Chapter 13

• A contrast

$$w = \sum_{i=1}^{k} c_i \mu_i$$

where $\sum_{i=1}^{k} c_i = 0$. Many hypotheses about μ-s can be formulated as

$$H_0 : w = 0 \quad H_1 : w \neq 0.$$

Test: if

$$\frac{(\sum_{i=1}^{k} c_i \bar{Y}_i)^2}{S_p^2 \sum_{i=1}^{k}(c_i^2/n_i)} \geq f_{\alpha,1,N-k},$$

then H_0 is rejected.

• Multiple comparisons. Tukey's test. $n_1 = n_2 = ... = n_k = n$. Testing simultaneously $H_0 : \mu_i = \mu_j$ for all $i \neq j$. Denote

$$I_{ij} = \left[\bar{Y}_{i.} - \bar{Y}_{j.} - q(\alpha, k, N-k)\frac{S}{\sqrt{n}}, \bar{Y}_{i.} - \bar{Y}_{j.} + q(\alpha, k, N-k)\frac{S}{\sqrt{n}} \right].$$

If $0 \notin I_{ij}$, then $H_0 : \mu_i = \mu_j$ is rejected.