Homework 3-Instructions

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Outline

Question-1: *Early Head Start Program*

- **1.a.** Mediation model using bootstrap logistic regression.
- **1.b.** Multiple logistic regression diagnostics

Question-2: *Social Relationships Among Recent Widows (Morgan & Neal)*

- **2.a.** Lagged regression model
- **2.b.** Cumulative logistic model
- **2.c.** Ordinal probit model

Question-3: *National BIP Standards & Monitoring Study (Mankowski)*

- **3.a.** Logistic regression model diagnostics
- **3.b.** Probit regression model

Question-1: Early Head Start Program

Use the *second* Early Head Start data set (**child2.sav**)[1] for the following problems. The variable NEGLECT, which is a *count* of the number of child neglect reports, has been added to this data set.

[1] See Homework 2 Problem 2d

Question-1.*a*.

Include:
1. *Direct effect regression coefficients*
2. *Indirect effect coefficient*
3. *Bootstrap confidence limits*

Test a hypothesized mediational model *in which the race/ethnicity of the mother (WHITE) leads to child neglect reports (NEGLECT) which leads a higher risk of reported abuse (ABUSE).*

Question-1.*b*.

Conduct a multiple logistic regression *predicting ABUSE with PROGRAM, BOYFRIEND, WHITE, and WELFARE as predictors* (same as HW 2, problem 2d).

Report:
1. *What each diagnostic test tells you*
2. *The diagnostic values for any cases that you judge to be possible outliers or influential data points*

Obtain a residual plot *with standardized residuals on the y-axis and predicted probabilities on the x-axis, and casewise values for* $\Delta\chi^2$ *or* ΔD *and* $\Delta\beta$ *to check for outliers and influential data points.* State what each diagnostic test tells you and describe your findings.

QUESTION-2: SOCIAL RELATIONSHIPS AMONG RECENT WIDOWS (MORGAN & NEAL)

For the problem below, a new data set (**`widow.sav`**) was taken from a study conducted by David Morgan and Margaret Neal that examined social relationships among recent widows. A *yes/no* question about whether the respondent felt lonely was asked at two different time points (`LONELY1`, `LONELY2`), each six months apart. `AGE1` is the age of the respondent at Time 1 and `EDUC1` is the years of education. A question about income adequacy (`INCADQ1`), a $4-$ *pointrating* of the extent to which she felt she had enough money each month to get by, and self-rated health (`HEALTH1`) were both assessed at the first time point.

Question-2.*a*.

TEST A LAGGED REGRESSION MODEL to investigate whether income adequacy (`INCADQ1`) and health (`HEALTH1`) predicted loneliness at Time 2 (`LONELY2`) after controlling for loneliness at Time 1 (`LONELY1`). ***Pay special attention to the interpretation of the longitudinal model.***

INCLUDE:
1. *Regression coefficients*
2. *Odds ratios*
3. *Confidence limits*
4. *Model fit information*
5. *A pseudo-R^2 measure.*

Question-2.*b*.

TEST A CUMULATIVE LOGISTIC MODEL predicting the ordinal variable income adequacy (`INCADQ1`) with age (`AGE1`), education (`EDUC1`), and health (`HEALTH1`) as predictors.

INCLUDE:
1. *Regression coefficients*
2. *Odds ratios*
3. *Confidence limits*
4. *Model fit information*
5. *A pseudo-R^2 measure.*

Question-2.*c*.

TEST AN ORDINAL PROBIT MODEL with the same outcome and predictors as you used in the cumulative logistic model.

INCLUDE:
1. *Regression coefficients*
2. *Confidence limits*
3. *Model fit information*
4. *A pseudo-R^2 measure.*
5. *One or two sentences about how your results and conclusions compare to the logistic model above.*

QUESTION-3: NATIONAL BIP STANDARDS & MONITORING STUDY (MANKOWSKI)

You used your own data set for Problem 3 in HW 2. Do the following analyses with the same variables and the same data set.

Question-3.*a*.

TEST A LOGISTIC REGRESSION MODEL[2], and obtain a residual plot with standardized residuals on the y-axis and predicted probabilities on the x-axis, and casewise values for $\Delta\chi^2$ or ΔD and $\Delta\beta$ to check for outliers and influential data points.

REPORT:
1. *What each diagnostic test tells you*
2. *The diagnostic values for any cases that you judge to be possible outliers or influential data points*

[2] Use the *same model* you tested in `Problem 3 of Homework 2`

Question-3.*b*.

REPLICATE THE REGRESSION MODEL IN 3.*a*., but this time test a probit model.

INCLUDE:
1. *Regression coefficients*
2. *Confidence limits*
3. *Model fit information*
4. *A pseudo-R^2 measure.*
5. *One or two sentences about how your results and conclusions compare to the logistic model above.*