

ANOVA

1) $H_0: \mu_1 = \dots = \mu_k$

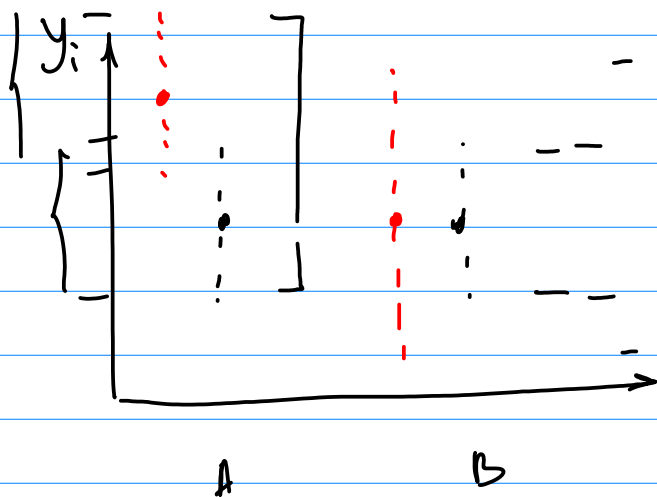
H_a : At least one is different

Assumptions:

1) y_i - iid, normality, outliers
continuous

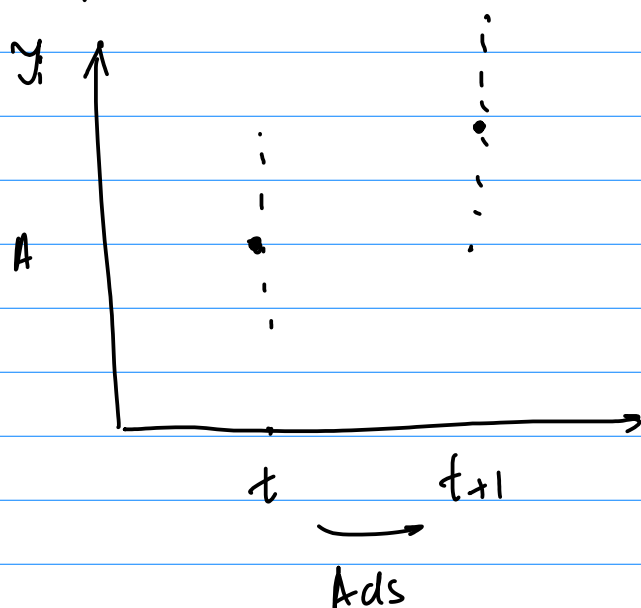
2) Sphericity = Homogeneity of variances

$H_0: \sigma_1^2 = \dots = \sigma_k^2$



2)

Repeated Measures ANOVA



Assumptions:

- 1) Y_i - iid, normality, no outliers
- 2) Sphericity

$$H_0: \mu_1 = \dots = \mu_m$$

H_a : at least one is different

$$y_{ij} = \mu + \alpha_i + b_j(t_i) + \epsilon_{ij}$$

t_i - time points $i = 1, \dots, m$

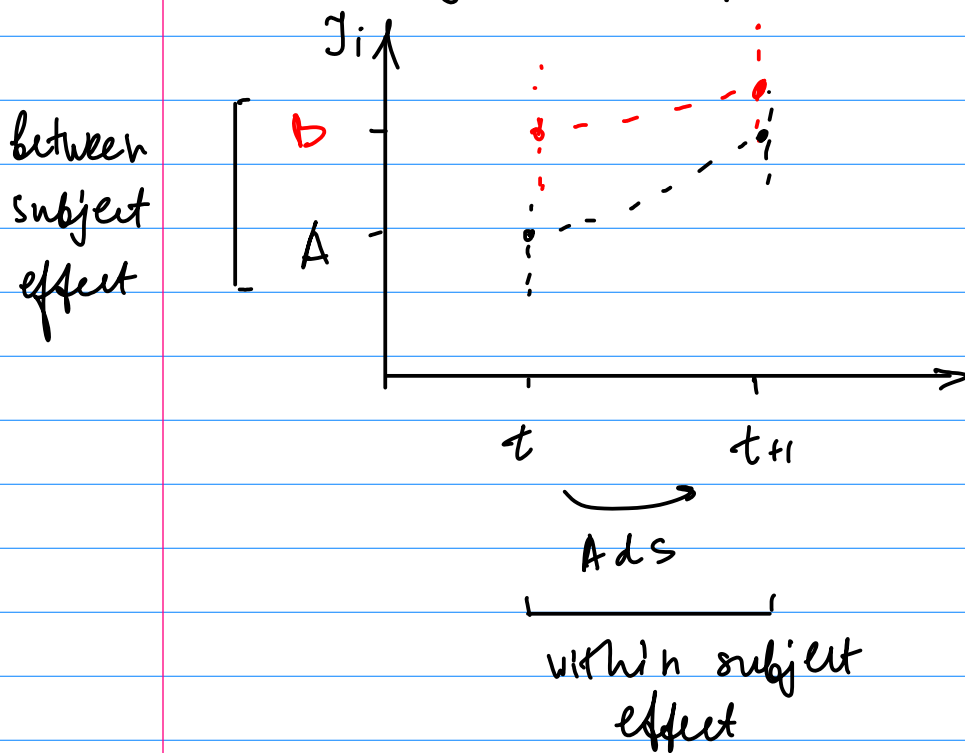
$\mu + \alpha_i$ - mean trend

$j = 1, \dots, J$ - individuals

$b_j(t_i)$ - individual effect j of person at t_i

$$\epsilon_{ij} \sim N(0, \sigma^2) \leftarrow$$

3) Two-way Mixed



1) $y_i - iid$

2) $y_i - \underline{\text{normal}}$, each combination of between-subject and within-subject variable

3) Sphericity - homogeneity for within-subject factor

4) Homogeneity of covariance matrix

ANCOVA (Analysis of covariances)

$$y_{ij} = \mu + \alpha_j + \beta \cdot z_{ij} + \epsilon_{ij}$$

μ - grand mean

α_j - factor for group j

z_{ij} - covariate

Assumptions:

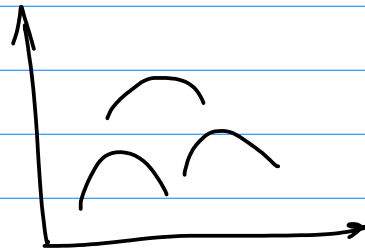
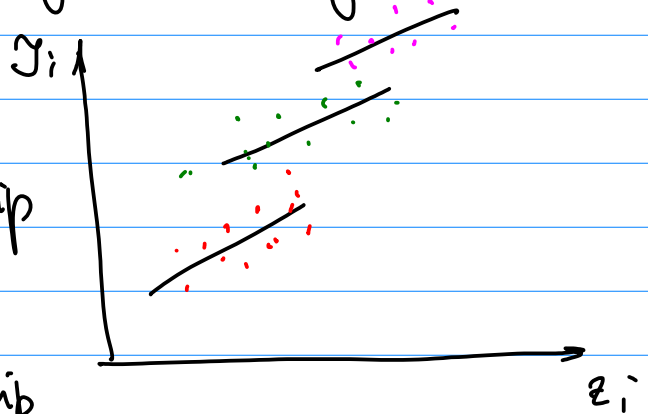
1) ANOVA model (sphericity, normality, independence)

2) Linearity:

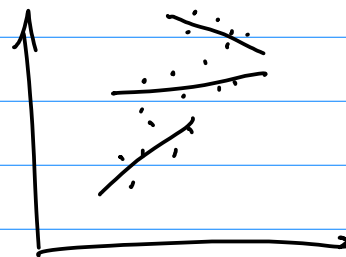
A1) linear relationship between y and z

A2) linear relationship within each group

A3) homogeneity of regression slopes



(A1) is violated



(A3) is violated