Chapter 5: Inferential Statistics

Inferential Statistics

- Population
  - (Parameter)
- Sample
  - (Statistics)

Thursday evening news…

There they are again—the most terrifying five words on television:
"According to a new study . . ."

Hypotheses

- Research
  - (Words)
- Null
  - (H_o)
- Alternative
  - (H_1)

Hypothesis Testing

- Research hypothesis of relationship
- Statistical null hypothesis
- Alternative hypothesis
- Obtain data
- Make decision based on probability

Conducting a Study of Underwear

- What is the research hypothesis?
- What is the null hypothesis?
- How would you go about making a decision?

Normal Distribution

Null and Alternative Hypotheses

- Are there any differences in water purity?
- Type I and Type II errors

Variable Classification

Null Hypothesis

Anything Happening Here?

Selected Statistical Tests

- Chi-square
- *t* test for two independent groups
- Dependent *t* test for paired groups
- One-way ANOVA

What Analysis?

Some Examples

- Chi-square
  - Gender and knee injuries in collegiate basketball players
- Independent *t* test
  - Differences in girls and boys
- Dependent *t* test
  - Pre- and postmeasurement
- One-way ANOVA
  - Return to the purity of water example

Chi-Square Example for 6 Conferences
(Based on *Sports Illustrated*, February 13, 1995)

	Women	**Men**
ACC	20	4
Big East	9	4
SEC	15	5
Big Ten	15	7
Big 8	10	1
PAC 10	14	5
Total (109)	83	26

Null Hypothesis

		Gender		
		Women	**Men**	
Injury	**No**	846	846	1692
	Yes	54	54	108
		900	900	1800

DF = 1
Chi-square = 0.00
P < 1.00

Actual Data

		Gender		
		Women	**Men**	
Injury	**No**	817	874	1691
	Yes	83	26	109
		900	900	1800

DF=1
Chi- square = 31.73
P < .0001

Independent *t* test Example

Dependent *t* test Example

SPSS Examples