ELSS612
S3L5

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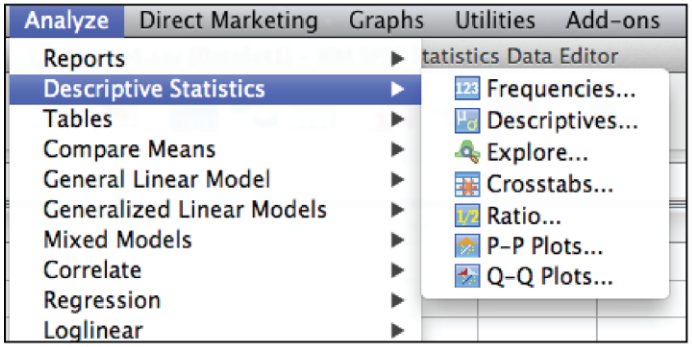
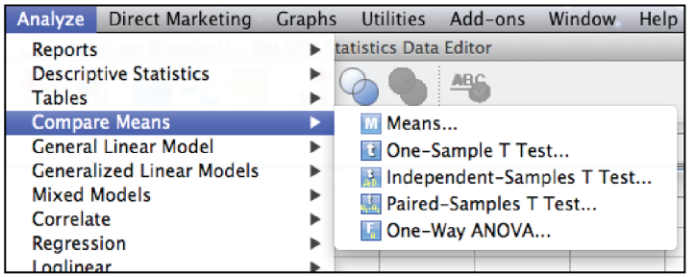
Basic statistics

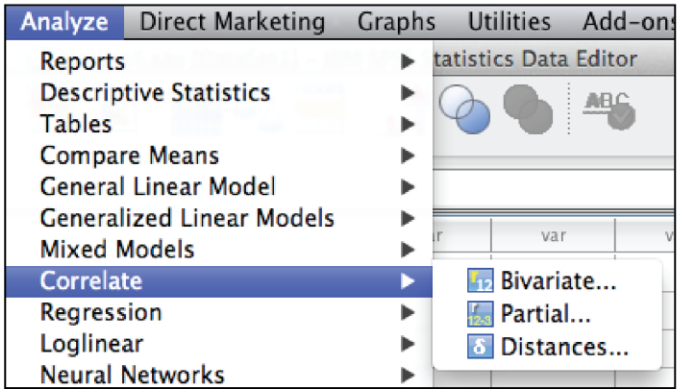
Basic method options



"Frequencies" provides frequency tables and descriptive statistics, "Descriptives" is suitable for scales, includes a z-score option. "Explore" is used for distribution testings and box-plots. "Crosstabs" is for nominal scales (≥2), includes a chi square test and many other options.



"Means" offers a possibility to compare groups and get various descriptive statistics. "One sample T Test" is used for comparing sample mean to the criterion. "Independent-Samples T Test" is used for comparing two separate groups. "Paired-Samples T Test" is used for comparing two variables from the same people (e.g. time1 and time2). One-Way ANOVA is used for comparing 3 or more groups.



"Bivariate" correlations is used for linear relationship testings between two scale variables. Pearson's correlation coefficient r is for normal distributions and Spearman's rho is for non-normal distributions of the variables.

Two independent groups

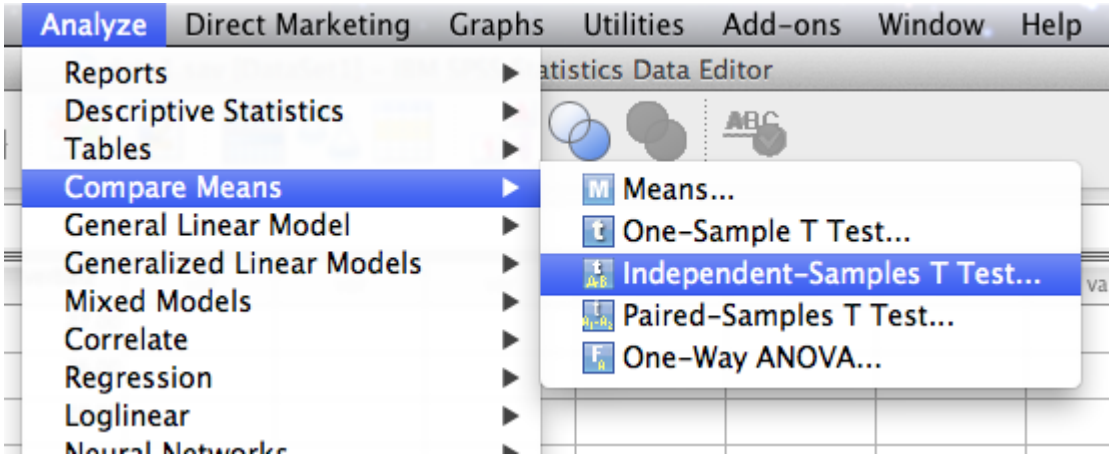
- Dependent variable is a scale (SPSS terminology)
- Independent variable has 2 values (e.g. boys vs. girls)
- T-test (normal distribution)
- Mann-Whitney U-test (non-normal distribution or a small number of participants)

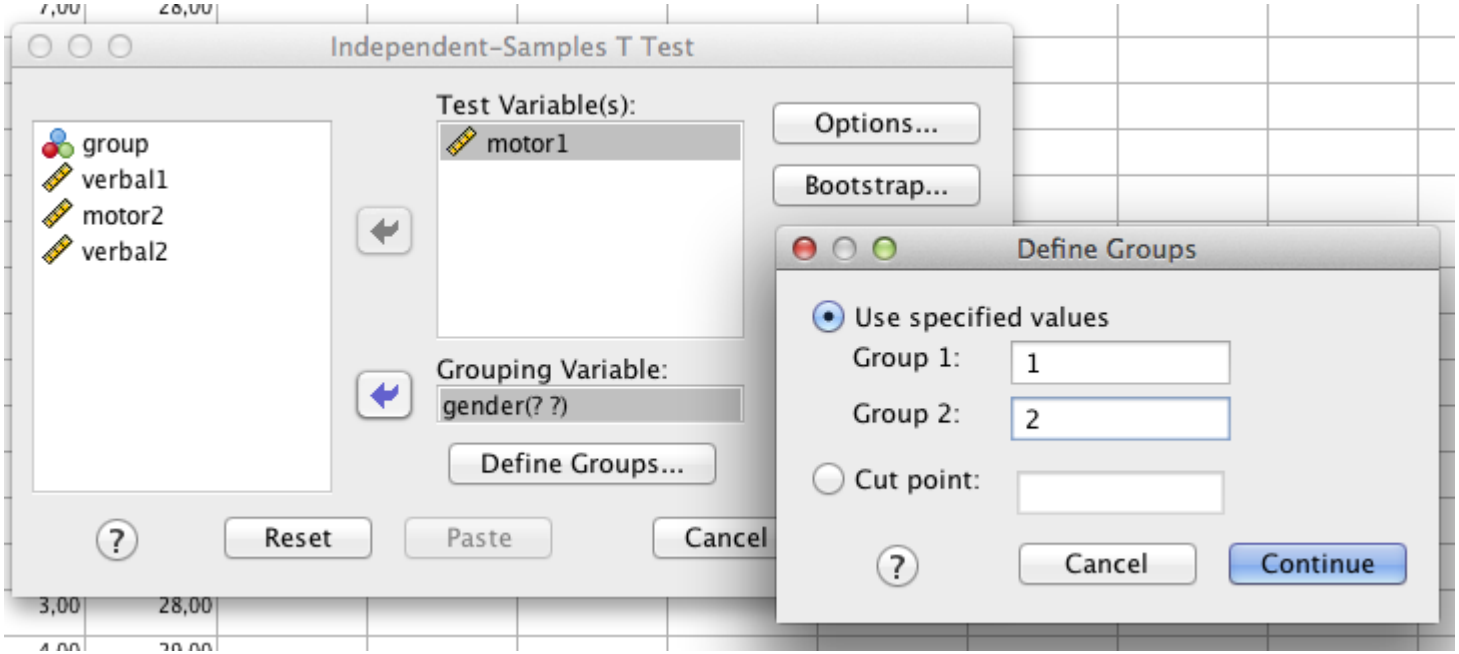
T-test

$$t = \frac{M_1 - M_2}{\sqrt{\left(\frac{(N_1 - 1)s_1^2 + (N_2 - 1)s_2^2}{N_1 + N_2 - 2}\right)\left(\frac{1}{N_1} + \frac{1}{N_2}\right)}}$$

M_1=mean of group 1
M_2=mean of group 2
s_1=standard deviation of group 1
s_2=mean of group 2
N_1=number of participants of group 1
N_2=number of participants of group 2

T-test





T-test

T-Test

[DataSet1] /Users/markkuleskinen/Dropbox/data1.sav

Group Statistics

	gender	N	Mean	Std. Deviation	Std. Error Mean
motor1	boys	11	3,2727	,90453	,27273
	girls	9	3,3333	1,00000	,33333

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
motor1	Equal variances assumed	,057	,814	-,142	18	,888	-,06061	,42616	-,95594	,83473
	Equal variances not assumed			-,141	16,412	,890	-,06061	,43069	-,97176	,85055

STEP 2: t(18)=-0.14, p=.888

Decision: No difference between boys and girls

STEP 1

If Levene's test p<.05, then we read row "equal variances not assumed".

T-test

Table 2. The differences between female leaders and male leaders in their rating of their leadership effectiveness.

Leadership Effectiveness	Gender	Means	Std. Deviations	t	*p*
Skills Overall	M	3.85	.61		
	F	3.57	.57	1.18	.25
Competencies Overall	M	3.80	.56		
	F	3.55	.62	1.04	.30
Leadership Effectiveness	M	3.71	.55		
	F	3.46	.58	1.09	.28

Standard deviation could be higher than 1, therefore it is recommended to report zero (e.g. 0.61).

It is recommended to report p-value by a 3 decimal accuracy.

T-test

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MANAGEMENT PHILOSOPHIES OF PRIMARY SCHOOL PRINCIPALS

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Table 1

T-test values relating to mean responses provided by teachers to premises on the management philosophy of their principals

Groups	Means	SD	t	p
X theory assertions	2.67	.91	11.03	.000*
Y theory assertions	3.81	.62		

*p<.05