Two-Way Relative Frequency Tables

- Topic: Two-Way Relative Frequency Tables

- Objective: Students will be able to identify, complete, and interpret two-way relative frequency tables.

- Standards:AP Stats: UNC-1 (EU), UNC-1.P (LO), UNC-1.P.3 (EK)
CCSS Math: 8.SP.A.4

Two-Way Relative Frequency Tables

- Two-way relative frequency tables show us percentages rather than counts. They are good for seeing if there is an association between two variables.

Two-Way Relative Frequency Tables

Percent, Decimal, Fraction: different versions of the same number

$$\frac{\text{PART}}{\text{WHOLE}}$$

$\frac{9}{27} = \frac{1}{3}$ $\frac{2}{3}$

B G

$$\frac{\%}{100} = \frac{\text{PART}}{\text{WHOLE}}$$

$\frac{33.3}{100} = \frac{9}{x}$

$33.3x = 900$

$\div 27$ $\div 33.3$

Two-Way Relative Frequency Tables

- Percentages: $\frac{\%}{100} = \frac{\text{PART}}{\text{WHOLE}}$
- Example: Your shopping for a new pair of sneakers that cost $150. You found an online coupon for 30% off, what is the sale price of the sneakers?

$\frac{30}{100} = \frac{x}{150}$

$4500 = 100x$

$\frac{4500}{100} = \frac{100x}{100}$

$45 = x$

$45

$105

150

− 45

$105

70% "on"

$$\frac{70}{100} = \frac{x}{150}$$

$$\frac{100x}{100} = \frac{10500}{100}$$

$$x = 105$$

Example 2: You're buying a new laptop for school. The original price is $900. If the sale price is now $720. What was the discount you received?

$$\frac{\%}{100} = \frac{\text{PART}}{\text{WHOLE}}$$

$$\frac{x}{100} \quad \frac{720}{900}$$

$$\frac{900x}{900} = \frac{72000}{900} \qquad \frac{80}{100} \quad -20$$

$$x = 80\%$$

Two-Way Relative Frequency Tables

- Part 1: Making a relative frequency table
  - > A university surveyed its 200 students on their opinions of campus housing.
  - > Convert the two-way frequency table of the data into a two-way table of row relative frequencies.
  - > (If necessary, round your answers to the nearest percent.)

Freq. counts

Gender	Positive opinion	Negative opinion	Neutral opinion	TOTAL
Male	40	36	14	90
Female	42	56	12	110
TOTAL	82	92	26	200

Rel. Freq. %

Gender	Positive opinion	Negative opinion	Neutral opinion	TOTAL
Male	44 %	40 %	15 %	100%
Female	38 %	50 %	11 %	100%

15

100 100 100

1.00 1.00

Two-Way Relative Frequency Tables

- Part 2: Reading a relative frequency table
  - > What percent of males had a negative opinion of campus housing? Round your answer to the nearest percent.
  - > What percent of females had a negative opinion of campus housing? Round your answer to the nearest percent.

Gender	Positive opinion	Negative opinion	Neutral opinion	TOTAL
Male	40	36	14	90
Female	42	56	12	110
TOTAL	82	92	26	200

Gender	Positive opinion	Negative opinion	Neutral opinion	TOTAL
Male	%	40%	%	100%
Female	%	50%	%	100%

Two-Way Relative Frequency Tables

- Part 3: Seeing a relationship in a two-way relative frequency table
  - > Based on the relative frequencies from above, which is a valid conclusion about the relationship between gender and opinion in this data?

Choose 1 answer:

(A) There is an association between gender and opinion. Males are more likely to have a negative opinion of campus housing.

(B) There is an association between gender and opinion. Females are more likely to have a negative opinion of campus housing.

(C) There is no association between gender and opinion.

Gender	Positive opinion	Negative opinion	Neutral opinion	TOTAL
Male	40	36	14	90
Female	42	56	12	110
TOTAL	82	92	26	200

Gender	Positive opinion	Negative opinion	Neutral opinion	TOTAL
Male	☐ %	40 %	☐ %	100%
Female	☐ %	50 %	☐ %	100%

Two-Way Relative Frequency Tables

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Gender	Positive opinion	Negative opinion	Neutral opinion	TOTAL
Male	☐ %	☐ %	☐ %	100%
Female	☐ %	☐ %	☐ %	100%

We saw that 40 percent of males had a negative opinion of housing, while about 51 percent of females had a negative opinion of housing.

There is an association between gender and opinion. Females are more likely to have a negative opinion of campus housing.