

Categorical Data Analysis: HW 4

1. Look at the results of the survey on belief in life after death, which you should be able to access at

https://docs.google.com/spreadsheets/d/1803wbSGL_LdjZn-_Iv0lwRWg1jZqqYE9e8e6Aj11bvA/edit?usp=sharing

- (a) Compute and interpret (just explain what it means in context) the i.) difference of proportion, ii.) the ratio of proportion and iii.) the odds ratio for comparing the proportion of believing in life after death for females and males.
 - (b) Find a 95% confidence interval for each of the 3 measures.
 - (c) Conduct a score test to test the null hypothesis that the two proportions are the same against the alternative that the difference is different from zero.
2. Remember that the Delta method says that if T is asymptotically normal with mean μ and variance σ^2/n , then $g(T)$ is, under mild conditions on the function g , also asymptotically normal with mean $g(\mu)$ and variance $[g'(\mu)]^2\sigma^2/n$. Now, suppose $Y \sim \text{Bin}(n, \pi)$. Using the Delta method, derive the asymptotic distribution of $\log(1 - \hat{\pi})$, where $\hat{\pi} = y/n$.