

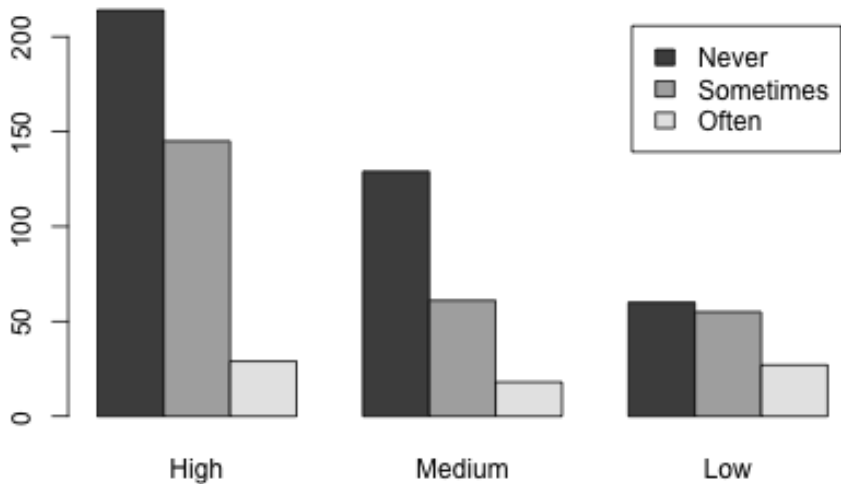
# Lesson 19: Inference for Several Proportions, Goodness-of-Fit, and Independence

## Homework

### Solutions

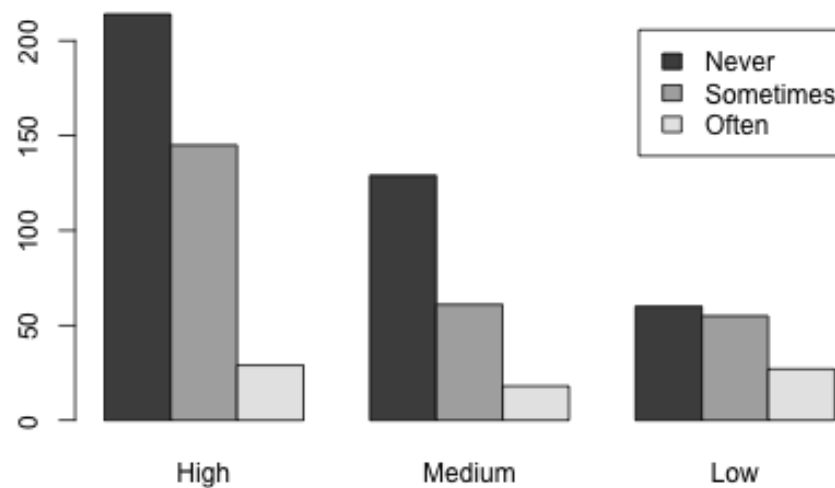
Please note that the steps show rounded numbers, but that the final answers to the problems are calculated without rounding.

| Problem | Part | Solution   |
|---------|------|--|
| 1       | -    | The requirements are met because all expected counts are greater than or equal to five |



|   |   |  |
|---|---|--|
| 2 | - |  |
| 3 | - | $H_0$ : Religiosity and frequency of anger are independent<br>$H_a$ : Religiosity and frequency of anger are not independent           |
| 4 | - | $\chi^2 = 23.474$<br>$df = 4$  |
| 5 | - | P-value = 0.0001   |
| 6 | - | reject the null hypothesis   |
| 7 | - | There is sufficient evidence to suggest that religiosity and frequency of anger at something beyond one’s control are not independent. |
| 8 | - | The requirements are met because all expected counts are greater than or equal to five   |

| Problem | Part | Solution |
|---------|------|----------|
|---------|------|----------|

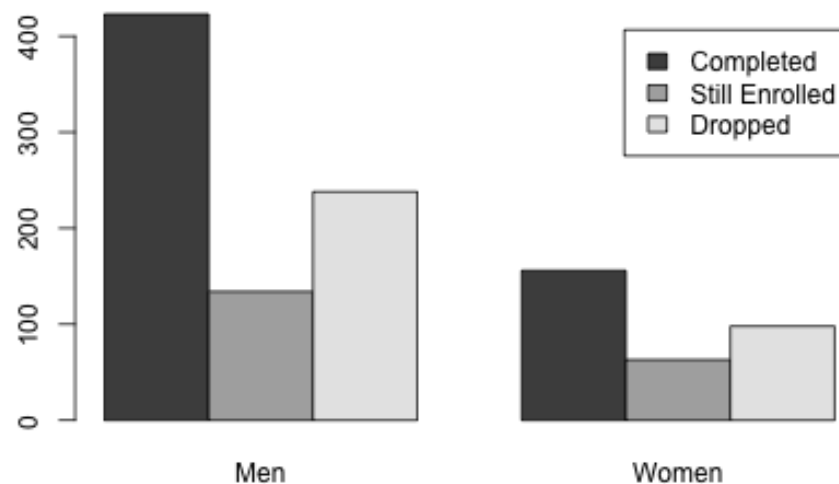


- 9 -
- 10 -  $H_0$  : Family structure and whether a girl goes to college are independent  
 $H_a$  : Family structure and whether a girl goes to college are not independent
- 11 -  $\chi^2 = 10.357$   
 $df = 3$
- 12 - P-value = 0.016
- 13 - reject the null hypothesis
- 14 - There is sufficient evidence to suggest that family structure and whether a girl goes to college are not independent
- 15 - The requirements are met because all expected counts are greater than or equal to five

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| Problem | Part | Solution |
|---------|------|----------|
|---------|------|----------|

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|----|---|---|
| 16 | - |   |
| 17 | - | $H_0$ : Gender and PhD status are independent   |
|    |   | $H_a$ : Gender and PhD status are not independent.  |
| 18 | - | $\chi^2 = 1.932$  |
|    |   | $df = 2$  |
| 19 | - | P-value = 0.381   |
| 20 | - | fail to reject the null hypothesis  |
| 21 | - | There is insufficient evidence to conclude that a student's gender and status in a PhD program are not independent. |

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