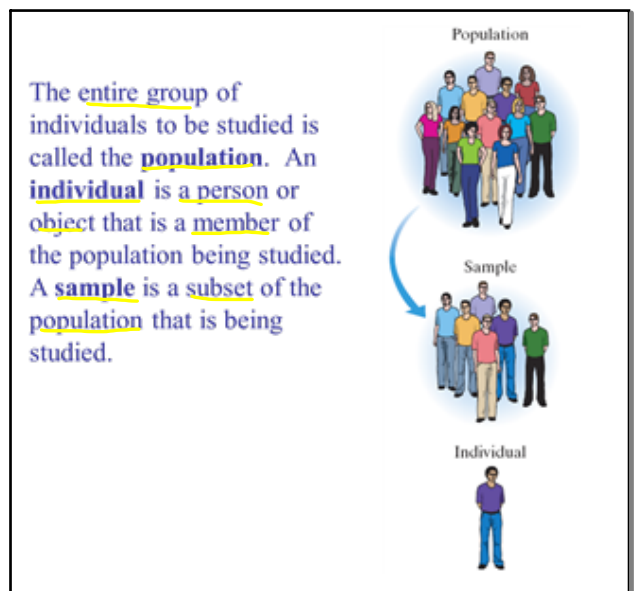


Section 1.1

Introduction to the Objectives Practice of Statistics

1. Define statistics and statistical thinking
2. Explain the process of statistics
3. Distinguish between qualitative and quantitative variables
4. Distinguish between discrete and continuous variables
5. Determine the level of measurement of a variable

Statistics is the science of collecting, organizing, summarizing, and analyzing information to draw conclusions or answer questions. In addition, statistics is about providing a measure of confidence in any conclusions.



Descriptive statistics consist of organizing and summarizing data. Descriptive statistics describe data through numerical summaries, tables, and graphs. A **statistic** is a numerical summary based on a sample.

Inferential statistics uses methods that take results from a sample, extends them to the population, and measures the reliability of the result.

A **parameter** is a numerical summary of a population.

EXAMPLE *Parameter versus Statistic*

Suppose the percentage of all students on your campus who have a job is 84.9%.

Parameter

Suppose a sample of 250 students is obtained, and from this sample we find that 86.4% have a job.

Statistic

The Process of Statistics

Step 1: Identify the research objective.

Question

Step 2: Collect the information needed to answer the question.

Step 3: Describe the data - Organize and summarize the information.

Step 4: Draw conclusions from the data.

Variables are the characteristics of the individuals within the population.

As researchers, we wish to identify the factors that influence variability.

Qualitative or Categorical variables allow for classification of individuals based on some attribute or characteristic.

*Male, Female:
Blond, Red, Black...
Fiction, Non-Fiction...*

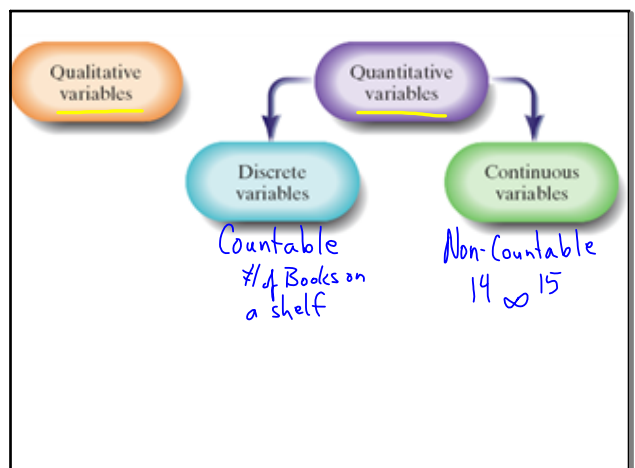
Quantitative variables provide numerical measures of individuals. The values of a quantitative variable can be added or subtracted and provide meaningful results.

*# of Pets
of Children*

EXAMPLE *Distinguishing between Qualitative and Quantitative Variables*

Classify each of the following variables considered in the study as qualitative or quantitative.

- a. Nationality *Qual.*
- b. Number of children *Quan.*
- c. Household income in the previous year *Quan.*
- d. Level of education *Qual.*
- e. Daily intake of whole grains (measured in grams per day) *Quan.*



EXAMPLE *Distinguishing between Discrete and Continuous Variables*

Classify each of the following quantitative variables considered in the study as discrete or continuous.

- a. Number of children *Discrete*
- b. Household income in the previous year *Cont.*
- c. Daily intake of whole grains (measured in grams per day)
Cont.