Statistics
Chapter Six

- Two-Sample t-Tests: used when the independent variable is low level (typically nominal) w/ two levels (two groups being compared on something) AND the dependent variable is high-level for which it is appropriate to calculate mean
  - → The null hypothesis is that the two group means are the same (i.e. independent & dependent variable are not related)
    - → $H_0: \mu_1 = \mu_2$
  - → The alternative hypothesis is that the two group means are different (independent & dependent variables are related)
    - → $H_1: \mu_1 \neq \mu_2$

- Standard Error of the Difference (SE_D): the standard error of the distribution

- Test for Assumptions
  - → Test for normality: Kolgomorov-Smirnov Test
  - → Test for equal variances: Levene's F test

- Types of T-tests
  - → there are three different formulas for computing a t statistic, all of which share a common goal of testing mean differences btwn two groups
  - → Independent groups t-test
    - → Pooled variance formula
    - → Seperate variance formula
  - → Dependent groups t-test

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- **Independent groups t-test:** used to test the difference btwn means for two unrelated groups
  - → People in the groups are not the same people and are not related in any systematic way
  - → Two tests can be done, decided by whether the variences are (close to) equal or significantly different

- **Pooled Varience Formula**
  - → Varience in two groups is essentially the same
  - → If calculated t ≥ tabled t the result is statistically significant and we reject null hypothesis
  - → The pooled varience formula can be used if the population variences are equal > tested w/ the Levene's test
    - → If the F from this test is significant, the pooled varience formula should NOT be used
    - → Significance is .05 or smaller (above .05 use the pooled varience formula)

- **Dependent Groups T-test:** used to test the difference btwn means for two related groups, or for the same people measured twice
  - → The people in two groups are systematically connected, which lowers variability (the SE_D)

- $t = \frac{\bar{X}_A - \bar{X}_B}{\sqrt{\frac{s_A^2}{n_A} + \frac{s_B^2}{n_B}}}$ → Gives upper & lower limit