

# Lab 8 Activity

PSYC 7804 - Spring 2026

Variable	Description
<b>Population</b>	population estimate as of July 1, 1975
<b>Income</b>	per capita income (1974)
<b>Illiteracy</b>	illiteracy (1970, percent of population)
<b>Life Exp</b>	life expectancy in years (1969–71)
<b>Murder</b>	murder and non-negligent manslaughter rate per 100,000 population (1976)
<b>HS Grad</b>	percent high-school graduates (1970)
<b>Frost</b>	mean number of days with minimum temperature below freezing (1931–1960) in capital or large city
<b>Area</b>	land area in square miles

Run the following code to name the data you will be using as `dat`:

```
dat <- data.frame(state.x77)

# Rename 2 columns that are named in slightly unusual way
colnames(dat)[c(4, 6)] <- c("Life_Exp", "HS_Grad")
```

1. Create two new columns that represent the mean-centered versions of the `HS_Grad` variable and the `Income` variable. For the remainder of the activity, use these centered variables as the predictors and treat `HS_Grad` as the moderator.
2. Run a regression predicting `Life_Exp` with an interaction between the mean-centered `HS_Grad` variable and the `Income`. Is the interaction term significantly different from 0? Should you interpret the other regression coefficients?

3. What is the expected value of the slope of **Income** when **HS\_grand** is equal to 20?
4. Calculate the simple slopes of **Income** at some values of **HS\_grand** that you believe should be informative. What is the meaning of the simple slopes? Focus on the sign of the slopes, the value will be really small due to the scale of the outcome.
5. Create both a simple slopes plot and a johnson-neyman plot to visualize the interaction between the two predictors. Outside what interval is the slope of **Income** significantly different from 0?