# 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

## UNIVERSITY OF GHANA

College of Education
**School of Continuing and Distance Education**
2014/2015 – 2016/2017

# Session Overview

- 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.

UNIVERSITY OF GHANA

# Session Outline

- The key concepts to be covered will include the following:
    - Variables
    - Levels of measurements
    - Population
    - Parameter
    - Sample
    - Statistic
    - Descriptive Statistics
    - Inferential Statistics

UNIVERSITY OF GHANA

# Reading List

- Healey, J. F. (2010). *Statistics: A Tool for Social Research.* Wadsworth: CA, pg 1- 17

UNIVERSITY OF GHANA

# Topic One
## BASIC CONCEPTS

UNIVERSITY OF GHANA

# 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

UNIVERSITY OF GHANA

# Topic Two
## VARIABLES

UNIVERSITY OF GHANA

# 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

8

UNIVERSITY OF GHANA

# Topic Three
## MEASUREMENT OF VARIABLES

UNIVERSITY OF GHANA

# 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.

UNIVERSITY OF GHANA

# 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.

UNIVERSITY OF GHANA

# Measurement Scales Continuation

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.

UNIVERSITY OF GHANA

# 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

UNIVERSITY OF GHANA

# Topic Five

**SAMPLE**

UNIVERSITY OF GHANA

# 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 posses 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.

UNIVERSITY OF GHANA

# Topic Six

# RELATIONSHIP BETWEEN A POPULATION AND A SAMPLE

UNIVERSITY OF GHANA

Population:
All individuals of interest

Sample
A selected few from the population

Observation of individual units in the sample

Sample observation are generalized to the population

UNIVERSITY OF GHANA

# Topic Six

# DESCRIPTIVE AND INFERENTIAL STATISTICS

UNIVERSITY OF GHANA
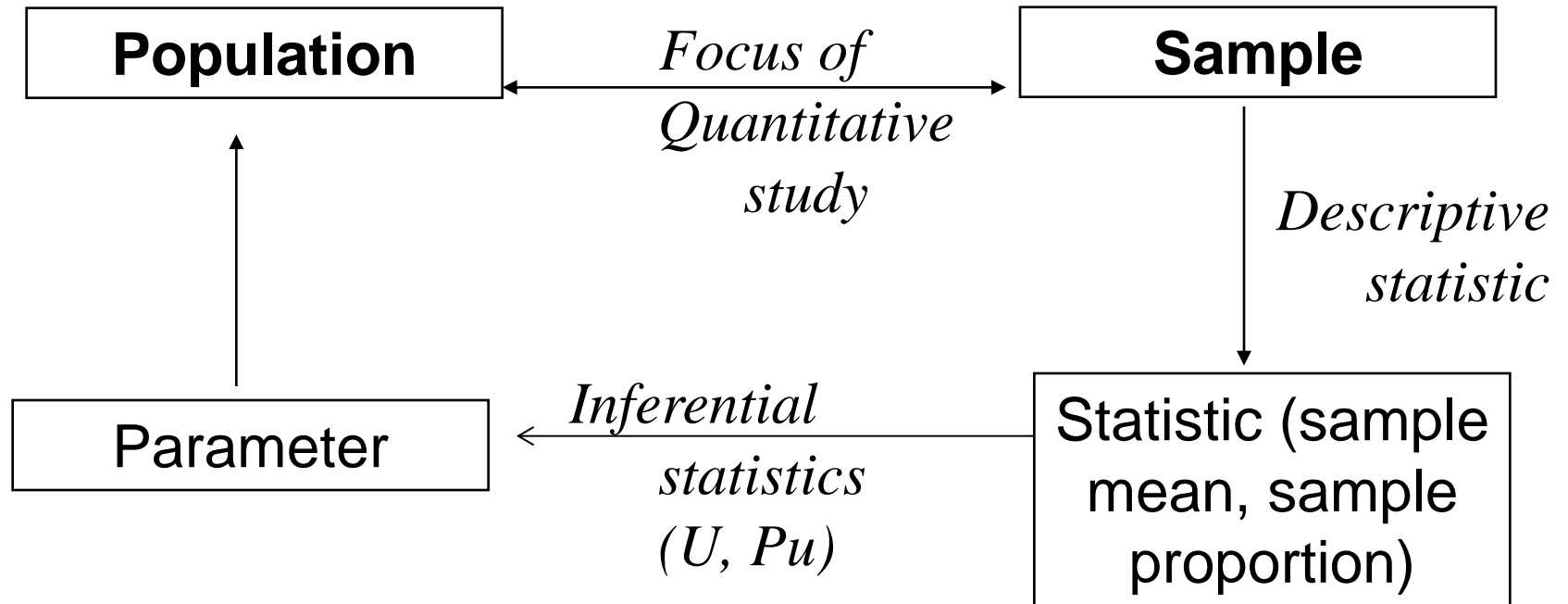
# Descriptive Statistics

- **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**.

UNIVERSITY OF GHANA

**Population** ←— *Focus of Quantitative study* —→ **Sample**

Statistic (sample mean, sample proportion)

*Descriptive statistic*

*Inferential statistics (U, Pu)*

Parameter

21

UNIVERSITY OF GHANA

# 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

UNIVERSITY OF GHANA

# Sample Question

- What is the difference between a sample and a population?

- Explain the following concepts: parameter, statistics, descriptive statistics and inferential statistics

UNIVERSITY OF GHANA

# References

- Healey, J. F. (2010). ***Statistics: A Tool for Social Research.*** Wadsworth: CA

UNIVERSITY OF GHANA