Questions 1–4 are based on the health91.sav data located on the Summer Program’s server z:/jacey/regression III/assignments and the course web site (on the "Assignments" page of http://polisci.msu.edu/jacey/icpsr/regress3). Recall from exercise 1 that these data are in SPSS format, meaning that you will need to use the foreign library to import them. Question 5 uses the Prestige data in the car library (more information about these data can be found by typing ?Prestige after loading the car library.)

1. Fit a linear regression model of HAPPY regressed on HHINCOME. Plot the fitted regression line on a scatterplot. Referring to the regression output, describe the effect of household income on happiness.

2. Explore the partial relationship of household income on happiness, controlling for class and sex. Start by constructing a conditioning plot. Continue by fitting a multiple regression model. Do the effects of household income differ from the effects in the simple regression model in the question above? Explain, and try to use information from both the conditioning plot and the numerical estimates. Next, assess the effects of social class by performing an incremental F-test (Use the Anova function in the car package to get the correct tests). Finally, fit and describe a model that excludes statistically insignificant effects.

3. Using the qvcalc package, graph the point estimates and confidence intervals based on quasi standard errors for social class (CLASS). Are there differences in average happiness levels according social class. How does the plot show this?

4. Fit a linear model regressing HAPPY on HHINCOME and CLASS, including an interaction between the two independent variables. Test for the effects of the interaction using an incremental F-test. Finally, graph the effects of household income conditional on social class in an effect display (use the effects package). Do this in two ways: (1) separate graphs for each social class; and (2) a single graph with effects for all social classes.

5. Load the Prestige data from the car library. Fit a linear model regressing prestige on type and education. Carry out an Incremental F-test to determine if the effect of occupation type is statistically significant. Attempt to construct a plot of the estimates and confidence intervals based on quasi standard errors for the effects of occupation type. Explain what happens and try to account for it.