

Two-Way Between ANOVA

Individual data

Drug therapy	Psychotherapy	
	Present	Absent
Present	8	6
	9	4
	7	2
Absent	5	4
	4	2
	3	0

Mean scores

Drug therapy	Psychotherapy		Mean
	Present	Absent	
Present	\bar{X} 8 SD 1.0	\bar{X} 4 SD 2.0	\bar{X} 6.0 SD 2.4
Absent	\bar{X} 4 SD 1.0	\bar{X} 2 SD 2.0	\bar{X} 3.0 SD 2.1
Mean	\bar{X} 6.0 SD 2.6	\bar{X} 3.0 SD 1.8	Mean total: 4.5

Two-Way Between ANOVA

Computations

Sums of squares

Degrees of freedom

$$\text{Total SS} = \sum (X - \bar{X}_{\text{total}})^2$$

where X : single score

of scores - 1

Overall

$$\text{Between-conditions SS} = \sum [n_k (\bar{X}_k - \bar{X}_{\text{total}})^2]$$

of conditions - 1

where k is one condition
and n_k is the # of subjects in a given condition

$$\text{Drug Therapy SS} = [n (\bar{X}_{\text{row}} - \bar{X}_{\text{total}})^2]$$

of Drug Therapy - 1

where n is the # of subjects in Drug Therapy

$$\text{Psychotherapy SS} = [n (\bar{X}_{\text{column}} - \bar{X}_{\text{total}})^2]$$

of Psychotherapy - 1

where n is the # of subjects in Psychotherapy

$$\text{Interaction SS} =$$

(# of Drug Therapy - 1) X

$$\text{Between SS} - \text{Drug Therapy SS} - \text{Psychotherapy SS}$$

(# of Psychotherapy - 1)

$$\text{Within-conditions SS} = \sum_k [k (\bar{X}_k - \bar{X}_{\text{total}})^2]$$

where k is one condition

$k(n_k - 1)$

Table of variance:

Source	SS	df	MS	F	p
Between subjects	57	3	19.0		
Drug Therapy	27	1	27.0	10.80	0.0111
Psychotherapy	27	1	27.0	10.80	0.0111
Interaction	3	1	3.0	1.20	0.3052
Within conditions	20	8	2.5		
Total	77	11			