

## 11.2. Steps in Phase B, Gathering and Summarizing the Data.

- B.1. Pilot Study
- B.2 Gathering the Data
- B.3 Summarizing the Data

Generally the researcher will first do a pilot study to test research instruments, basic research design and other assumptions. After any necessary adjustments, then the data collection begins, using all of the elements of the design. As the data is gathered it is often summarized. The summary can include graphical demonstrations, means, standard deviations, proportions or more advanced measurements such as correlations. Generally the researcher will explore many different summaries before settling on those that most clearly summarize the data.

### 11.3. Steps in Phase C, Analysis and Conclusions.

- C.1. Statistical Analysis
- C.2 Conclusions
- C.3 Limitations
- C.4 Future Research

The **statistical analysis** is designed to help the researcher form **conclusions**, along with an estimate of how likely the conclusions are to be true. The analysis of data will be covered in later lectures.

In this phase the researcher selects the most effective ways of summarizing the data. Note, however, that the original research plan will almost certainly have in mind applying particular statistical techniques to analyze the data.

One of the basic steps in a research project is to focus your research on a well-defined question, with a limited and well-defined population. While these steps often constitute good methodology, they also limit the scope of your project. In the course of gathering and analyzing the data the researcher may discover other, unplanned limitations of the study that become part of the research record. Limitations, of course, whether planned or unplanned are opportunities for future research!



**"It's my fervent hope, Fernbaugh,  
that these are meaningless statistics."**

## 11.4. Steps in Phase D, Reporting the Results.

The **research report** is an organized recapitulation, in narrative form, of the research project. Many professional organizations have particularized formats for the research report. The elements discussed in this section are generic for the purposes of this course and are intended as an exemplar rather than as definitive.

- D.1. The Title
- D.2. The Abstract
- D.3. Introduction
- D.4. Research Objectives
- D.5. Methods
- D.6. Descriptive Statistics
- D.7. Analysis
- D.8. Conclusions
- D.9. Discussion
- D.10. Appendices
- D.11. References



### **D.1. Title.**

Your research project should have a title that is short, descriptive and captures the reader's attention.

### **D.2. Abstract.**

Your abstract should generally be limited to 200 words (approximately one double-spaced typed page). It should outline your research objectives, methods and conclusions. Bear in mind that many readers will only look at your abstract.

### D.3. Introduction.

This section gives the background for your research and should include

- *a summary of past results;*
- *provide a context for the research (why should anyone care about your topic?);*
- *define the fundamental concepts you will use;*
- *define the variables;*
- *define the population;*
- *define the sample.*

## D.4. Research Objectives.

This section lists the research objectives. These are listed as conjectures or hypotheses with the intent of developing evidence to determine whether or not the conjecture is supported by objective data.

The purpose of a research project is never to "prove" or "disprove" a hypothesis. Objectives phrased in that way show that the researcher is biased toward one outcome or another.

## D.5. Methods.

This section describes

- *strategy for sample selection;*
- *research protocols (how the researcher interacted with the subject);*
- *how the variables were measured;*

## D.6. Descriptive Statistics.

This section includes summaries of the data, including for example

- *histograms*
- *pie charts*
- *scatter plots*
- *means*
- *proportions*
- *standard deviations*
- *correlation coefficients*

or whatever else makes the data easier to visualize and understand.

## D.7. Analysis.

The statistical analysis is discussed in this section. The specifics of statistical testing and analysis will be covered in subsequent lectures.



## D.8. Conclusions.

The main conclusions are often determined by the results of the statistical tests and so the "analysis" and "conclusions" sections are sometimes conflated.



## D.9. Discussion.

This section should recapitulate the context, assumptions, hypotheses, methods and conclusions of the study. This section should also discuss limitations to the research and possibilities for future research.

## D.10. Appendices.

It is unusual for a published research paper to include the complete research instruments or all of the data that was studied. Indeed, subject confidentiality may require destroying or protecting some of the data. However representative examples from the instruments and data are sometimes included in an appendix.



## D.11. References.

The bibliography should include only those items actually cited in the study. The researcher should, of course, cite any reference that is used directly or indirectly in implementing the project or reaching conclusions. References should follow the style appropriate to the discipline, such as the APA style. Most journals and professional societies have specific style manuals authors are expected to use.

When in doubt about references, a librarian is always reliable source of information.