

Ch 4.2: Relationships Between Categorical Variables

EQ:

Recall: Relationships Between Two _____

- _____
- _____
- _____

Relationships Between Two _____

Terms To Know:

Stress	Reflux		Total
	No	Yes	
No	251	4	255
Yes	131	33	164
Total	382	37	419

- Marginal Totals --- _____ for each _____ and _____

How many students said they were not stressed about school? _____

- Marginal Distributions --- _____ for each _____ and _____

What percent of the students complained about having acid-reflux? _____

- Joint Distributions --- _____ involving more than _____

What percent of these students said they were under stress but did not have acid-reflux? _____

- Conditional Distributions --- _____ for one variable across some _____ on the other variable

What percent of the non-stressed students complained about having acid-reflux? _____

What percent of the students said they were stressed given that they did not have acid-reflux? _____

- ❖ Use the two-way table above to answer these questions.

What is the probability a person responded they felt under stress?

What is the probability that a person responded they felt under stress and had reflux?

What is the probability that a person with reflux responded they felt under stress?

What is the probability that a person under stress responded they had reflux?

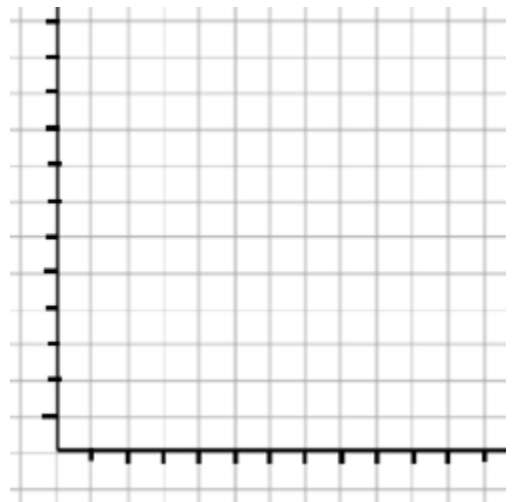
Example Problem:

The following two-way table reports data on all undergraduate students enrolled in U.S. colleges and universities in the fall of 1995 whose age was known.

Undergraduate College Enrollment, Fall 1995 (thousands of students)

Age	2-yr full-time	2-yr part-time	4-yr full-time	4-yr part-time	TOTAL
Under 18	41	125	75	45	
18 to 24	1378	1198	4607	588	
25 to 39	428	1427	1212	1321	
40 and up	119	723	225	605	
TOTAL					

1. Calculate the marginal totals. Place them in the table.
2. How many undergraduate students were enrolled in colleges and universities?
3. Calculate the relative frequency for each data value and place in the table.
4. What percent of the undergraduate students were 18 to 24 years old in the fall of the academic year?
5. What is one comparison you can make about undergraduate college enrollment in Fall 1995?
6. Find the percent of undergraduates enrolled in each of the **four types of program who were 18 to 24 years old**. Make a **bar graph** to compare the results. Why do think we chose this age group?
7. What is one comparison you can make about college enrollment of 18 to 24 yr olds in Fall 1995?



8. An association of two-year colleges asks: “What percent of students enrolled part-time at 2-year colleges are 25 to 39 years old?”

9. A bank that makes education loans to adults asks: “What percent of all 25- to 39- year-old students are enrolled part-time at 2-year colleges?”

10. Create a contingency table relating the *conditional distributions of college program given age*.

Undergraduate College Enrollment, Fall 1995 (thousands of students)

Age	2-yr full-time	2-yr part-time	4-yr full-time	4-yr part-time
Under 18				
18 to 24				
25 to 39				
40 and up				

11. What is one comparison you can make from the table in #10?

12. Explain the difference in the information you provided for #5, #7, and #11.