

## ologit problems on hypothesis testing and interpretation of results

We will discuss these and/or similar questions in class, so prepare for these beforehand. Hypothesis testing and interpretation of results is very similar in `ologit` and `logit`. If in doubt, see Long and Freese and/or the help for `ologit`.

Begin with the following. Then give whatever other commands you need to answer the rest of the questions. (If you estimate other models though, remember to go back to the full model when answering subsequent questions.)

```
use http://www.nd.edu/~rwilliam/xsoc73994/long2006/ordwarm2.dta, clear
ologit warm yr89 male white age ed prst
```

Now do the following:

- Briefly discuss what the results tell you about the effects of each independent variable on attitudes toward working mothers.
- Test the hypothesis that all coefficients equal zero.
- Do a Wald test of the hypothesis that the effects of age and ed both equal zero.
- Do a Wald test of the hypothesis that the effect of male equals the effect of white.
- Do a BIC test of the hypothesis that the effect of prst is zero.
- Compute the predicted probabilities.
- Use the `leastlikely` command to identify the most discrepant cases, i.e. the in-sample observations with the lowest predicted probabilities of observing the outcome value that was actually observed. Be sure to list the variables in the model so that the output is meaningful.
- Compute the standardized coefficients. Choose at least one and explain how to interpret it.
- Using commands like `prvalue`, `prchange` and/or `prtab`, determine:
  - The predicted probabilities for “average” individuals in 1977 and 1989
  - The predicted probabilities for “average” men and women in 1977 and 1989
  - Briefly interpret the results
- Run the `mfx2` command (you’ll need to install it if you haven’t already). `mfx2` is a convenient command for getting MEMs after multiple outcome commands like `ologit`. What do the results tell you about the effect of white?
- Here is how you can redo the last two problems using `margins`. You can also use this as a check on your earlier results. Despite the many great features of `margins`, I must say that the `spost9` and `mfx2` commands have a HUGE edge when it comes to ease of use and readability of output after commands like `ologit`. Optional: Try rerunning part or all of these analyses without using `atmeans` (i.e. using the default `asobserved`) and interpret the results.

```

* Now use margins - unfortunately, each outcome requires a line!
* Rerun ologit using factor variables
ologit warm i.yr89 i.male i.white age ed prst
* predicted probabilities for "average" individuals in 1977 and 1989
margins yr89, atmeans predict(outcome(1))
margins yr89, atmeans predict(outcome(2))
margins yr89, atmeans predict(outcome(3))
margins yr89, atmeans predict(outcome(4))
* predicted probabilities for "average" men and women in 1977 and 1989
margins yr89#male, atmeans predict(outcome(1))
margins yr89#male, atmeans predict(outcome(2))
margins yr89#male, atmeans predict(outcome(3))
margins yr89#male, atmeans predict(outcome(4))
* MEMs using margins
margins, dydx(*) atmeans predict(outcome(1))
margins, dydx(*) atmeans predict(outcome(2))
margins, dydx(*) atmeans predict(outcome(3))
margins, dydx(*) atmeans predict(outcome(4))

```

- Using the Brant test or some other means, test whether the assumptions of the ordered logit model are met. If not, what variables seem especially problematic?
- Williams (2010) suggests that, when the assumptions of the ordered logit model are violated, a heterogeneous choice model may sometimes be a suitable alternative. In particular he suggests that variables that violate the parallel lines/ proportional odds assumption may be candidates for inclusion in the variance equation. Estimate such a model using `oglm` and interpret the results. Use LR Chi-square, BIC and AIC tests to evaluate whether the heterogeneous choice model provides a better fit than the ordered logit model.
- Finally, feel free to suggest any other analyses you think would help with the interpretation of the results.