

Lab Assignment #7  
One-Sample Hypothesis Testing for Means

**Research Question:** Do psychology majors express a different level of liking psychology, on average, than the general population?

Using the *likepsych* variable, where the **population is non-psychology majors** (i.e. “the general population”) who answered the survey question, and the **sample is psychology majors** who answered the survey question:

1. Give the **non-directional** (i.e. two-tailed):
  - a. Null hypothesis
  - b. Alternative hypothesis
  
2. Find (use SPSS – you need each of these terms to do part 3):
  - a.  $\mu$
  - b.  $\sigma$
  - c.  $\bar{x}$
  - d.  $s_x$
  - e.  $N$
  
3. Calculate, using  $\alpha=0.05$ :
  - a. the z-statistic (show your work)
    - i. critical value ( $z_{crit}$ , use an online calculator)
    - ii. 95% confidence interval around the sample mean ( $CI_z$ , show your work)
    - iii.p-value ( $p_z$ , use an online calculator)
  - b. the t-statistic (show your work)
    - i. degrees of freedom ( $df$ )
    - ii. critical value ( $t_{crit}$ , use an online calculator)
    - iii.95% confidence interval around the sample mean ( $CI_T$ , show your work)
    - iv.the p-value ( $p_T$ , use an online calculator)
  
4. How do the confidence intervals and p-values you calculated in part 3 compare between the z-test and the t-test? Why (or why not) do they differ?
  
5. Interpret your p-values in the context of the hypotheses you stated in part 1.
  
6. What is a confidence interval? What does it tell us?
  
7. Art time! Draw (by hand) the z-distribution and the overlapping approximately-appropriate-for-your- $df$  t-distribution (i.e. one picture, two curves). On your picture, mark and label (with the name and value) your:
  - a.  $z_{crit}$
  - b.  $z_{stat}$
  - c.  $t_{crit}$
  - d.  $t_{stat}$