# PSYC 5316: Advanced Quantitative Methods



1. Compute and report descriptives for demographic data, specifically mean and SD for age and frequency counts for genders.
2. Import the performance data for all participants. How many trials were collected overall?
3. Filter out the "practice" trials. How many trials were removed? How many trials remain?
4. Filter out the trials on which an incorrect response was made. How many of these error trials were there? How many trials remain?
5. Due to possible coding inconsistencies, some trials may have been allowed to proceed longer than 2000 ms. If so, filter these out. How many of these long trials were there? Note that there may have been none. If you filtered out some “bad” trials, how many “good” trials remain?
6. Construct a plot similar to Figure 1 of Sternberg (1966). Specifically, you need to include the mean RT for each set size, closed and open dots for probe present (P) trials and probe not present (NP) trials, respectively, the regression line, and the error bars. Note: you do not need to include the dashed line on his original figure. Export this plot as a JPEG with resolution 600 x 400 and include it in your Word/OpenOffice document.
7. What is the $R^2$ value for the regression model? How do you interpret this value? (Hint: look at Sternberg (1966), middle of the third column on page 1).
8. For the regression model, give estimates for the intercept and slope (including confidence intervals similar to the way Sternberg (1966) presents them in the middle of the third column on page 1.
9. What do you think the intercept represents? What about the slope? (Hint: think about the cognitive processes that might be involved in "scanning" short term memory during the task)
10. Based on your visual inspection of the Sternberg plot, which type of processing did our subjects appear to use: parallel or serial? Why?
11. Fit a linear model expressing RT as a function of memory set size for the "Probe present" trials. Give a confidence interval for the slope in the way Sternberg (1966) does (e.g., estimator $\pm$ standard error).
12. Repeat the previous problem for the "Probe not present" trials.
13. Construct a plot of RT against memory set size showing (1) closed dots for the "Probe present" trials; (2) open dots for the "Probe not present" trials; (3) regression lines for each type of trial (be sure to make one of the lines solid and the other dashed).
14. We will now assess the stopping rule used in short term memory scanning. To do this, we will test whether the slopes obtained in exercises 11-13 are the same (exhaustive) or different (self-terminating). Fit a linear model expressing the difference in RTs between "probe present" and "probe not present" trials as a function of memory set size. Give a confidence interval for this slope. Based on this confidence interval, which stopping rule do our subjects appear to use? Why?