

Let's see if the correlation between hours of sleep and caffeine consumption differs by gender. From our class, the correlation between hours of sleep and caffeine consumption for the 122 women in this class is -0.13. For the 29 men, the correlation it is -0.15. Is this difference between correlations significant? We'll use $\alpha = 0.05$.

$$\begin{array}{l} \text{Women: } n_1 = 122, \quad r_1 = -0.13 \\ \text{Men: } n_2 = 29, \quad r_2 = -0.15 \end{array} \quad \alpha = 0.05, \text{ two-tailed.}$$

$$\begin{array}{l} \text{Fischer's } z'_1 \text{ for } r_1 = -0.13 \text{ is } -0.131 \\ z'_2 \text{ for } r_2 = -0.15 \text{ is } -0.151 \end{array}$$

$$\sigma_{z'_1 - z'_2} = \sqrt{\frac{1}{n_1 - 3} + \frac{1}{n_2 - 3}} = \sqrt{\frac{1}{122 - 3} + \frac{1}{29 - 3}} = 0.2165$$

$$z = \frac{z'_1 - z'_2}{\sigma_{z'_1 - z'_2}} = \frac{-0.131 - (-0.151)}{0.2165} = 0.0923$$

$$\text{area above } z = 0.0923 \text{ is } 0.4641$$

$$\text{two-tailed test, so double it: } p = 0.4641 \times 2 = 0.9282$$

Fail to reject H_0 :

The correlation between hours of sleep and caffeine consumption for women ($r = -0.13$) is not significantly different than for the men ($r = -0.15$), $z = 0.0923$, $p = 0.9282$