Contingency table examples with answers

The chi-squared statistics (U) is where U has a chi-squared with υ degree of freedom; χ2 (υ) where υ = (m-1)(n-1). Thus, the degree of freedom for the example here is (2-1)(2-1) = 1. Using the example above, U = (83-61.95)2 + (35-56.05)2 + (22-43.05)2 + (60-38.95)2 61.95 56.05 43.05 38.95 U ≈ 36.73 Well, does this represents a large or small difference? To figure that out, we need to use a critical value (c). You can think of this critical value c as the cut-off point where beyond a certain number the value U is considered large. This critical value c is decided by two factors, the degree of freedom υ and the level of significant that we desired to have. Usually, we will choose 5% significant level, that is, we are only willing to accept 5% or less probability that we rejected the null hypothesis wrongly, i.e. when the null hypothesis is actually true. In our case, the critical value is determined by 1 degree of freedom at 5% significant level. From the chi-squared table , the corresponding critical value with 1 degree of freedom and 5% significant level is 3.841. Reading from the chi-squared table is tedious. Is there another way that I can use to determine the size of U? The answer is yes. There are three methods using Excel. Method 1. Open up Excel. Use any cell and click [fx] on the ruler. This is the "Paste Function" button. Select "Statistical-CHIINV." CHIINV(probability,degree_of_freedom) takes two variables; probability which is our level of significant and degree of freedom. It returns the critical value. So for the critical value at 5% significant level at 1 degree of freedom, we will enter probability = 0.05 and degree_of_freedom = 1. Carry out the comparison between U and this critical value as outlined in the procedure above. Method 2. Open up Excel. Use any cell and click [fx] on the ruler. This is the "Paste Function" button. Select "Statistical-CHIDIST." CHIDIST(x,degree_of_freedom) takes two variables; x, this is our U value and degree of freedom. It returns the probability of U at one tail on the chi-squared distribution. In this example, the returned probability is 1.36E-09. Your report should be as follows: U = 36.73 (p