Soc 73994, Homework #10
Advanced Ordinal Regression Models

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All answers should be typed and mailed to the TA. Be sure your response includes your name, the date, and a clear title, e.g. Homework # 10. If there is a huge amount of output for any analyses you run yourself, you may want to be selective in what you copy and paste into your assignment (but make sure you include enough so it is clear what commands you executed, e.g. you might show all the commands but only parts of the output).

This assignment focuses on generalized ordered logit (gologit) models and heterogeneous choice models. First you will discuss a pre-worked example. Then you will do a similar analysis using a data set of your choice.

1.   Run the following code. You can add other commands if you want.

```
webuse nhanes2f, clear
ologit health i.female i.black weight, nolog
brant, detail
est store ologit
mtable, at(female = (0 1))
mtable, dydx(female)

gologit2 health i.female i.black weight, auto
est store gologit2
mtable, at(female = (0 1))
mtable, dydx(female)
lrtest ologit gologit2, force stats

oglm health i.female i.black weight, het(i.female)
est store oglm
mtable, at(female = (0 1))
mtable, dydx(female)

lrtest gologit2 oglm, force stats
```

Now answer the following questions.

   a. The proportional odds assumption is violated. Besides the Brant test, what other evidence indicates that this is the case?
   b. Specifically, the variable female violates the propoprtional odds assumption. Cite at least two pieces of evidence that show you this.
   c. Interpret the gologit2 results. Pay particular attention to the effect of female. Give one or more substantive explanations that might explain what female's failure to meet the proportional odds assumption might mean. Add any other comments you want about the substantive meaning of the results.

    d.   Interpret the oglm results. Pay particular attention to the effect of female in the variance equation. What does the coefficient mean? In what ways is this suggesting similar things to what the gologit2 results suggested? Add any other comments you want about the substantive meaning of the results.

    e.   I would argue that in this instance, at least on a purely empirical basis, the oglm model is as good or better than the gologit2 model. What arguments can justify this claim? Compare the models in terms of fit, parsimony, interpretation of results, and adjusted predictions and marginal effects.

2.   Do similar analyses using a data set of your choice. Ideally you will use your own data for this but you can use something else. Note that, if you normally use the svy: prefix with your data, the brant and lrtest commands will not work but I think the other commands should. You don't have to perfectly mirror the above analysis but see if a gologit and/or oglm model can offer you any helpful insights.