

| | High School | Bachelors | Masters | Phd | Total |
|--------|-------------|-----------|---------|-------|-------|
| Female | 54 | 46 | 41 | 201 | 342 |
| Male | 48.6 | 49.1 | 48.6 | 195.8 | 348 |
| Total | 98 | 99 | 98 | 395 | 690 |

$$\begin{aligned}
 \text{chi-value} = & \frac{(54 - 48.6)^2}{48.6} + \frac{(46 - 49.1)^2}{49.1} + \frac{(41 - 48.6)^2}{48.6} \\
 & + \frac{(201 - 195.8)^2}{195.8} + \frac{(44 - 49.4)^2}{49.4} + \frac{(57 - 49.9)^2}{49.9} + \frac{(194 - 199.2)^2}{49.4} \\
 & + \frac{(199.2 - 199.2)^2}{199.2}
 \end{aligned}$$

$$\begin{aligned}
 &= 0.6 + 0.2 + 1.2 + 0.15 + 0.6 \\
 &\quad + 0.2 + 1.17 + 0.13 \\
 &= 4.25
 \end{aligned}$$

$$df = 8$$

$$\text{chi-value (at 5% sig)} = 2.733 \quad 15.51$$

Since $4.25 > 2.733$ $15.51 > 4.25$

\Rightarrow Variables are dependent

| A | B | C | D | E | F | G | H |
|----|-----------------|---|---------|----------|----------------|----------------|----------------|
| 1 | Group 1 | Group 2 | Group 3 | average | (G1_mean-G1)^2 | (G2_mean-G2)^3 | (G3_mean-G3)^3 |
| 2 | 51 | 23 | 56 | 43.33333 | 7.84 | 153.76 | 190.44 |
| 3 | 45 | 43 | 76 | 54.66667 | 10.24 | 57.76 | 38.44 |
| 4 | 33 | 23 | 74 | 43.33333 | 231.04 | 153.76 | 17.64 |
| 5 | 45 | 43 | 87 | 58.33333 | 10.24 | 57.76 | 295.84 |
| 6 | 67 | 45 | 56 | 56 | 353.44 | 92.16 | 190.44 |
| 7 | average | 48.2 | 35.4 | 69.8 | 51.13333 | 612.8 | 732.8 |
| 8 | | | | | | | |
| 9 | SS_between = | 3022.933 | | | | | |
| 10 | MSST= | 1511.467 | | | | | |
| 11 | SS_witin= | 1860.8 | | | | | |
| 12 | MSSE = | 232.6 | | | | | |
| 13 | F-statistic = | 6.498137 | | | | | |
| 14 | F-critica(2,8)= | 4.45 | | | | | |
| 15 | | Since F-statistic is greater we reject Null | | | | | |

| | | | |
|----|----------------|----------|-------------|
| 16 | | | mean |
| 17 | | 10 | 7.5 |
| 18 | | 20 | 15 |
| 19 | | 30 | 22.5 |
| 20 | | 40 | 30 |
| 21 | | 50 | 37.5 |
| 22 | mean | 30 | 22.5 |
| 23 | SS_between1= | 225 | |
| 24 | MSST1= | 225 | |
| 25 | SS_between2 = | 2812.5 | |
| 26 | MSST2= | 703.125 | |
| 27 | TSS= | 1812.5 | |
| 28 | SSE= | 884.375 | |
| 29 | dof=4 | | |
| 30 | MSSE = | 221.0938 | |
| 31 | F1= | 1.017668 | Accept Null |
| 32 | F2= | 3.180212 | Accept Null |
| 33 | Fcritical(1,4) | 7.71 | |