

Final Exam

1. A researcher is testing the use of three different formats for the same product: Print, Online, CD. Respondents indicated their use of the product on an ordinal scale (1=Never, 2=Rarely, 3=Sometimes, 4=Often/Always). The data is available on the web page. In analyzing the data, eliminate “.” as a response category.
 - (a) Cross-classify the three responses. Are there empty cells?
 - (b) Eliminate empty cells by adding .01 to all empty and non-empty cells (I have shown how to do this in class, but you may find it easier to input a full table manually). Is there evidence of marginal homogeneity in the use of the 3 formats?
 - (c) Repeat the test of marginal homogeneity, but add .5 instead of .01. How much is the analysis affected?
 - (d) Return to the analysis in which .01 was added to each cell. If marginal homogeneity holds, explain the test outcome by interpreting the parameter estimates output by SAS.
2. In our study of loglinear models, I had quickly identified one possible model for the free speech GSS data (see the SAS code on the webpage).
 - (a) Analyze the suicide data in depth (i.e., select a model and do some residual analysis).
 - (b) Using your model terms, write out a formula for the mean response μ_{ijkl} and the mean marginal response μ_{ij++} . Find formulas for $\theta_{ij(kl)}$ and θ_{ij++} —these are conditional and marginal odds ratios. Find estimates for these odds ratios and comment.
3. Show that the cumulative probabilities $P(Y \leq j | x)$ for the proportional odds model (7.5) do not intersect. You may assume that $\alpha_{j+1} < \alpha_j$, $j = 1, \dots, J - 1$ and that x represents a single covariate. Refer to the non-proportional odds model in PROC CATMOD for the teacher evaluation data (this is the first PROC CATMOD procedure in that file). Find at least one value of x for which at least two of the cumulative probability curves intersect.