GSERMCDA17 A3: ORM+MNLM

Your Name: Points received: ____ out of 150

In this assignment, you will estimate the same model using both the ordinal logit model (OLM) and multinomial logit model (MNLM), and interpret the results.

1. ___ of 5: Using one of the data sets for class, choose or create a substantively reasonable, ordinal dependent variable with at least four categories (I'll refer to it as Y). Choose or create at least four independent variables: a binary variable B; a continuous variable C; and two additional variables X and W. Keep only the variables you will be using and drop all missing cases (listwise deletion). Demonstrate that the data are clean by including output from `codebook, compact` and `sum`.

2. ___ of 5: Estimate the OLM regressing Y on C, B, X and W. Include the output from `ologit`.

4. ___ of 5: Use `listcoef` to compute the factor (or percent change) in the odds. Highlight the numbers used to answer questions 5 and 6 and indicate which question they are used for.

5. ___ of 5: Using the factor change coefficient, describe the effect of C as though it is part of a published paper. Use either standardized or unstandardized coefficients, and include information on statistical significance.

6. ___ of 5: Using the factor change coefficient, describe the effect of B as though it is part of a published paper. Include information on statistical significance.

7. ___ of 5: Using `mchange`, compute the discrete change coefficients for C and B with covariates held at their mean. Include this output.

8. ___ of 5: Describe the discrete change for B as though it were part of a published paper. It is not necessary to interpret the discrete change for all categories of the dependent variable (although you should interpret more than just one). Instead of listing the effect of B on each outcome category, paint an overall picture of the effect. Include information on statistical significance in your interpretation.

9. ___ of 5: Choose **one** appropriate form of the discrete change coefficients (e.g., change from min to max, unit change, standard deviation change) for C from the output in 7 above. Describe the discrete change for C as though it were part of a published paper. Include information on statistical significance in your interpretation.

10. ___ of 15: Use `mgen` to calculate the predicted probability of Y across the range of C. Hold the other variables at their means. Use the `graph` command to construct **either** a plot of predicted probabilities **or** a plot of cumulative predicted probabilities. Whichever plot you choose, be certain that the reader can easily determine which region of the graph corresponds to which categories. Include the plot and the commands used to create the plot in your write-up.

11. ___ of 15: Using your plot from question 12, describe the effect of C on Pr(Y). This should read as though it were part of a published paper and should include the magnitude of effects (obtained using `mchange` or `margins`) and information on statistical significance where necessary (obtained using `margins`). It is not necessary to list or interpret the effect of C on each category of the dependent variable. Rather, paint an overall picture of the effect.

14. ___ of 10: Use `brant` to test the parallel regression assumption. Include the output and highlight the numbers used. Describe the results of the test as though it were part of a published paper. Report on both the omnibus test & specific variables.

15. ___ of 5: Using the same variables as in (2), estimate the MNLM of Y on C, B, X, and W. Include the output from `listcoef, help`.

16. ___ of 5: Use `mlogtest` to compute both a Wald and LR test that the effect of B is zero; and then do the same for C. Write up the results of the Wald test **OR** the LR test (not both) of C as though it were part of a published paper.

17. ___ of 10: Use `mlogitplot` to create an **odds ratio plot** for variables C and B. Include lines to indicate statistical significance at the 0.05 level. Use the note option to provide a key to the meaning of the symbols. Show the plot.

18. ___ of 10: Use `mchange` to compute the discrete change in probabilities for C and B with other variables held at some value you find interesting or useful. Only show the output for variables C and B. Use or `mchangeplot` to **plot the discrete changes** for C and B that you find interesting or useful. Use the note option to provide a key to the symbols in the plot. Show the plot.

19. ___ of 15: What do you learn substantively from the information on discrete changes that was not clear from the information on odds ratios? What do you learn substantively from the information on odds ratios that was not clear from the information on discrete changes?

20. ___ of 15: Answer the following questions, in 2-3 sentences each:
    a) Based on your results from the OLM, MNLM and Brant test, which model specification for Y do you prefer? Why?
    b) How did the MNLM's relaxing of the proportional odds assumption change understanding of the relationship between B & C and Y?

21. ___ of 15 **EXTRA CREDIT**: In 2002 the International Social Survey Program fielded the "Family and Changing Gender Roles III" module that included the following question: "A working mother can establish just as warm and secure a relationship with her children as a mother who does not work." The response categories are: 1. Strongly agree; 2. Agree; 3. Neither agree nor disagree; 4. Disagree; 5. Strongly disagree. However, the codebook reports that in the US the category '4. Disagree' is omitted. Give simple and direct answers to the following:

    a) Assume that the question was asked with all categories presented, but that a programming error led to categories 4 and 5 being combined. Would it be reasonable to compare the factor change coefficients from a model estimated in the US to those from other countries where the categories were not collapsed? What about the discrete change coefficients?

    b) Now assume that the error was made by forgetting to include 'disagree' on the survey itself (i.e., respondents did not get a chance to choose disagree.). Would it be reasonable to compare the factor change coefficients from a model estimated in the US to those from other countries? What about the discrete change coefficients?

22. ___ of 10: My assessment of the overall effectiveness of your answers.