EPSY 5261 : Introductory Statistical Methods

Day 22
Standardized Effect Size

Learning Goals

- At the end of this lesson, you should be able to…

  - Explain what an effect size is

  - Explain why we use effect sizes

  - Compute effect sizes and their confidence intervals using R Studio

Effect Size

Using standardized effect sizes makes the difference between means or proportions more interpretable

Effect Size

- The *p*-value tells us the strength of evidence against a null hypothesis of no effect, or no difference (smaller *p*-value = stronger evidence against null hypothesis)

- The *p*-value does NOT tell us **how large the difference is** (or how strong the relationship is)

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Example Consideration

Example: SAT math prep course

- Suppose that students who took an SAT math prep course scored significantly higher than those who did not ($p < .0000001$).

- HOWEVER, suppose the 95% confidence interval for the difference in mean scores between those who took the course and those who did not was

- [2, 6] points (out of 800 total).

- Would you pay for the course?

Effect Size for Difference in Means

Cohen's d

$$d = \frac{x_1 - x_2}{s}$$

Where

$$s = \frac{s_1 + s_2}{2}$$

Effect size for Difference in Proportions

Cohen's h

$$h = 2arcsin(\sqrt{(p_1)}) - 2arcsin(\sqrt{(p_2)})$$

Exploring Effect Sizes Activity
(note this activity does not use real data)

Summary

- An effect size gives us a meaningful way to discuss difference in means or proportions