

Chapter 1: Introduction to Social Science Research

I. Populations and Samples

- a. A population includes every member of a category, such as all adults in the United States or every student in a school.
 - i. Populations do not have to be large, just inclusive.
 - ii. Any value (e.g., mean, standard deviation, etc.) that is generated from or applied to a population is called a parameter.
- b. A sample is a subset of a population. For example, if I want to know the average weight of students in a school, and I weigh some of the students, but not all, the students that I weighed are my sample.
 - i. Any value that is generated from sample data is called a statistic.

II. Inferential and Descriptive Statistics

- a. Statistics that are calculated with sample data for the purpose of reaching some conclusion about the population the sample is supposed to represent are called inferential statistics.
- b. When the researcher simply wants to describe the characteristics of a sample or a population, such as the mean, but does not want to use these statistics to make inferences about the population, these are called descriptive statistics.
- c. A key goal of inferential statistics is to be able to generalize the results obtained from sample data to some population, or populations, that the sample or samples represent.

III. Sampling Methods

- a. Random sampling: Every member of the population has an equal chance of being selected for the sample.
- b. Representative sampling: The researcher purposely selects that sample so that it represents the population on one or more important characteristics.
- c. Convenience sampling: The researcher selects the sample out of convenience without regard to how well the sample represents the population.
- d. The way a sample is selected influences how well the sample represents the population, and whether the results found in the sample will generalize to the larger population. Generally speaking, random and representative sampling methods increase the likelihood of the sample results generalizing to the population.

IV. Variables and Scales of Measurement

- a. Any construct that has more than one value can be a variable.
- b. There are different types of variables.

- i. Categorical (sometimes called qualitative or nominal): A variable with independent categories, such as gender or grade level.
 - ii. Ordinal: A variable for which the numbers are meaningful, but the intervals between the numbers are not equal, such as the place of finishing in a race.
 - iii. Interval/ratio: A variable for which the numbers are meaningful and the intervals between the numbers are equal, such as weights on a scale, hours, inches, etc.
- c. There is also a distinction between independent and dependent variables.
 - i. Dependent: The values of this variable are presumed to depend on the values of another variable.
 - ii. Independent: The values of the dependent variable are presumed to depend on the value of the independent variable.
 - 1. e.g., Energy level (dependent variable) can depend on how much sugar one eats (independent variable).

V. Research designs

- a. There are different types of research that employ different research designs.
- b. Experimental: The researcher manipulates an independent variable to determine whether it influences the dependent variable.
 - i. Randomized control trial (RCT) is becoming increasingly common in social science research. It involves random assignment or selection of individual cases to groups and providing a treatment, or intervention for one or more groups while treating the other group as a control.
- c. Quasi-experimental: The researcher manipulates an independent variable to determine whether it influences the dependent variable, but in a naturally occurring situation rather than a controlled laboratory setting.
- d. Correlational: The researcher does not manipulate independent variables but measures two or more variables to see how they are associated with each other.

VI. Graphs

- a. Data are often represented pictorially, in graphs.
- b. The purpose of the graph is to summarize the information about a distribution in a manner that is clear and easy to comprehend.
- c. There are several ways to graphically represent data. Some of the most common are line graphs, column graphs, stacked column graphs, and pie charts.
- d. It is important to pay close attention to the scale on the Y-axis of graphs as they can sometimes be misleading.

VII. Summary

- a. The statistics that are calculated and interpreted are part of a larger research process.

- b. Every aspect of the research process, from how the samples were selected to how the variables were defined and measured to the research design and how the data are presented in graphs affect the statistics that are generated by the research and how those statistics are interpreted.
- c. It is important for you to understand the entire research process. Otherwise, it is difficult to really understand what the statistics mean, or how trustworthy they are.