Learning Objectives

Upon completion of this unit, students should be able to:

1. Compare and contrast three types of experimental designs.
2. Describe threats to internal and external validity and how they can be reduced.
3. Discuss techniques for controlling extraneous variables.
4. Describe the different types of quasi-experimental designs.
5. Explain why developmental research can be difficult.
6. Compare and contrast longitudinal research and cross-sectional research.
7. Compose a research proposal with APA formatting.

Written Lecture

In this unit, the readings focus on experimental research design of pre-experimental and true experimental. Chapter 11 covers experimental designs, randomization and the role of chance in such designs. In addition, you will be introduced to internal and external threats to validity as they pertain to interpretation and generalizability of study results.

In order to distinguish between experimental designs, we must first distinguish the extent of randomness of the sample population. To ensure randomness, you must first select the participants randomly and then randomly divide the participants into groups. Once this process is complete then you can decide which group is the control group and which would receive the treatment.

There are two types of experimental designs: pre-experimental and true experimental. In both, the researcher “controls” or “manipulates” the independent variable and observes the effect on a dependent variable. We can compare pre-experimental designs with true experimental designs and quasi-experimental designs.

Consider the information in Table 11.1 page 227 of the textbook. From this you can see that the pre-experimental design uses the lowest amount of randomness. In the pre-experimental design, the control group is not used and participants are not random. Because of the absences of these two attributes, it is difficult to establish causation between the dependent and independent variables. Cause and effect is more likely to be established using a true experimental design.

This design uses a control group and a completely random sample. These are major strengths of the true experimental design. The overall advantage of the experimental approach is that it permits a cause and effect analysis to be conducted with clarity and precision. It is more accurate and dependable information. However, the experimental method cannot always be used and sometimes manipulations of the variables are impossible.
Each design can be evaluated on the scales of validity. Validity measures how effective the design is at doing what it is supposed to do. Internal validity measures how the independent variable can be compromised. Threats to internal validity include history, maturation, selection, testing, instrumentation, regression, and mortality. External validity, which is focused on the applicability of the results, can be threatened by multiple treatment interference, reactive arrangements, experimenter effects, and pretest sensitization.

In Chapter 12, you will study the quasi-experimental research design. Here, the researcher observes some phenomenon after-the-fact. The researcher studies some type of phenomenon that was not manipulated and examines the relationship among two or more variables. While not as powerful as a true experimental design, quasi-experimental designs are often used in social science research when random assignment to groups is not a viable option. Designs, such as nonequivalent groups, single-subject, and multiple baselines, are discussed. In addition, students are also introduced to developmental research techniques that utilize longitudinal and cross-sectional methods.