

Exercise 5

- A. Add a covariate for grades to the model fit in Exercise 1. Carefully consider what latent class to use as the reference class in the multinomial logistic regression.

Note: You may wish to standardize the grades variable to facilitate interpretation of the odds ratios using the following code prior to executing PROC LCA.

```
PROC STANDARD DATA=MJ_USE MEAN=0 STD=1 OUT=MJ_USE;  
  VAR GRADE;  
RUN;
```

- B. Add a grouping variable for year to the model fit in (A). Interpret all beta parameters and odds ratios in the model (i.e., the effect of grades for each year). Be sure your interpretation is consistent with your choice for the reference class.

Optional (advanced SAS programming):

Create an odds ratio plot using the SAS macro `LCAGraphicsV1.sas`. The macro has a user's guide that describes its use. Note that odds ratio plots can be obtained for the model in Part A, as well as for the multiple-groups model in Part B.

Hints:

- (1) Save the macro file to your hard drive.
- (2) Specify that path in an `%include` statement prior to running LCA.
- (3) Add the statement `RHO PRIOR=1;` to the PROC LCA call so that standard errors can be estimated.
- (4) Execute the macro using the following syntax after running LCA:
`%OddsRatioPlot(ParamDataset=filename, StdErrDataset=filename);`