# Psyc 2317 - Hw 7 Solutions

#1a) Let $\mu_1$ = pop. mean well-being score for those w/ 2 or fewer negative exp.

$\mu_2$ = pop. mean well-being score for those with 5–10 negative exp.

Define: $\mathcal{H}_0: \mu_1 = \mu_2$ and assume $\mathcal{H}_0$ is true.

$\mathcal{H}_1: \mu_1 \neq \mu_2$

Now we'll compute a t-score: $t = \dfrac{(\bar{X}_1 - \bar{X}_2) - (\mu_1 - \mu_2)}{\hat{\sigma}_p \sqrt{\frac{1}{N_1} + \frac{1}{N_2}}}$

Need to compute $\hat{\sigma}_p$:

$$\hat{\sigma}_p = \sqrt{\frac{SS_1 + SS_2}{df_1 + df_2}} = \sqrt{\frac{398 + 370}{17 + 15}} = \sqrt{\frac{768}{32}}$$

$$= \sqrt{24} = 4.900$$

So:

$$t = \frac{(42 - 48.6) - 0}{4.900\sqrt{\frac{1}{18} + \frac{1}{16}}}$$ since $\mathcal{H}_0$ is true

$$= \frac{-6.6}{1.684} = -3.92.$$

From table (df = 32), we have p = 0.002*

So we <u>reject</u> $\mathcal{H}_0$ and conclude that there is a sig. difference between the two populations

* because 2-tailed, we multply p = 0.001 by 2.

#1b

$$d = \frac{\bar{x}_1 - \bar{x}_2}{\hat{\sigma}_p} = \frac{42 - 48.6}{4.900} = \frac{-6.6}{4.9}$$

$$= -1.35$$

Note: is a large effect!

#2a Let $\mu_1$ = pop. mean estimate for "smashed into" group
$\mu_2$ = pop. mean estimate for "hit" group.

Define: $H_0: \mu_1 = \mu_2$ and assume $H_0$ is true.

$H_1: \mu_1 > \mu_2$

Compute $t = \dfrac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\hat{\sigma}_p \sqrt{\frac{1}{N_1} + \frac{1}{N_2}}}$

Note: $\hat{\sigma}_p = \sqrt{\dfrac{SS_1 + SS_2}{df_1 + df_2}} = \sqrt{\dfrac{510 + 414}{14 + 14}} = \sqrt{\dfrac{924}{28}} = \sqrt{33}$

$= 5.745$

So: $t = \dfrac{(40.8 - 34.0) - 0}{5.745\sqrt{\frac{1}{15} + \frac{1}{15}}} = \dfrac{6.8}{2.098} = 3.24$

From table ($df = 28$), we have $p = 0.001$. So, we reject $H_0$ and conclude that the "smashed into" group estimated speeds significantly higher than the "hit" group.

#2b

$$d = \frac{\bar{X}_1 - \bar{X}_2}{\hat{\sigma}_p} = \frac{40.8 - 34.0}{5.745} = 1.18$$

"large effect"