

# ANOVA and Repeated Measurements

## The most commonly used Stata commands

### anova

- Oneway ANOVA: `anova y grp`
- Twoway ANOVA: `anova y grp##envir`
- Univariate repeated measurements: `anova y grp/id time time#grp, bse(id) repeated(time)`
- Cross-over designs: `anova y order /id day grp /id|day time grp#time, bse(id#day) repeated(time)`

### contrast

- Estimate treatment effects (for example for each time point after `mixed`): `contrast treat@time, eff`

### dotplot

- Scatter plot of the data: `dotplot y, over(grp)`

### ellip

- Draw confidence ellipses: `ellip y z, by(grp) constant(t2)`

### estimates store

- Store estimates from model (after for example `mixed`): `estimates store model1`

### hotelling

- Multivariate t-test: `hotelling y z, by(grp)`

### lincom

- Linear combinations of estimates (after for example `mixed`): `lincom 1.grp#0.time - 2.grp#0.time`

### lrtest

- Comparing models with a likelihood ratio test (after `estimates store`): `lrtest model1 model2`

### margins

- Marginal estimates (after for example `mixed`): `margins time#group`

### marginsplot

- Plot of marginal estimates (after `margins`): `marginsplot, xdimension(time)`

### mixed

- Univariate repeated measurements: `mixed y bn.time#bn.grp || id:`
- Multivariate repeated measurements: `xi: mixed y bn.time#bn.grp || id: i.time, cov(un)`
- Random coefficient model: `mixed y bn.time#bn.grp || id: time, cov(un)`

#### mvtest

- Multivariate mean test: `mvtest mean y01 y12 y23, by(grp)`
- Multivariate sd and correlation test: `mvtest covariances y01 y12 y23, by(grp)`

#### oneway

- Oneway ANOVA: `oneway y grp`

#### predict

- Obtain predictions and residuals (after for example `anova`): `predict fit, xb` and `predict res, rstandard`

#### pwcompare

- Pairwise comparisons (after for example `mixed`): `pwcompare time#grp, eff`

#### pwcorr

- Pairwise correlations: `bysort grp: pwcorr y0 y1 y2 y3 y4`

#### qnorm

- QQ-plot (after `predict`): `qnorm res`

#### reshape

- Data from wide to long format: `reshape long y, i(id) j(time)`
- Data from long to wide format: `reshape wide y, i(id) j(time)`

#### test

- Test hypothesis after estimation (after for example `mixed`): `test 1.grp#c.time = 2.grp#c.time = 3.grp#c.time`

#### twoway

- Scatter plot: `twoway (scatter y x)`
- Plot of functional relationship: `twoway (function y=x)`
- Scatter plot with connected points: `twoway (connected y x)`
- Scatter plot with best fitted line: `twoway (scatter y x) (lfit y x)`