KEY

AP STAT Chapter 1

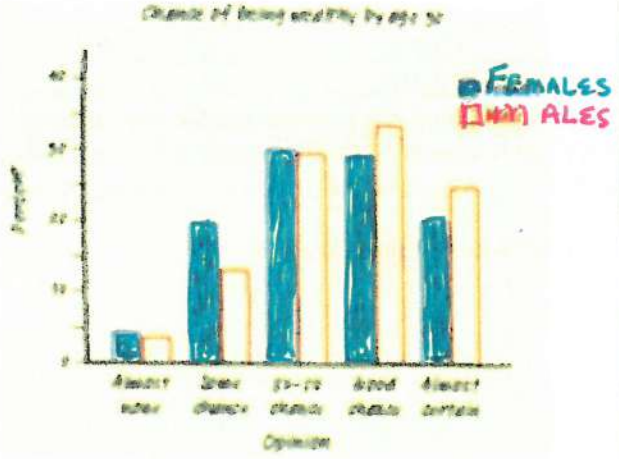
Conditional vs Marginal Distribution Extra Example

- **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

Response	Female	Male
Almost no chance	4.1%	4.3%
Some chance	18.9%	11.8%
A 50-50 chance	29.4%	26.3%
A good chance	28.0%	32.4%
Almost certain	20.5%	24.3%



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\e4TPS 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)

KEY

Conditional vs Marginal Distribution Extra Example

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

Job Class	Transportation: Car	Bus	Train	Total
Management	26	20	44	90
Labor	56	106	168	330
Total	82	126	212	420

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

Car 20% Bus 30% Train 50%

82/420 = .1952 = 20%
126/420 = .3 = 30%
212/420 = .5047 = 50%

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

Car 29% Bus 22% Train 49%

26/90 20/90 44/90
.289 .222 .489

% should add to 100%

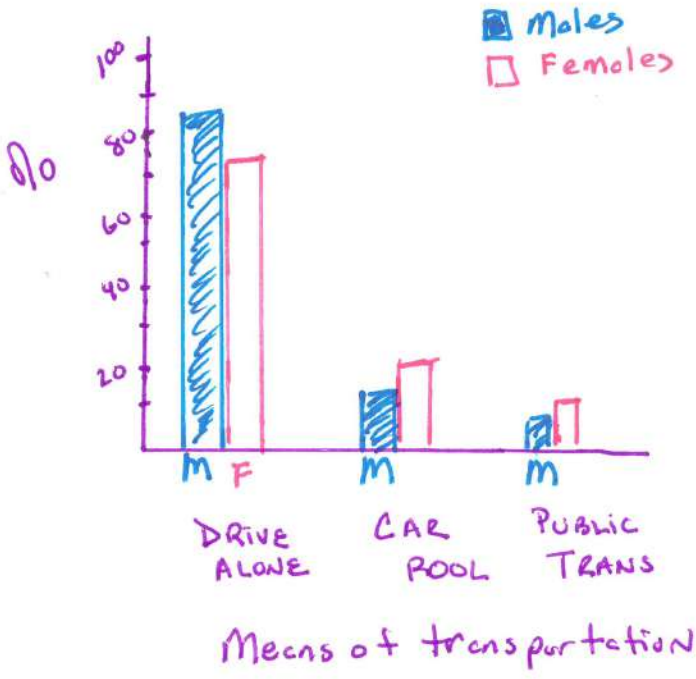
∴ Could round to units or Tenths.

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.

"Gender explains means of transportation" ⇓ Conditional Variable

	Drive alone	Car Pool	Public transportation	Totals
Male	113 84%	16 12%	6 4%	135 100%
Female	85 74%	23 20%	7 6%	115 100%

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.