Tabla de Totales

	$Y_{ij.}$			$Y_{i..}$
	b_1	b_2	b_3	
a_1	211.1	194.6	179.5	585.20 $Y_{1..}$
a_2	202.0	179.2	202.4	583.6 $Y_{2..}$
$Y_{.j.}$	413.1	373.8	381.9	$Y_{...} = 1168.8$

$Y_{.1.}$ $Y_{.2.}$ $Y_{.3.}$

Tabla de Promedios

	$\bar{Y}_{ij.}$			$\bar{Y}_{i..}$
	b_1	b_2	b_3	
a_1	52.775	48.650	44.875	48.76
a_2	50.500	44.800	50.600	48.633
$\bar{Y}_{.j.}$	51.6375	46.725	47.7375	$\bar{Y}_{...} = 48.7$

585.20 /12
48.76666666

583.6 /12
48.6333333

413.1 /8
51.6375

373.8 /8
46.725

381.9 /8
47.7375

1168.8 /24
48.69999999

$$\begin{cases} H_0 : (\alpha\beta)_{ij} = 0 \quad \times \\ H_1 : (\alpha\beta)_{ij} \neq 0 \quad \checkmark \end{cases}$$

Cuadro ANVA

F.V.	GL	SC	CM	Fc
A	p-1=1	0.1067	0.1067	0.0083
B	q-1=2	107.6475	53.8238	4.1641
AB	(p-1)(q-1) = 2	105.4408	52.7204	4.0787 (*)
Error Exp.	pq(r-1) = 18	232.665	12.9258	
Total	pqr-1 = 23	445.86		

*** RHo

Efectos Simples

$$A b_j \begin{cases} A b_1 \\ A b_2 \\ A b_3 \end{cases} ; \forall j = 1,2,3$$

$$B a_i \begin{cases} B a_1 \\ B a_2 \end{cases} ; \forall i = 1,2$$

$$\text{A}\,\text{b}\,\text{j} \begin{cases} \to \text{A}\,\text{b}_1 \\ \to \text{A}\,\text{b}_2 \\ \to \text{A}\,\text{b}_3 \end{cases}$$
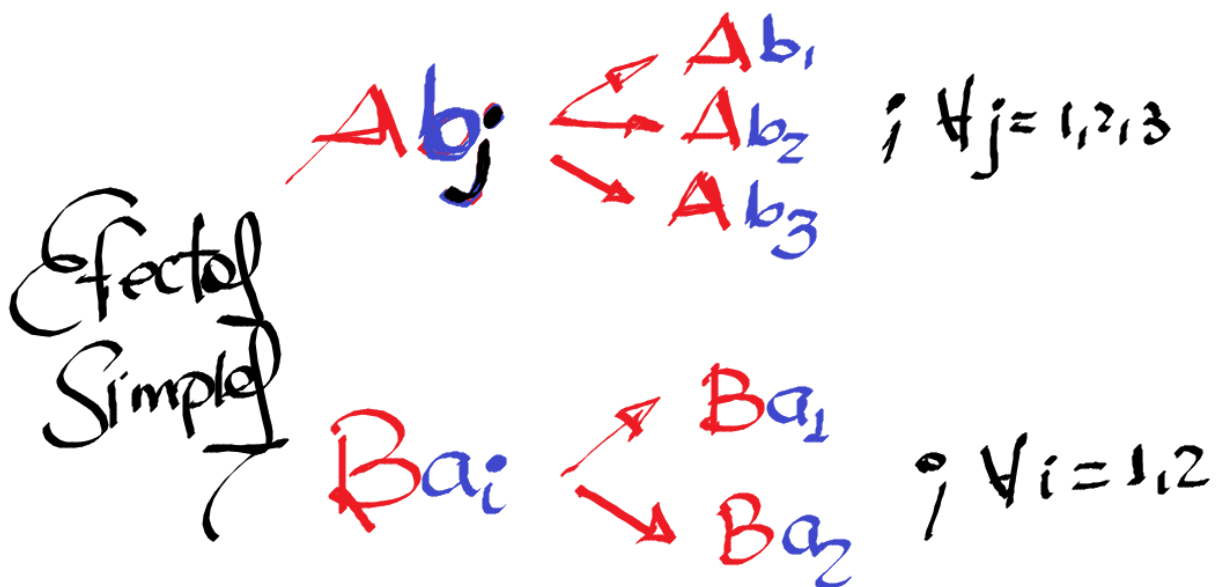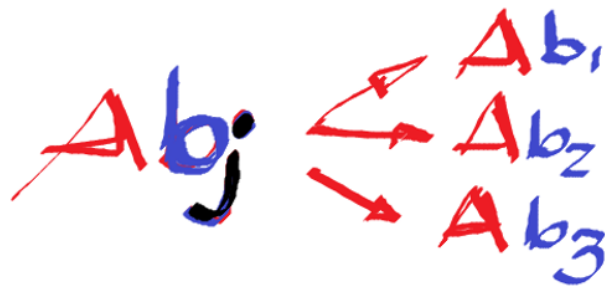
Hipótesis

$$\begin{cases} H_0 : \mu_{1j.} = \mu_{2j.} = \ldots = \mu_{pj.} \\ H_1 : \text{Al menos un } \mu_{ij.} \text{ es diferente.} \end{cases}$$

Sumas de cuadrados

$$SC\left(Ab_j\right) = \sum_{i=1}^{p} \frac{Y_{ij.}^2}{r} - \frac{Y_{.j.}^2}{pr}$$

$$\forall i = 1, 2, \ldots, p = 2$$

Donde:
- $Y_{ij.}$: Tabla de totales.
- $Y_{.j.}$: Σ de columna r
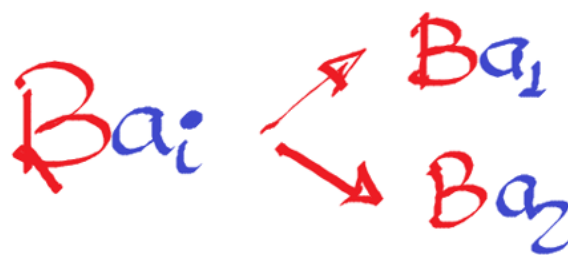

$$SC\left(Ab_1\right) = \sum_{i=1}^{p} \frac{Y_{i1.}^2}{r} - \frac{Y_{1.}^2}{pr} = \frac{211.1^2 + 202^2}{4} - \frac{413.1^2}{2 \times 4} =$$

$$SC\left(Ab_2\right) = \sum_{i=1}^{p} \frac{Y_{i2.}^2}{r} - \frac{Y_{2.}^2}{pr} = \frac{194.6^2 + 179.2^2}{4} - \frac{373.8^2}{2 \times 4} =$$

$$SC\left(Ab_3\right) = \sum_{i=1}^{p} \frac{Y_{i3.}^2}{r} - \frac{Y_{3.}^2}{pr} = \frac{179.5^2 + 202.4^2}{4} - \frac{381.9^2}{2 \times 4}$$

	b_1	b_2	b_3	$Y_{i..}$
a_1	211.1	194.6	179.5	585.20
a_2	202.0	179.2	202.4	583.6
$Y_{.j.}$	413.1	373.8	381.9	$Y_{...} = 1168.8$

(annotations: $Y_{i1.}$, $Y_{i2.}$, $Y_{i3.}$ above columns; $Y_{.1.}$, $Y_{.2.}$, $Y_{.3.}$ below columns)

$$Ba_i \longrightarrow \begin{cases} Ba_1 \\ Ba_2 \end{cases}$$

2. Para el efecto simple de B en el nivel i de A

Hipótesis

$H_0 : \mu_{i1.} = \mu_{i2.} = \ldots = \mu_{iq.}$

$H_1 :$ Al menos un $\mu_{ij.}$ es diferente.

Sumas de cuadrados

$$SC\left(Ba_i\right) = \sum_{j=1}^{q} \frac{Y_{ij.}^2}{r} - \frac{Y_{i..}^2}{qr}$$

$$SC(Ba_1) = \sum_{j=1}^{q} \frac{Y_{1j.}^2}{r} - \frac{Y_{1..}^2}{qr} = \frac{211.1^2 + 194.6^2 + 179.5^2}{4} - \frac{585.2^2}{3 \times 4}$$

$$SC(Ba_2) = \sum_{j=1}^{q} \frac{Y_{2j.}^2}{r} - \frac{Y_{2..}^2}{qr} = \frac{202^2 + 179.2^2 + 202.4^2}{4} - \frac{583.6^2}{3 \times 4} :$$

	b_1	b_2	b_3	$Y_{i..}$
a_1	211.1	194.6	179.5	585.20
a_2	202.0	179.2	202.4	583.6
$Y_{.j.}$	413.1	373.8	381.9	$Y_{...} = 1168.8$

Pruebas de hipótesis para los efectos simples

1. Planteamiento de hipótesis

A en $b_1 : H_0 : \mu_{11.} = \mu_{21.}$ A en $b_2 : H_0 : \mu_{12.} = \mu_{22.}$ A en $b_3 : H_0 : \mu_{13.} = \mu_{23.}$

       $H_1 : \mu_{11.} \neq \mu_{21.}$ $H_1 : \mu_{11.} \neq \mu_{22.}$ $H_1 : \mu_{13.} \neq \mu_{23.}$

B en $a_1 : H_0 : \mu_{11.} = \mu_{12.} = \mu_{13.}$ B en $a_2 : H_0 : \mu_{21.} = \mu_{22.} = \mu_{23.}$

       $H_1 :$ Al menos un $\mu_{1j.}$ es $\neq$ $\forall j = 1, 2, 3$ $H_1 :$ Al menos un $\mu_{2j.}$ es $\neq \forall j = 1, 2, 3$

Analiza chucho?

Cuadro ANVA de efectos simples

F.V	GL	SC	CM	Fc	Ftab
✗ Ab_1	p-1=1	10.35125	10.35125	0.8008 (NS)	$F(0.95, 1, 18) = 4.41$
✗ Ab_2	p-1=1	29.64500	29.64500	2.2935 (NS)	$F(0.95, 1, 18) = 4.41$
✓ Ab_3	p-1=1	65.55125	65.55125	5.0713 (*)	$F(0.95, 1, 18) = 4.41$
✓ Ba_1	q-1=2	124.90167	62.45084	4.8315 (*)	$F(0.95, 2, 18) = 3.55$
✗ Ba_2	q-1=2	88.18667	44.09334	3.4113 (NS)	$F(0.95, 2, 18) = 3.55$
Error Exp.	pq(r-1)=18	232.665	12.9258		

A en $b_3 : H_0 : \mu_{13.} = \mu_{23.}$ B en $a_1 : H_0 : \mu_{11.} = \mu_{12.} = \mu_{13.}$

                 $H_1 :$ Al menos un $\mu_{1i.}$ es $\neq$ $\forall j = 1, 2, 3$

✓ 44.875	$H_1 : \mu_{13.} \neq \mu_{23.}$

✓ 52.775	✓ 48.650	✓ 44.875

✓ 50.600