

Lesson 3: Two Way Tables and Conditional Distribution

Daily Data Collection

Each student will record the following information on the board:

Gender and Preference in your free time: Reading, sports/active, TV/Video Games

Terms:

Two Way Table - (also called a contingency table) a useful tool for examining relationships between categorical variables. The entries in the cells of a two-way table can be frequency counts or relative frequencies (just like a one-way table).

Marginal Frequency - Entries in the "Total" row and "Total" column are called marginal frequencies or the marginal distribution.

Joint frequencies – Entries in the body of the table.

Class Data:

| <i>Frequency</i> | Reading | Sports | TV | Total |
|------------------|---------|--------|----|-------|
| Men | | | | |
| Women | | | | |
| Total | | | | |

| <i>Relative Frequency</i> | Reading | Sports | TV | Total |
|---------------------------|---------|--------|----|-------|
| Men | | | | |
| Women | | | | |
| Total | | | | 100% |

Analysis:

- Look only at the marginal frequencies in the Total row at the bottom. What can you conclude about the total distribution of activity?
- Look only at the marginal frequencies in the Total column at the left. What can you conclude about the total distribution of gender?
- Look only at the joint frequencies in the body. What can you conclude about the total distribution of activity and gender?

Class Data – copy down the values from the previous page to answer the questions below:

| <i>Frequency</i> | Reading | Sports | TV | Total |
|------------------|----------------|---------------|-----------|--------------|
| Men | | | | |
| Women | | | | |
| Total | | | | |

Create a bar chart for the opinions of Men:

What percent of those surveyed were Women?

What percent of those surveyed were Women and favor TV?

What percent of Men favor Sports?

What percent of those who favor Reading were Women?

Terms:

Conditional Distribution - A Conditional Distribution of a variable describes the values of that variable among individuals who have a specific value of another variable.

Segmented Bar Chart - A segmented bar chart has one bar for each level of a categorical variable. Each bar is divided into "segments", such that the length of each segment indicates proportion or percentage of observations in a second variable. This is sometimes called a stacked bar chart.

Association - We say there is an association between two variables if specific values of one variable tend to occur in common with specific values of the other. A two-way table must be a conditional distribution in order for association to be noticeable. Example: In Football, there is an association between turnovers and losing.

Class Data:

Make the two-way table below show the conditional frequencies for activity based on gender. Then make a segmented bar chart.

| | Reading | Sports | TV | Total |
|-------|---------|--------|----|-------|
| Men | | | | 100% |
| Women | | | | 100% |



Analysis: Describe the difference in distribution between men and women

Make the two-way table below show the conditional frequencies for gender based on activity. Then make a segmented bar chart.

| | Reading | Sports | TV |
|-------|---------|--------|------|
| Men | | | |
| Women | | | |
| Total | 100% | 100% | 100% |



Analysis: Describe the difference in distribution between the activities.