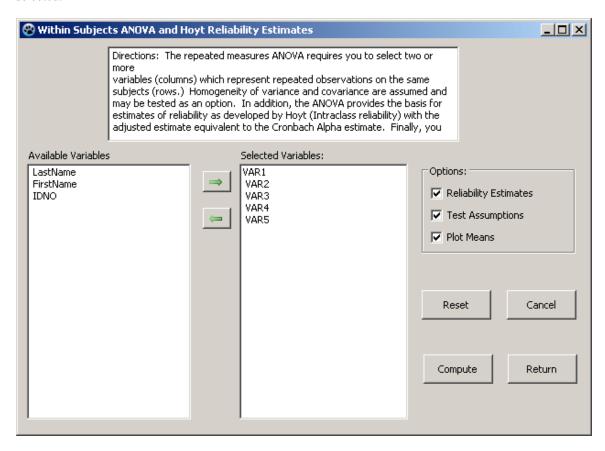
# Within Subjects Analysis of Variance

Multiple independent treatments may be administered to the same subjects. This design offers the advantage of lower errors by not introducing between group errors. We will use the file labeled itemdata.LAZ to demonstrate. Test items administered to subjects are essentially independent measures of the knowledge the subjects have for a certain topic. As such the analysis of variance for these repeated measures also serves as a basis for estimating the test reliability. The theory of this method was initially developed by Hoyt. Here then is the form that appears to complete the analysis. Note the options we have selected.



When we press the Compute button we obtain:

Treatments by Subjects (AxS) ANOVA Results.

Data File = C:\lazarus\Projects\LazStats\itemdat.LAZ

SOURCE	DF	SS	MS	F Prob. > F
SUBJECTS WITHIN SUBJECTS TREATMENTS RESIDUAL	15 64 4 60	13.200	0.423 0.206 0.763 0.169	4.507 0.003
TOTAL	79	19.550	0.247	

## TREATMENT (COLUMN) MEANS AND STANDARD DEVIATIONS

VARIABLE MEAN STD.DEV.

VAR1 0.875 0.342 VAR2 0.688 0.479 0.563 0.512 0.438 0.512 VAR3 VAR4 VAR5 0.313 0.479

Mean of all scores = 0.575 with standard deviation = 0.497

## RELIABILITY ESTIMATES

TYPE OF ESTIMATE VALUE Unadjusted total reliability 0.513 Unadjusted item reliability 0.174 Adjusted total (Cronbach) 0.600 Adjusted item reliability 0.231

BOX TEST FOR HOMOGENEITY OF VARIANCE-COVARIANCE MATRIX

SAMPLE COVARIANCE MATRIX with 16 cases.

Variables					
	VAR1	VAR2	VAR3	VAR4	VAR5
VAR1	0.117	0.025	0.008	-0.008	0.042
VAR2	0.025	0.229	0.121	0.079	0.037
VAR3	0.008	0.121	0.263	0.071	0.079
VAR4	-0.008	0.079	0.071	0.263	0.054
VAR5	0.042	0.037	0.079	0.054	0.229

## ASSUMED POP. COVARIANCE MATRIX with 16 cases.

### Variables

arrabics					
	VAR1	VAR2	VAR3	VAR4	VAR5
VAR1	0.220	0.011	0.011	0.011	0.011
VAR2	0.048	0.219	0.010	0.010	0.010
VAR3	0.048	0.046	0.219	0.010	0.010
VAR4	0.048	0.046	0.044	0.219	0.009
VAR5	0.048	0.046	0.044	0.042	0.218

Determinant of variance-covariance matrix = Determinant of homogeneity matrix = ChiSquare = 56.769 with 13 degrees of freedom Probability of larger chisquare = 6.96E-007

