

Chapter 9

Selecting the Sample

Learning Objectives

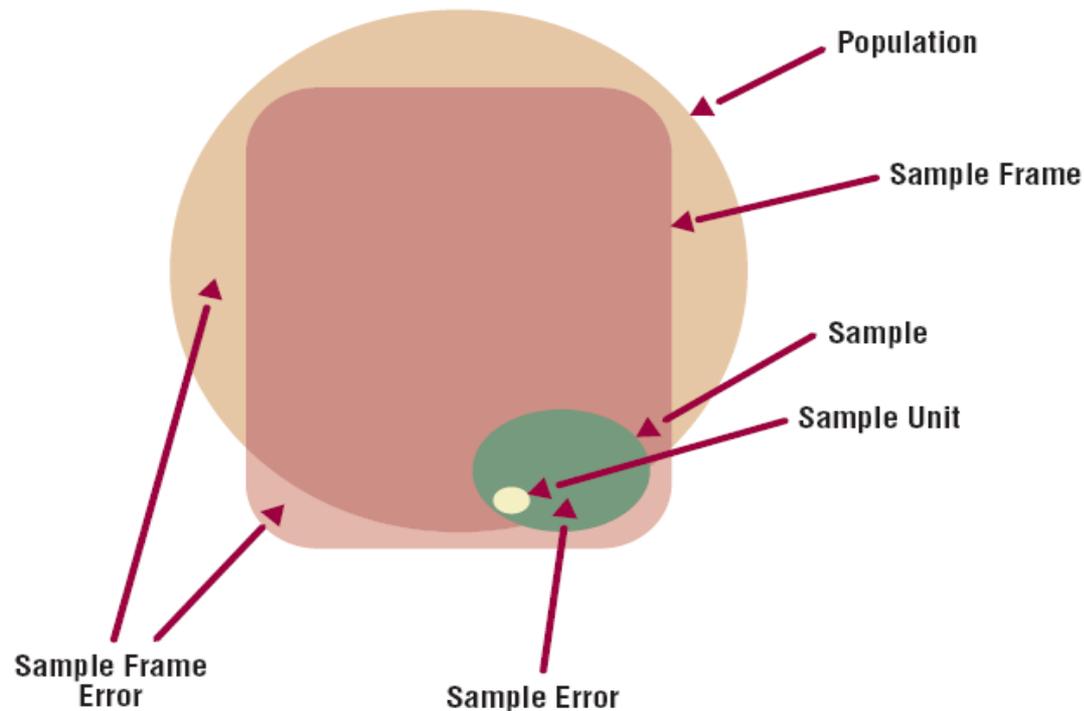
- To become familiar with sample design terminology
- To understand the differences between probability and nonprobability sampling methods
- To learn how to take four types of probability samples: simple random samples, systematic samples, cluster samples, and stratified samples
- To learn how to take four types of nonprobability samples: convenience samples, purposive samples, referral samples, and quota samples
- To acquire the skills to administer different types of samples, including online samples
- To be able to develop a sample plan

"WHERE WE ARE"

- 1 Establish the need for marketing research.
- 2 Define the problem.
- 3 Establish research objectives.
- 4 Determine research design.
- 5 Identify information types and sources.
- 6 Determine methods of accessing data.
- 7 Design data-collection forms.
- 8 Determine the sample plan and size.
- 9 Collect data.
- 10 Analyze data.
- 11 Prepare and present the final research report.

Basic Concepts in samples and Sampling

- **Population:** the entire group under study as defined by research objectives



Population



The population is the entire group under study.

Census

- A **census** is an accounting of the complete population.
- A Census requires information from everyone in the population.

Sample and sample unit

- **Sample:** a subset of the population that should represent the entire group
- **Sample unit:** the basic level of investigation

Sample frame and sample frame error

- A **sample frame**: a master list of the entire population
- **Sampling frame error**: the degree to which the sample frame fails to account for all of the population
- **Sampling error**: any error in a survey that occurs because a sample is used

TABLE 9.1 The Same Frame Can Greatly Affect the Findings of a Survey

Sample Frame	Use of the Internet	Use of Credit Cards	Price Sensitivity	Use of Online Banking	Shopping in Stores
People who purchase in stores using credit cards	Very low	Very high	Low	Very low	Very high
People who shop in stores but don't use credit cards	Very low	Very low	High	Very low	High
People who buy online and use credit cards	Very high	Very high	Moderate	Low	Moderate

Reasons for Taking a Sample

- **Why a sample is almost always more desirable than a census?** Taking a sample is less expensive than taking a census.
 - 1-Practical considerations such as cost and population size
 - 2-Inability of researcher to analyze huge amounts of data generated by census

Probability versus Nonprobability sampling

- **All sample designs fall into one of two categories;**
 - 1-Probability samples:** ones in which members of the population have a known chance (probability) of being selected into the sample
 - 2-Nonprobability samples:** instances in which the chances (probability) of selecting members from the population into the sample are unknown

First: Probability Sampling Methods

- **There are four methods;**
 - 1-Simple random sampling
 - 2-Systematic sampling
 - 3-Cluster sampling
 - 4-Stratified sampling

- 1-Simple random sampling:** the probability of being selected into the sample is “known” and equal for all members of the population.
- This probability is expressed by the following formula;

Probability of selection= Sample size/ Population size

- The **random device method** involves using an apparatus of some sort to ensure that every member of the population has the same chance of being selected into the sample.
- The “random device” is a form of simple random sampling.

- The **random numbers method** involves small populations that are easily accommodated by the physical aspects of the device.
- Go to p.245 and read the steps

- **Simple random sampling used in practice;** there are two practical application in which simple random sample designs are employed quite successfully;
- a) **Random digit dialing;** is used in telephone survey to overcome the problems of unlisted and new telephone number.
 - It may result in large number of calls to non existing telephone numbers.
- B) **Plus-one dialing;** a convenient variation of random digit dialing.
 - Plus-one dialing procedure, in which numbers are selected from a telephone directory and a digit.

- 2-Systematic sampling:** way to select a random sample from a directory or list that is much more efficient than simple random sampling.
- To use systematic sampling , it is necessary to obtain a hard-copy listing of the population.
 - The most common listing is a directory of some sort.
 - The researcher decide on a **Skip interval** which is calculated by dividing the number of names on the list by the sample size(go to p.244)

- **The efficiency in systematic sampling is gained by two features;**
 - 1- Skip interval aspect .
 - 2- The need to use random number only at the beginning.
- **Disadvantage of systematic sampling;**
 - The sample frame will not include certain population members, and these members have no chance of being selected into the sample because of this fact.

3-Cluster sampling: method in which the population is divided into subgroups, called “clusters,” each of which could represent the entire population.

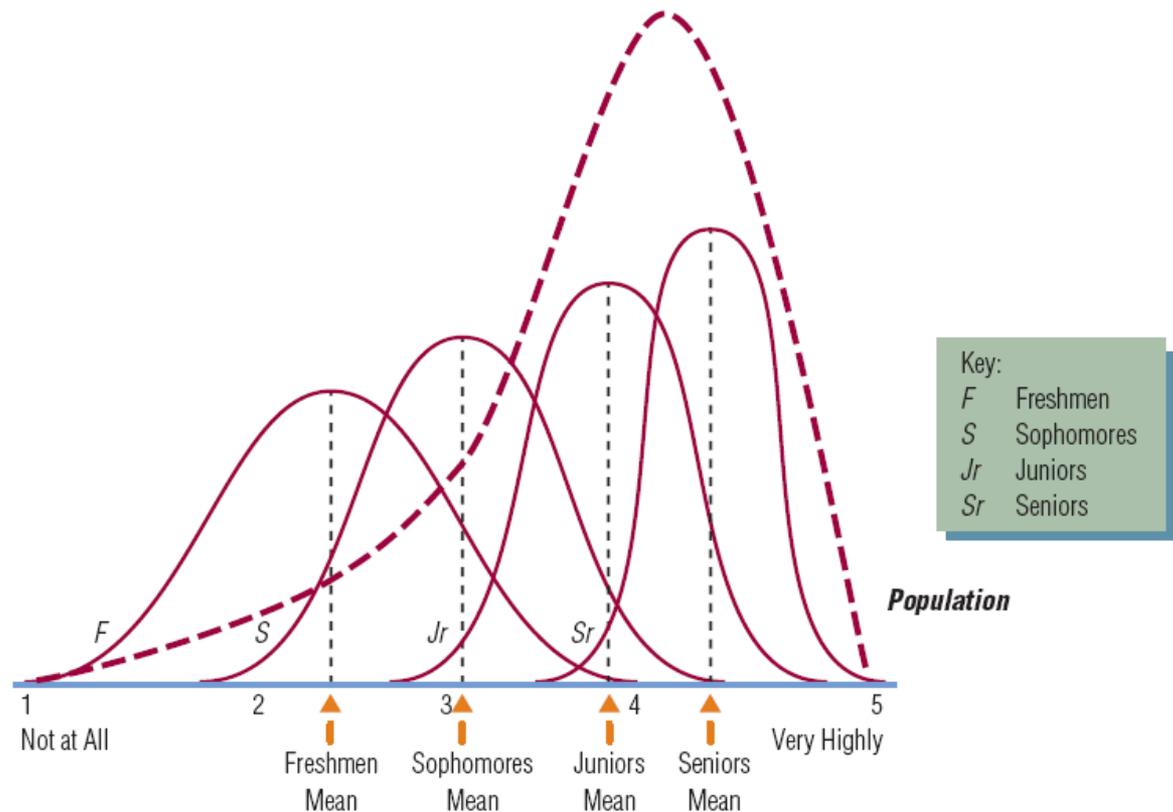
-Area sampling as a form of cluster sampling;

Area sampling is a form of **cluster sampling**; the geographic area is divided into clusters.

- **One-step area sample:** the researcher may believe the various geographic areas (clusters) to be sufficiently identical to allow concentrating his or her attention on just one area and then generalizing the results to the full population.
- **Two-step area sample:** the researcher selects a random sample of areas, and then he or she decides on a probability method to sample individuals within the chosen areas.

- **Disadvantage:** the cluster specification error occurs when the clusters are not homogeneous.

4-Stratified sampling: separates the population into different subgroups and then samples all of these subgroups.



"To what extent do you value a college degree?"

Second; Nonprobability Sampling

- With nonprobability sampling methods selection is not based on fairness, equity, or equal chance.
- **Types of nonprobability sampling ;**
 - 1-Convenience sampling
 - 2-Purposive sampling
 - 3-Referral sampling
 - 4-Quota sampling

1-Convenience samples: samples drawn at the convenience of the interviewer.

- Accordingly, the most convenience areas to researcher in terms of reduced time and effort turn out to be high-traffic areas, such as malls.
- Convenience samples may misrepresent the population.

2-Purposive samples: requires a judgment or an “educated guess” as to who should represent the population.

-Focus group used it.

3-Referral samples: require respondents to provide the names of prospective respondents.

-Such as the sample begin when the researcher compiles the names of prospective respondents that is smaller than the total sample desires for the study, after each respondent is interviewed he or she is queried about the names of other possible respondents.(Rainbow company)

4-Quota samples: Specified percentages of the total sample for various types of individuals to be interviewed.

-For example;

A researcher may desire the sample to be 50% males and 50% females.

Online Sampling Techniques

- **Three types of samples are used with online survey;**
 - 1-Online panels:** large numbers of individuals who have agreed to participate in online surveys
 - 2-River samples:** created via the use of banners, pop-ups, or other online devices that invite website visitors to take part in the survey
 - 3-E-mail list samples:** purchased or otherwise procured from someone or some company that has compiled email addresses of opt-in members of the population of interest

Developing a sample plan

- **Which the researcher goes through to draw and ultimately arrive at final sample;(Steps in sample plane)**
 - 1- Define the population.
 - 2-Obtain a sample frame.
 - 3-Decide on the sample method.
 - 4- Decide on the sample size.
 - 5- Draw the sample.
 - 6-Validate the sample; inspect some relevant characteristics of the sample to judge how well it matches the known distribution of these characteristics in the population.