Terminology/Notation

- The independent variable is referred to as a factor
- The different groups are referred to as levels
- k is the number of levels in the study
- n is the number of participants per group
- N is the number of participants in the entire study

Mean Square Between Groups

- Between group variance
  - Mean square between groups

$$MS_{between} = \frac{SS_{between}}{df_{between}}$$

  - Degrees of freedom between groups
    - $df_{between} = k - 1$

Mean Square Within Groups

- Within group variance
  - Mean square within groups

$$MS_{within} = \frac{SS_{within}}{df_{within}}$$

  - Degrees of freedom within group
    - $df_{within} = N - k$

F-statistic

- The F-statistic is computed by

$$F = \frac{MS_{between}}{MS_{within}}$$

ANOVA Summary Table

Source	SS	df	MS	F
Between[1]	$SS_{Between}$	$df_{Between}$	$MS_{Between}$	F
Within[2]	SS_{Within}	df_{Within}	MS_{Within}	
Total	SS_{Total}	df_{Total}		

[1]In an actual summary table, the name of the IV is used to label the between group source of variance.

[2]Error is another term commonly used to label the within group source of variance.

ANOVA Summary Table

- The sum of squares are related by

$$SS_{total} = SS_{within} + SS_{between}$$

- The degrees of freedom are related by

$$df_{total} = df_{between} + df_{within}$$

Effect Size for ANOVA

- A commonly used effect size for ANOVA is

$$\eta^2 = \frac{SS_{between}}{SS_{total}}$$

- It is the proportion of variance in the DV that is accounted for by the IV