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Method: Sample Selection, Study Design, Data Collection Procedures, and Materials

When testing the depth of a stream, do not use both feet.
– Chinese Proverb

The Overall Method

The Method section of any research study represents its heart and soul. Above all else, it basically answers the core questions what happened to whom, how, and why. Researchers place great emphasis on detailing their methods, and for good reason. First, others may wish to replicate the study to enhance its generalizability. Second, attention to methodological detail demonstrates the authors' thinking, assumptions, scientific rigor, and the realities and obstacles to conducting the actual study. Third, others may wish to use particular aspects of the Method in their own studies (e.g., a sampling technique, a procedure, a scale or instrument, interview schedule).

The Method normally includes four main areas: Sample Selection, Study Design, Data Collection Procedures, and Materials. Authors typically use two of these methodological subheadings or versions of them in their published research reports. Each of these, then, will be scrutinized, and criteria for critiquing them will be outlined.

Sample Selection

In this subsection, sometimes called Participants, Subjects, The Sample, Sampling, or The Sample and Population, the authors specify how the sample was selected. Minimally included in such specification are the size of the sample, techniques used in selecting it, its relationship

to the population, the time it took to obtain the sample, and any unique features of it. These are elaborated upon and presented as critiquing criteria in Figure 12.

Figure 12. Critiquing the Sample Selection

Elements of the Sample	Comments
1. Size	Statisticians define a large sample as $n > 250$, and a small sample as $n < 30$.
2. Techniques Used in Selection	First, is there a technique mentioned (e.g., how did the authors obtain the sample for this study)? Second, do they label the technique procedurally (e.g., random sampling, random assignment to condition, cluster sampling, snowball sampling, convenience sampling, quota sampling)?
3. Relationship to the Population	Do the authors specify the sample's (n 's) relationship to the population (N)? Example: its size vis-a-vis the N 's size, its N generalizability, its biasness, etc.
4. Time Frame for Selection	How long did it take to obtain the sample?
5. Other Unique Features	Does the sample present any unique features (e.g., its cultural context, its relationship to treatment samples, difficulties in obtaining it, specific characteristics)?

As indicated in Figure 12, in order to critique the sample, one has to check off the criteria list in Box 11.

BOX 11: Assessing the Sample Selection

Critique the sample selection with respect to

- ✓ its size
- ✓ techniques used in selection
- ✓ its relationship to the population
- ✓ its time frame
- ✓ other unique features

Study Design

At this point, the authors must articulate how the study was designed. Many authors use accepted designs (e.g., descriptive, quantitative-descriptive, experimental, or quasi-experimental). It is helpful when critiquing study designs that you eventually learn how to schematically draw or map out the design in an effort to critique it more clearly. These symbols will be explained in more detail in the forthcoming design parameters subsection. For the most part, these symbols are idiosyncratic to different professions.

Figure 13 describes the set of criteria which may be used to critique the first set, study design elements.

Figure 13. Critiquing the First Set of Study Design Elements

Design Elements	Comments
1. Time	How long did it take to complete this study?
2. Groups	How many groups or subgroups were used in the study design?
3. Replicability	Can this design be replicated?
4. Internal or External Threats	Are there any internal or external threats in this study as designed? These may include issues such as history, maturation, selection, testing, experimenter expectancy, generalizability, etc.

Corresponding Box 12 provides a summary of these criteria.

BOX 12: Critiquing the First Set of Study Design Elements

Examine the study design with respect to

- ✓ time
- ✓ groups used
- ✓ replicability
- ✓ internal or external threats

Major Classification Type

All empirical studies seek the acquisition of knowledge as their overarching purpose. Quantitative studies can conceptually be classified as one of four main types: descriptive, quantitative-descriptive, experimental, or quasi-experimental. For those familiar with the history of such classification types (see, for example, Tripodi, Fellin, & Meyer, 1983, or Grinnell Jr., 1995), you will note that social scientists have moved beyond the debate of including exploratory as one of these main types. The short story here is really rather simple--all empirical research by its very nature is exploratory. Indeed, exploration is tied to the very definition of research (see Chapter 2). As a result, it is a dated and redundant design typology as it underpins all of these other classification types. Later on, you will see how this exploratory notion is retained in quantitative studies.



In order to classify the study as such, the reader needs to pull back a bit from the Method section and examine in retrospect the overall purpose of the study. This requires one to read and probably reread the entire study, carefully appraising its central purpose and methods used together in the investigation.

Table 2 can be used to complete this task, as it provides definitions for these four major types of quantitative social research.

Table 2. Four Major Classification Types of Quantitative Social Research

Type	Purpose
1. Descriptive	To describe a phenomenon for some purpose (e.g., to delineate features of it, to develop hypotheses or questions, to modify our thinking of it, or to add to our knowledge of the phenomenon).
2. Quantitative-Descriptive	To describe and quantify variables and relate them to each other. For example, what variables impact on others and why?
3. Experimental	Their explicit purpose is to test the relationship between independent (treatment) and dependent (outcome) variables. In order to be classified as a true experimental study, all of the following criteria must be present: (1) randomization, (2) a manipulated treatment condition (X), (3) a comparison or control group who does not receive any treatment condition, and (4) specification of hypotheses.
4. Quasi-Experimental	Having the same purpose as experimental, quasi-experimental studies require some, but not all, of the criteria in 3 (above) to be present; thus they "approximate" experimental studies.

Box 13, then, provides a checklist for determining the type of quantitative research study you are critiquing. Remember that some studies may overlap these types (e.g., descriptive and quantitative-descriptive), but upon developing critical appraisal skills, one of these overriding classification types is prominent and can be determined.

BOX 13: Determining the Study Type

Is the research

- ✓ Descriptive
- ✓ Quantitative-Descriptive
- ✓ Experimental
- ✓ Quasi-Experimental

Design Objectives

After determining which of the major designs your study follows, you should then assess its design objective. That is, what is the overall design of this study actually trying to achieve? Figure 14 outlines the four main objectives of quantitative research studies.

Figure 14: Design Objectives of Quantitative Research Studies

Objectives	Comments
1. Exploration	To explore in-depth a phenomenon, event, population, intervention, interaction, culture, etc., in order to acquire more knowledge about it.
2. Instrument/Development Scale	To develop an instrument, scale, inventory, interview schedule, assessment tool, or way of measuring a phenomenon and test its utility for use by others.
3. Variable Relationships	To test the relationships between variables for determining how they impact, associate, predict, or influence each other.
4. Evaluation Research	To assess the impact of a specific program or intervention on individuals by determining its activities and outcomes. These can be evaluations of practice or evaluations of programs.

Corresponding Box 14 summarizes these main design objectives of quantitative studies.

BOX 14: Assessing the Design Objectives

What is the main objective of this study design?

- ✓ Exploratory
- ✓ Instrument/Scale Development
- ✓ Variable Relationship
- ✓ Evaluation of Practice and/or Programs

Design Parameters

Each study is designed in a way so that the researchers may optimally collect data about the phenomena being studied. How they collect their data is usually determined by resources, time, convenience, opportunity or fate, and/or how they mapped out or planned their study design. The study plan is the researcher's "road map," which helps to systematize all data collection. This ensures both the consistency of data collection and scientific integrity of the study. In turn, this enhances the generalizability of the Method part of the overall study.

Before describing the design parameters, it is important to acquaint yourself with some of the basic symbols or nomenclature used in mapping out the study plan or schema. D. Campbell and J. Stanley formally introduced these to social science researchers in 1963 in their watershed text *Experimental and Quasi-Experimental Designs for Research*.

Table 3 describes some of the more familiar symbols used in mapping out the design parameters.

Table 3. Typical Symbols Used in Mapping the Design Parameters

Main Symbols Used	Description/Comments
1. O	The "Observation" of a phenomenon. In social research this observation is usually by use of a questionnaire, survey, interview, observation schedule, shared experience, or a secondary data source (e.g. assessment forms, census). The O is really how and where the researcher collected the data and/or observed the phenomena. A subscripted O (O ₁ , O ₂ , O ₃ , etc.) means these were multiple observations of the phenomena and therefore, multiple data collection points.
2. X	Capital letter X is the main treatment effect or intervention given to the sample in the study. This is almost always a planned or contrived intervention that should be defined in precise research ways. This means it should minimally have a time frame in which it was given, goals and objectives, activities, and expected outcomes. Like O, it may be offered once or repeatedly (e.g., X ₁ , X ₂ , X ₃).
3. R	Capital letter R is the symbol for "Randomness." It is typically used in two ways. One is "Random" selection of a sample, meaning some form of random selection procedure was used in obtaining the sample. It may also mean "Randomization," in that the sample was randomly assigned to a certain treatment condition or particular group (e.g., a comparison/control group, for study purposes).
4. - - - -	These broken lines indicate that there is more than one group in the study (see Box 12). For instance, in Campbell and Stanley's Static-Group Comparison Design (1963), one group received an intervention, while the other did not. This is schematically represented as X O - - - - O

Now that you have an understanding of some of these basic symbols, you should try to map out the design parameters. Figure 15 identifies the four basic and main design parameters used in social research studies.