

Chapter 10 chi square (χ^2) exercise

For the following crosstab, please go through the chi-square process to determine its p level, decision about the null hypothesis, and type of error committed.

| | White men | White women | Black men | Black women | RM |
|---------------|------------|-------------|-----------|-------------|-----------|
| Kamela Harris | 258 () | 312 () | 97 () | 108 () | 775 |
| Donald Trump | 364 () | 306 () | 12 () | 5 () | 687 |
| CM | 622 | 618 | 109 | 113 | N = 1,462 |

1) Null hypothesis

Gender/race of the voter has nothing to do with whom they vote for

2) Computing the expected frequencies

$$F_E = \frac{RM \times CM}{N}$$

3) Computing the chi-square

$$\chi^2 = \sum \frac{(F_o - F_e)^2}{F_e} = 173.6$$

4) Computing the degree of freedom

$$df = (r - 1)(c - 1) \quad r: \text{the number of rows}; c: \text{the number of columns}$$

$$df = 3$$

5) Determining the p level

$$P < .001$$

6) Decision regarding the null hypothesis, and type of error committed

Reject the null hypothesis, committing type I error