SOCI 326
Quantitative Methods in Social Research

Session 1 – Basic Concepts

Lecturer: Dr. Rabiu Kwaku Boakye Asante, Sociology Department
Contact Information: rkbasante@ug.edu.gh
This session aims at introducing students to a list of key concepts fundamental to the understanding of the link between theory and data. The purpose is to set the stage for students to appreciate the essence of quantitative methods as an integral part of the research process from Soci 325.
The key concepts to be covered will include the following:

- Variables
- Levels of measurements
- Population
- Parameter
- Sample
- Statistic
- Descriptive Statistics
- Inferential Statistics
Topic One

BASIC CONCEPTS
Basic Concepts

This section will take us down the memory lane of last semester. The following concepts are not entirely new to us but we need to revisit them because they are the foundation of this course. What do these concepts mean?

• Variables
• Levels of measurement
• Population
• Sample
• Statistics
• Parameter
Topic Two

VARIABLES
• A **variable** is a characteristic or condition that can change or take on different values e.g. age, gender, marital status, level,
• Most research begins with a general question about the relationship between two variables for a specific group of individuals
Topic Three

MEASUREMENT OF VARIABLES
Measuring Variables

• To establish relationships between variables, researchers must observe the variables and record their observations. This requires that the variables be measured.

• The process of measuring a variable requires a set of categories called a **scale of measurement** and a process that classifies each individual into one category.
Measurement Scales

1. A **nominal scale** is an unordered set of categories identified only by name. Nominal measurements only permit you to determine whether two individuals are the same or different.

1. An **ordinal scale** is an ordered set of categories. Ordinal measurements tell you the direction of difference between two individuals.
3. An **interval scale** is an ordered series of equal-sized categories. Interval measurements identify the direction and magnitude of a difference. The zero point is located arbitrarily on an interval scale.

4. A **ratio scale** is an interval scale where a value of zero indicates none of the variable. Ratio measurements identify the direction and magnitude of differences and allow ratio comparisons of measurements.
Topic Four

POPULATION
Population

• The total **set of units** exposed to a particular social occurrence being studied called the **population**.

• These **set of units** can individuals, groups, institutions, organizations, countries

• For example, a researcher may be interested in the relation between class size (variable 1) and academic performance (variable 2) among sociology students at the University of Ghana. The Population = all sociology students at the University of Ghana
Topic Five

SAMPLE
Sample

• A selected few chosen from the population in order to draw conclusions about the population.
• It is often large enough to represent the population and small enough to possess all the major defining features of the population.
• Usually populations are so large that a researcher cannot examine the entire group.
• Therefore, a **sample** is selected to represent the population in a research study.
• The goal is to use the results obtained from the sample to help answer questions about the population.
Topic Six

RELATIONSHIP BETWEEN A POPULATION AND A SAMPLE
Population:
All individuals of interest

Sample:
A selected few from the population

Sample observation are generalized to the population

Observation of individual units in the sample
Topic Six

DESCRIPTIVE AND INFERENTIAL STATISTICS
Descriptive Statistics

• **Descriptive statistics** are methods for organizing and summarizing data

• For example, tables or graphs are used to organize data, and descriptive values such as the average score are used to summarize data

• A descriptive value for a population is called a **parameter** and a descriptive value for a sample is called a **statistic**.
Focus of Quantitative Methods

Population

Parameter

Focus of Quantitative study

Sample

Descriptive statistic

Statistic (sample mean, sample proportion)

Inferential statistics ($U, Pu$)
Inferential Statistics

- **Inferential statistics** are methods for using sample data to make general conclusions (inferences) about populations.

- Because a sample is typically only a part of the whole population, sample data provides only limited information about the population.
Sample Question

• What is the difference between a sample and a population?
• Explain the following concepts: parameter, statistics, descriptive statistics and inferential statistics
References