AP STAT Chapter 1

Conditional vs Marginal Distribution Extra Example

- Understand Marginal and Conditional distributions
  - Go to my website and watch Under “Sample Worked Out Problem Videos”
    - TPS5e_1.1_p17_Example:
      http://bcs.whfreeman.com/webpub/Ektron/TPS5e/Student%20Resources/Worked%20Example%20Videos/Worked%20Example%20Videos%20Womens%20and%20Mens%20Opinions.html

Example: Conditional distributions and relationships

We suspect that gender might influence a young adult’s opinion about the chance of getting rich. We’ll compare the conditional distributions of response for men alone and for women alone.

Based on the sample data, men seem somewhat more optimistic about their future income than women.

- Definitions made simple
  - Marginal distributions – %’s on the outside of a 2-way table. The %’s describe the characteristics of the entire sample investigating.
  - Conditional distributions – %’s on the inside of a 2-way table. The %’s allow us to investigate the association between the 2 variable.
    - Use the variable that explains the other variable
    - If the conditional %’s are the same then there is “NO” association between the 2 variables.

- In-Class -
  - Watch video
    - \Documents\AP Stats 2017-18\AP Chapter Work\c4TPS Chapter 1 & Summer Assignment\2017 Week 1 Class materials
    - PD Video 1.1 - Start at 4.02 for marginal and conditional distributions
  - Do Extra Example (on back)
Conditional vs Marginal Distribution Extra Example

11. Commuting to work The table shows how a company’s employees commute to work.

<table>
<thead>
<tr>
<th>Job Class</th>
<th>Transportation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Car</td>
</tr>
<tr>
<td>Management</td>
<td>26</td>
</tr>
<tr>
<td>Labor</td>
<td>56</td>
</tr>
<tr>
<td>Total</td>
<td>82</td>
</tr>
</tbody>
</table>

a. What is the marginal distribution (in %) of mode of transportation?

- Car: 20%
- Bus: 30%
- Train: 50%

b. What is the conditional distribution (in %) of mode of transportation for management?

- Car: 29%
- Bus: 22%
- Train: 49%

17. The two-way table below shows the relationship between means of transportation to work and gender for a simple random sample of 250 working adults in the United States.

<table>
<thead>
<tr>
<th></th>
<th>Drive alone</th>
<th>Car Pool</th>
<th>Public transportation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>113 (84%)</td>
<td>16 (12%)</td>
<td>6 (4%)</td>
</tr>
<tr>
<td>Female</td>
<td>85 (74%)</td>
<td>23 (20%)</td>
<td>7 (6%)</td>
</tr>
</tbody>
</table>

Discuss the relationship between gender and means of transportation to work for the working adults in this sample. Provide appropriate marginal and conditional distributions to support your answer. 1) Create table with appropriate %'s 2) Provide an appropriate graph.

3) Explain relationship.

Conclusions

1) There is an association between gender and means of transportation
2) Females prefer Car pools and public transportation
3) Males prefer to drive alone.