

	Easy	Medium	Hard
Drug	15	20	25
Placebo	5	10	15

$$Y_{ijk} \sim \mu + \alpha_i + \beta_j + \gamma_{ij} + \epsilon_{ijk}$$

$$i=1, 2 \quad j=1, 2, 3$$

$\epsilon_{ijk} \sim N(0, \sigma^2)$
independently

$$\hat{\mu} = Y_{...} = 15$$

$$\hat{\alpha}_i = Y_{i..} - Y_{...}$$

$$\hat{\alpha}_1 = 20 - 15 = 5$$

$$\hat{\alpha}_2 = -5$$

$$\hat{\gamma}_{11} = 15 - 20 - 10 + 15 = 0$$

$$\hat{\gamma}_{21} = 0$$

$$\hat{\beta}_j = Y_{.j.} - Y_{...}$$

$$\hat{\gamma}_{ij} = Y_{ij.} - Y_{i..} - Y_{.j.} + Y_{...}$$

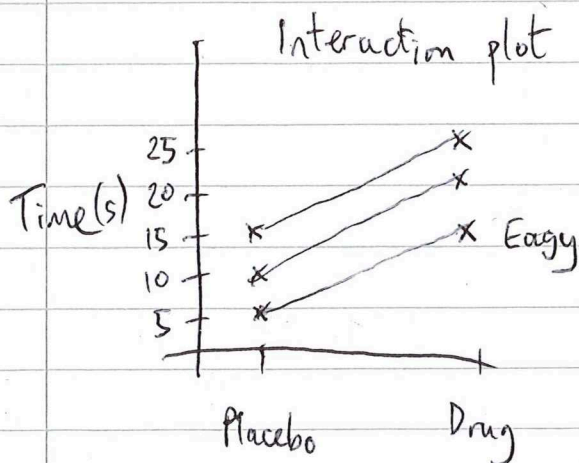
$$\hat{\beta}_1 = 10 - 15 = -5$$

$$\hat{\beta}_2 = 15 - 15 = 0$$

$$\hat{\beta}_3 = 20 - 15 = 5$$

$$\hat{\gamma}_{12} = 20 - 20 - 15 + 15 = 0 = \hat{\gamma}_{13}$$

$$\hat{\gamma}_{22} = 0 = \hat{\gamma}_{23}$$



Parallel (or nearly parallel) lines indicate no significant interaction.

	Male	Female
Drug	25	15
Placebo	5	15

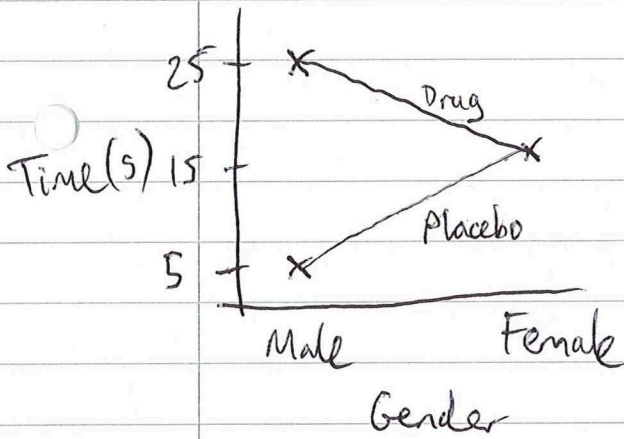
$$\hat{\mu} = 15$$

$$\hat{\alpha}_1 = 20 - 15 = 5$$

$$\hat{\alpha}_2 = -5$$

$$\hat{\beta}_1 = 15 - 15 = 0$$

$$\hat{\beta}_2 = 0$$



$$\hat{\delta}_{11} = Y_{110} - Y_{100} - Y_{010} + Y_{000}$$

$$= 25 - 20 - 15 + 15$$

$$= 5$$

$$\hat{\delta}_{12} = -5$$

$$\hat{\delta}_{21} = -5$$

$$\hat{\delta}_{22} = 5$$

