$$\text{Effect size } \eta 2 = \frac{\text{SSB}}{\text{SSB+SSW}}$$

$$\text{Effect size } \eta 2 = \frac{9524}{9524+10365} = 0.47$$

3b.

We usually say something is “statistically significant” if $p < 0.05$

P=0.004

N^2=0.47

$\eta^2 > 0.14$ indicates a **large** effect.

F-statistic:

$$\mathrm{F} = \frac{MSB}{MSW}$$

$$\frac{2381}{518.25} = 4.59$$

Finally

$$\mathrm{P} = \mathrm{P}(\mathrm{F}(4,20) > 4.59) = 0.0046$$

$SSW = \Sigma(X_j - X_i)$^2

Where

X_j denotes a group mean;

X_i denotes an individual observation in each group

$$10365 = (X_{i1} - X1)^2 + (X_{i2} - X1)^2 + \cdots + (X_{inj} - X5)^2$$

For n independent observations and m groups

$$dfW = n - m$$

$$25 - 5 = 20$$

$$MSW = \frac{SSW}{dfW}$$

$$\frac{10365}{20} = 518.25$$

3a.

SSB=9524 SSW=10365

$SSB = \Sigma n_j(X_j - X)_2$

$X_{\bar{j}}$ denotes a group mean;

X is the overall mean;

n_j is the sample size per group.

$9524 = 5(X_{j1} - X)^2 + 5(X_{j2} - X)^2 + 5(X_{j3} - X)^2$

For m groups

$dfB = m - 1$

$so\ dfB = 5 - 1 = 4$

$MSB = SSB/dfB$

$\frac{9524}{4} = 2381$