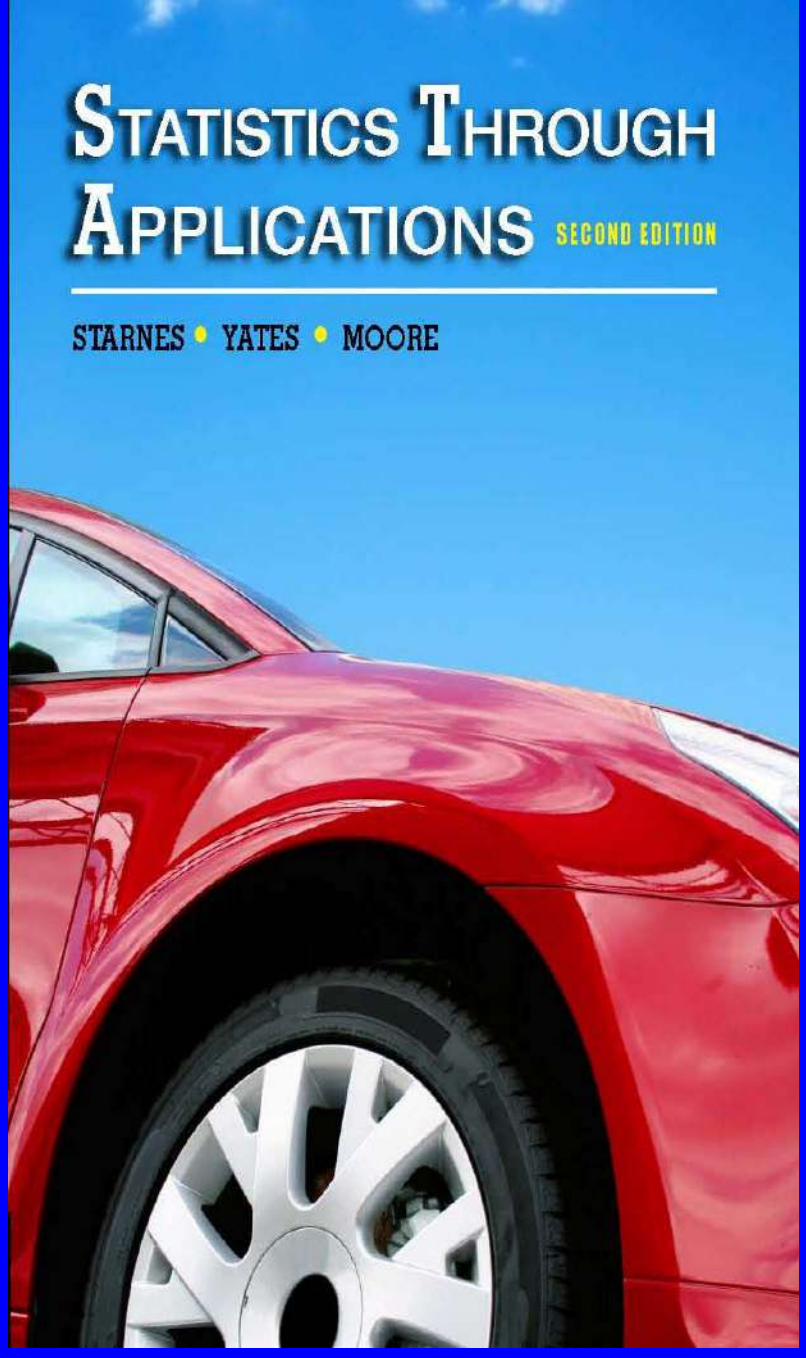


# Chapter 5

# Sampling and Surveys


"PEANUTS"
SCHROEDER, WHY DON'T YOU GIVE UP THIS CLASSICAL MUSIC THING?
DON'T YOU KNOW THERE ARE OVER EIGHTY MILLION PIANO STUDENTS IN THIS COUNTRY?
AND LESS THAN ONE PERCENT OF THEM EVER MAKE A REAL LIVING AT IT!
WHERE DID YOU GET THOSE FIGURES?
I JUST MADE THEM UP...
SCHULZ
11/30

# Section 5.3
# Sample Surveys in the Real World

Typical Pew Opinion Poll of 1000 people...

Never answered phone
938
Answered but refused
678
Not eligible: no person aged at least 18,or language barrier
221
Incomplete interview
42
Complete interview
1000

# How sample surveys go wrong

Errors in sampling

Sampling errors – caused by the act of taking a sample
Random sampling error – deviation between the sample statistic and the population parameter caused by chance in selecting a random sample (margin of error only includes this type of error)
Nonsampling errors – not related to the act of selecting a sample

## Random sampling error

Can be controlled by choosing size of sample

## Bad Samples

Voluntary response, convenient sample
These methods can be avoided

## Sampling Frame

List from which we can draw a sample, ideally every individual in the population

## Undercoverage

Occurs when some groups in the population are left out of the process of choosing the sample

Example: Using telephone directories as a frame misses everyone with an unlisted number

# Nonsampling errors

Can plague even a census

Include processing errors (mechanical task errors)
Response error (lies, incorrect answer, lack of understanding, faulty memory)
Nonresponse (person selected can't be reached or refuses to answer) - this is the most serious problem facing sample surveys!

# What the margin of error doesn't say

Announced margin of error covers only random sampling error!

# Wording Questions

Wording ALWAYS influences the answers!

Questions can be slanted to favor one response over others

This is another source of sampling error....

# Sample design in the real world

Goal: take an SRS from the population and use a statistic from your sample to estimate a population parameter

Reality: it is very difficult to actually get an SRS from the population of interest!

# Refining the process

Stratified Random Sample

Divide the sampling frame into distinct groups called strata (grade level, gender, lunch bell)

Take a separate SRS in each stratum and combine these to make up the complete sample

# Refining the process

Systematic Sample
Number each individual in the population
Choose every nth (5th, or 10th, or 23rd) person

# Refining the process

Quota Sample

Divide the population into smaller homogeneous groups based on some characteristic (gender, age, etc.)

Choose proportionally from each group to reflect the same characteristic in the population

# Good samples are probability samples

Chosen by chance
Must know what samples are possible and what chance each possible sample has

SRS, Stratified Random Samples, Systematic Samples,
and Quota Samples are all probability samples

# Before you believe a poll, ask:

Who carried out the survey?
What was the population?
How was the sample selected?
How large was the sample?
What was the response rate?
How were the subjects contacted?
When was the survey conducted?
What were the exact questions asked?