Introduction to Applied Bayesian Modeling for the Social Sciences

ICPSR 2012

Homework 6 – July 6, 2012
Due: Monday, July 9, via email to `johannes.karreth@colorado.edu`.
Please send your assignment in one PDF file if possible.

For this exercise you will fit either an ordered logit *or* a multinomial logit model in WinBUGS or JAGS.

Use the file(s): `ordered.logit.dta` or `mnl.data.dta`. Again, you need to convert the data from Stata format into WinBUGS format. Be sure to convert string variables to numeric variables and to delete cases with missing values (**R** hint: `na.omit()`). Make sure no variable name exceeds 8 letters. Also check if any variables should be rescaled or transformed, and feel free to standardize variables.

Your choice of initial values will be important in the ordered logit model (less so in the MNL). JAGS users: make sure you adjust your model code to the slight difference in the JAGS language for sorting parameters (see section 6.2 in the JAGS tutorial).

For the MNL, feel free to use any/all of the variables in the data set. JAGS users: no adjustments from WinBUGS code should be necessary.

For a description of the data sets refer to the next two pages. Example code from the models presented in class are in `Z:/bakker/applied.bayes.2012/Slides and Lecture Materials/Day 13` (look for the `beer.ologit.odc` and `mnl.odc` files).

Fit the models, assess convergence and supply a brief interpretation of the results. *Be careful* (esp. JAGS users): Most of these model specifications might take some time to converge, so start with a small number of iterations (only 10 or 20). If you have time, feel free to present predicted probabilities.

Enjoy!!
p.s. You can do it!

Ordered Logit

Preliminaries and Data

Conventional wisdom among scholars of interest groups in American politics states that a primary goal of groups is to develop and maintain access to policy makers. While much of this work has focused on groups' ties to members of Congress, sometimes equally important is the extent to which groups cultivate connections within executive and regulatory agencies.

Here, you will examine the causes of group access to federal agencies. The data are from a 1985 survey by the late Jack Walker of interest groups and associations listed in Congressional Quarterly's Washington Information Directory ($N = 892$). A screening question identified 787 groups who reported at least one contact with a cabinet department or independent agency during the year prior to the study. These groups were then asked:

> "For the federal agency with which this association communicates, consults or interacts the most, does this association interact with it frequently, occasionally, seldom, or almost never?"

The dependent variable `interact` captures the groups' responses, with observations coded 1 for "almost never," 2 for "seldom," 3 for "occasionally" and 4 for "frequently."

The data also contain three general types of variables. `age` is the age of the group, in years (i.e., 1985 - the year the association was founded). `taxexmpt` is an indicator of tax-exempt status. Two other variables tap the nature of the group's membership: `indmembs` is coded 1 for groups whose members consist of individual persons, and 0 otherwise; `orgmembs` is coded 1 for associations where members are themselves associations (e.g "peak associations") and 0 otherwise (groups coded 0 on both variables are "mixed," having members of both types).

Dataset: `ordered.logit.dta`

Multinomial Logit

Preliminaries and Data

The time was January, 2005. Condoleeza Rice was sworn in as the first African-American Secretary of State, Mahmoud Abbas was declared the winner of the Palestinian election, and (perhaps most important) Texas light sweet crude was selling for the princely sum of $45 a barrel. It was during those innocent, happier days that ABC News and the Washington Post commissioned a poll about public opinion on traffic. Among other things, pollsters asked 1,204 lucky, randomly-selected Americans:

> "What kind of vehicle do you usually drive – a car, an SUV, a pickup truck, or what?"

What does this have to do with political science? The answer ought to be obvious.[1] We'll explore the political dynamics of car ownership, using the data from the 2005 ABC/WP poll. The main variable of interest is `cartype`, coded one for cars, two for SUVs, and three for pickup trucks. Covariates include dummy variables for `urban` residence, being `married`, having `kids`, and being `black` and/or `female`, as well as a naturally coded variable for `age` and an ordinal variable for level of `education`. Best of all, we also have two dichotomous variables for political party (`democrat` and `GOP`, with independents as our baseline) and a four-point ordinal scale indicating each respondent's approval or disapproval for President Bush.

Dataset: `mnl.data.dta`

[1] One example: Google search for `"suv-driving republicans"`? 3,040 hits. For `"suv-driving democrats"`? 9 hits. (Similar results obtain for pickups...).