

Frequency Tables

How can you recognize possible associations & trends between two categories of categorical data?

Quantitative data	<u>data expressed with numbers</u>																
Categorical Data	ex: <u>age, height, gpa</u> <u>data that can't be expressed with numbers</u>																
Frequency table	ex: <u>hair color, tattoos?</u> shows <u>how often each items occurs in a set of categorical data</u>																
Two-Way Frequency Table	two categorical variables! gender place of birth																
Example:	<table border="1"> <thead> <tr> <th></th> <th>USA born</th> <th>not USA born</th> <th>Total</th> </tr> </thead> <tbody> <tr> <th>M</th> <td>6</td> <td>7</td> <td>13</td> </tr> <tr> <th>F</th> <td>6</td> <td>9</td> <td>15</td> </tr> <tr> <th>Total</th> <td>12</td> <td>16</td> <td>28</td> </tr> </tbody> </table>		USA born	not USA born	Total	M	6	7	13	F	6	9	15	Total	12	16	28
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Total	12	16	28														
Relative Frequency	the frequency of a category related to the total (frequency of category divided by total frequency)																
Joint relative frequency	<table border="1"> <thead> <tr> <th></th> <th>USA</th> <th>not USA</th> <th>Total</th> </tr> </thead> <tbody> <tr> <th>M</th> <td>$\frac{6}{28} = 0.214 = 21\%$</td> <td>$\frac{7}{28} = 0.25 = 25\%$</td> <td>$\frac{13}{28} = 0.46 = 46\%$</td> </tr> <tr> <th>F</th> <td>$\frac{6}{28} = 0.214 = 21\%$</td> <td>$\frac{9}{28} = 0.32 = 32\%$</td> <td>$\frac{15}{28} = 0.53 = 53\%$</td> </tr> <tr> <th>Total</th> <td>$\frac{12}{28} = 43\%$</td> <td>$\frac{16}{28} = 57\%$</td> <td>$\frac{28}{28} = 1$</td> </tr> </tbody> </table> <p>One frequency by total frequency</p> <p>$\frac{\text{USA born females}}{\text{total}} = \frac{6}{28} = 0.214 = 21\%$</p>		USA	not USA	Total	M	$\frac{6}{28} = 0.214 = 21\%$	$\frac{7}{28} = 0.25 = 25\%$	$\frac{13}{28} = 0.46 = 46\%$	F	$\frac{6}{28} = 0.214 = 21\%$	$\frac{9}{28} = 0.32 = 32\%$	$\frac{15}{28} = 0.53 = 53\%$	Total	$\frac{12}{28} = 43\%$	$\frac{16}{28} = 57\%$	$\frac{28}{28} = 1$
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Marginal Relative frequency	Total of one variable by total frequency $\frac{\text{total USA born}}{\text{total}} = \frac{12}{28} = 0.428 = 43\%$																
Conditional relative frequency table	One frequency by total of one category's frequency based on gender <table border="1"> <thead> <tr> <th></th> <th>USA born</th> <th>not USA born</th> <th>Total</th> </tr> </thead> <tbody> <tr> <th>M</th> <td>$\frac{6}{13} = 0.46$</td> <td>$\frac{7}{13} = 0.54$</td> <td>13</td> </tr> <tr> <th>F</th> <td>$\frac{6}{15} = 0.4$</td> <td>$\frac{9}{15} = 0.6$</td> <td>15</td> </tr> <tr> <th>Total</th> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>male & USA male</p>		USA born	not USA born	Total	M	$\frac{6}{13} = 0.46$	$\frac{7}{13} = 0.54$	13	F	$\frac{6}{15} = 0.4$	$\frac{9}{15} = 0.6$	15	Total			
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Association	To determine if there is an association between two categories of data, check the conditional relative frequency --if the conditional relative frequencies are the same for each factor, there is no association For example, are males & females equally likely to be born in the USA? technically no, so you would say there IS an association between gender and place of birth																