**Class 13- In Class Activity**

**Effect Size & Power**

*Submit what you have done by the end of class on Canvas. If you don’t finish in time, finish the rest on your own time (but you don’t need to submit it again).*

Dr. Miller conducts a study on if a reading program called STAR will increase test scores in 3rd graders. For the general population of 3rd graders, the average test score is 25 and the standard deviation is 12.

She will conduct a two-tailed test with *p*<.01 as her cutoff.

a) What are the two populations of interest? (remember to make the research hypothesis population Population 1and the generalpopulation Population 2)

Population 1: 3rd grade students using STAR

Population 2: 3rd graders

b) State the research hypothesis and null hypothesis (sentence & equation using μ1 and μ2).

Research hypothesis: μ1> μ2

Null hypothesis: μ1= μ2

c) Dr. Miller completes the study and gets a mean of 19. Solve for the effect size. Show your work.

19-25/12

-.5

Is this effect size small, medium, or large?

medium

d) Dr. Miller takes another sample from a different school district. This sample’s mean is 30. Solve for the effect size. Show your work.

30-25/12

.42

Is the effect size small, medium, or large?

This is small to medium

e) Define statistical power.

If Dr. Miller’s study has power of .78, what does that mean? Write a full sentence using the variables from this study.

This means that μ1 suggests an almost significant enough difference from μ2.

f) List 4 things Dr. Miller could do as a researcher to increase the power in her study. Make your answers relevant to this study.

- she could try using a different test 1 or 2 tailed

- change her hypothesis

- change her testing procedure

- try for a higher significance level

g) Dr. Miller finds 15 other research articles over the past 5 years testing the efficacy of the same STAR program. They use different reading assessments to test if the program worked, but luckily the researchers published effect sizes. She assigns her graduate students to conduct a meta-analysis on the studies. Why would they do this? What does a meta-analysis do?

This would determine the overall trends from the data.

h) In one of the other articles from the meta-analysis (Study A) *d* = .35, but the results were null (i.e. not significant, *p*>.05). In another article (Study B) the effect size was smaller (*d* = .27) but the results were significant (i.e. *p*<.05). What is one explanation for this? Does this mean that the effect in Study A definitely doesn’t exist?

This means that they could have different population sizes despite being all 3rd grade classes.