results section address the information in the tables? Note the differences in the content covered in the Methods, Results, and Discussion portions of the paper. Did the paper include detailed information in these areas?
2. Locate a published report of qualitative research in a peer-reviewed publication within your discipline. Examine it to answer these questions: Is the Results section organized around themes? Does the Results section contain verbatim quotations from participants? Note the differences in the content covered in the Methods, Results, and Discussion portions of the paper. Did the paper include detailed information in these areas?

RESEARCH PLANNING

Examine research articles that use similar methods. Look for topics similar to your own, and look at different topics within journals that might interest you for publication. How is the organization of the Results section in the article similar to the organization you plan to use?



TOPIC 87
WRITING THE DISCUSSION

The last part of the body of a research report is the **Discussion**.[1] This is the place where the researchers explain the overarching meaning of their project. The introduction and literature review began the project by framing the question, its meaning, and how it fits with prior published research. The rest of the sections leading up to the discussion provided all the necessary documentation to explain details about the questions, the approach used to answer it, the participants, the measures through which data was collected, the method of data analysis, and the meaning of variables or themes. The details of the data itself have been presented in the Results section, with explanations as needed to understand it. Now, in the Discussion section, the author does not need to account for these details but can simply describe the relevance and significance of the overall findings.

While there are many ways in which a Discussion section may be organized, certain types of information are usually included. A good way to begin is to restate the *original purposes of the research*, which may have been stated as research questions, purposes, or hypotheses. Next, indicate the extent to which the purposes were achieved as represented by the *research results*. Example 1 shows how the first two elements in a discussion might be presented. Note that specific statistics usually do not need to be presented here because a reader can refer to the Results section for them.

Example 1

Beginning of a Discussion section: The purpose of this study was to test three hypotheses regarding the relationship between stress processes and socioeconomic health disparities. The first hypothesis was that stress processes would be directly related to health disparities in a sample of U.S. adults at midlife. This hypothesis was strongly supported by the data. The second hypothesis was. . .

Notice that the researcher who wrote Example 1 indicated that the hypothesis was "strongly supported." If a researcher knows of serious methodological weaknesses in the execution of the study *or* if the effect size is small (see Topics 75–77), more tentative language should be used, such as "The data offer limited support for the first hypothesis." In qualitative studies, the Discussion section follows a similar path. Researchers may begin the discussion by restating the themes and their relation to one another and relative strength, and then describe the theory that has emerged or is supported by the themes.

At this point, it is appropriate for either qualitative or quantitative studies to briefly compare and contrast their results with those reported in the literature review (e.g., "The support for this hypothesis is consistent with the results in a prior survey by Doe [2012]"). If any results of the current study are surprising in light of the information in the literature review, this should also be pointed out. For instance, a researcher might state, "The failure of the data to support the hypothesis for young children is surprising in light of the strong

support for the hypothesis in the earlier experiment by Jones (2011), in which adolescents participated. A possible explanation for this inconsistency is. . ."

When the results have practical *implications*, these should be explicitly stated, and the researcher should indicate what actions a particular person, group, or organization should perform. In Example 2, the organization is "public health agencies," and the action is "providing bilingual diabetes outreach programs."

Example 2

Practical implications in a Discussion section: The low rate of compliance by the Hispanic adults, most of whom were born in Mexico, may be due to language interference. Because many of these participants might not be fluent in English, public health agencies should consider providing bilingual diabetes outreach programs.

The Discussion section is an appropriate place to describe *limitations* (i.e., methodological weaknesses) and to indicate how the limitations might affect interpretations of the results. Although typical limitations are in sampling and measurement, a variety of other methodological problems may have affected the results and should be considered in their interpretation. Example 3 indicates the nature of the limitation in sampling *and* its potential impact on the results.

Example 3

Sampling limitation in a Discussion section: The volunteer sample for this survey consisted of disproportionately high middle- and high-socioeconomic-status individuals. Thus, the need for assistance in acquiring healthy food resources (e.g., fruits and vegetables) may have been underestimated in this study.

In the Discussion section, it is also appropriate to suggest directions for *future research.* Such suggestions should be specific because it is of little value to consumers of research to simply state that "more research is needed." Example 4 shows a discussion of future research. Notice that the suggestion is specific (i.e., use of a more limited vocabulary).

Example 4

Directions for future research in a Discussion section: Because participant feedback indicates that some participants found the questionnaire difficult to comprehend, researchers should consider using a more limited vocabulary when constructing questionnaires during future research on this topic.

If a Discussion section is long, researchers sometimes include subheadings to guide readers. On the basis of the above material, here are subheadings that might be used in the Discussion section:

Research purposes and results
Implications
Limitations
Directions for future research

The Discussion section distills the major findings and draws the deeper connections of this report's relevance to the discipline and to the part of the world under study. The entire process has led up to being able to make claims in this part of the paper. It is important to ensure that the claims are supported by the data, and the generalizations are appropriate to the data that was presented.

■ TOPIC REVIEW

1. What is the primary purpose of the Discussion portion of the report?
2. The Discussion section should begin with a reference to what?
3. Is it usually important to cite specific statistics when discussing research results in the Discussion section?
4. True or false: Discussion is the section of the report where the researcher compares and contrasts the results with studies that were reported in the literature review.
5. When discussing limitations, it is appropriate to indicate how the limitations might affect what?
6. If a Discussion section is long, researchers sometimes include what?

■ DISCUSSION QUESTION

1. Suppose a researcher only stated "More research is needed" in a discussion of future directions for research. How might they improve upon this statement?

■ RESEARCH PLANNING

In the Discussion section of your research report, do you plan to include all the elements discussed in this topic? Start with the generic outline provided at the end of the topic, and add the names of the specific items you will discuss in this section.

■ NOTE

1. In some research journals, this part is called "Conclusions." Other variations, such as "Discussion and Conclusions," may be found.