

ANOVA



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Webinar

ANOVA with Statistics for Data Analysis

Statistics for Data Analysis

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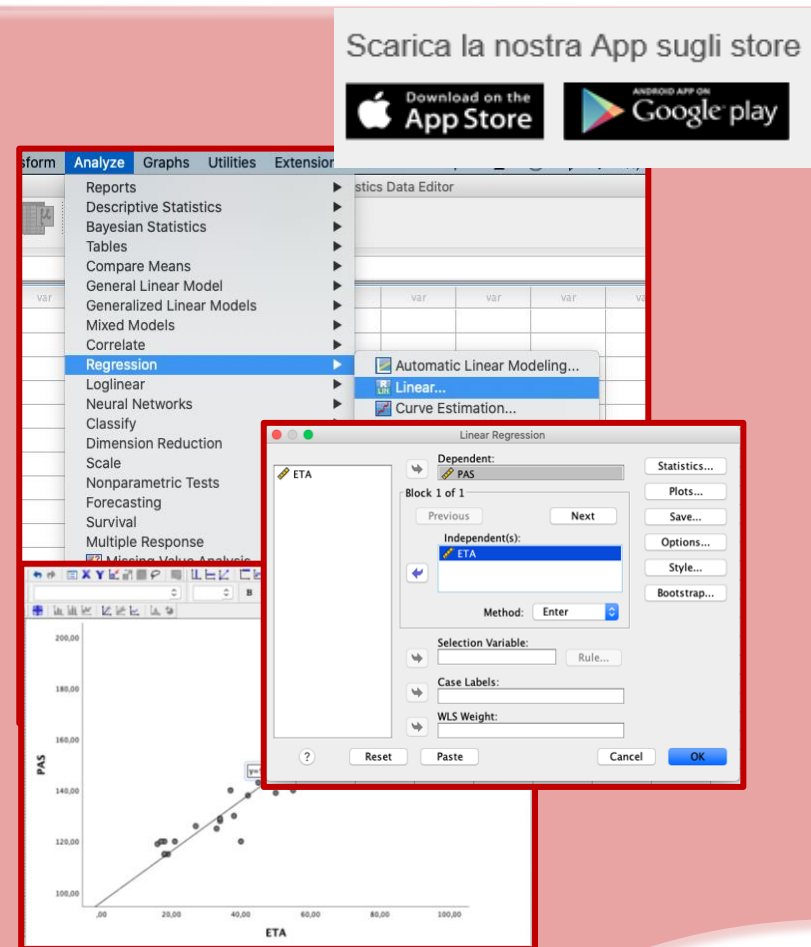
ANOVA with Statistics for Data Analysis

- Introduction
- Statistical inference
- Example
- Q&A

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The screenshot displays the SPSS software interface. The 'Analyze' menu is open, showing options like Reports, Descriptive Statistics, Bayesian Statistics, Tables, Compare Means, General Linear Model, Generalized Linear Models, Mixed Models, Correlate, Regression, Loglinear, Neural Networks, Classify, Dimension Reduction, Scale, Nonparametric Tests, Forecasting, Survival, Multiple Response, and Missing Value Analysis. The 'Regression' option is selected, and the 'Linear...' option is highlighted. The 'Linear Regression' dialog box is open, showing 'Dependent:' as 'PAS' and 'Independent(s):' as 'ETA'. The 'Method:' is set to 'Enter'. The 'Selection Variable:' is empty. The 'Case Labels:' and 'WLS Weight:' fields are also empty. The 'Statistics...' button is highlighted. In the background, a scatter plot of 'PAS' (Y-axis) versus 'ETA' (X-axis) is visible, showing a positive linear correlation with a regression line.

Statistics for Data Analysis

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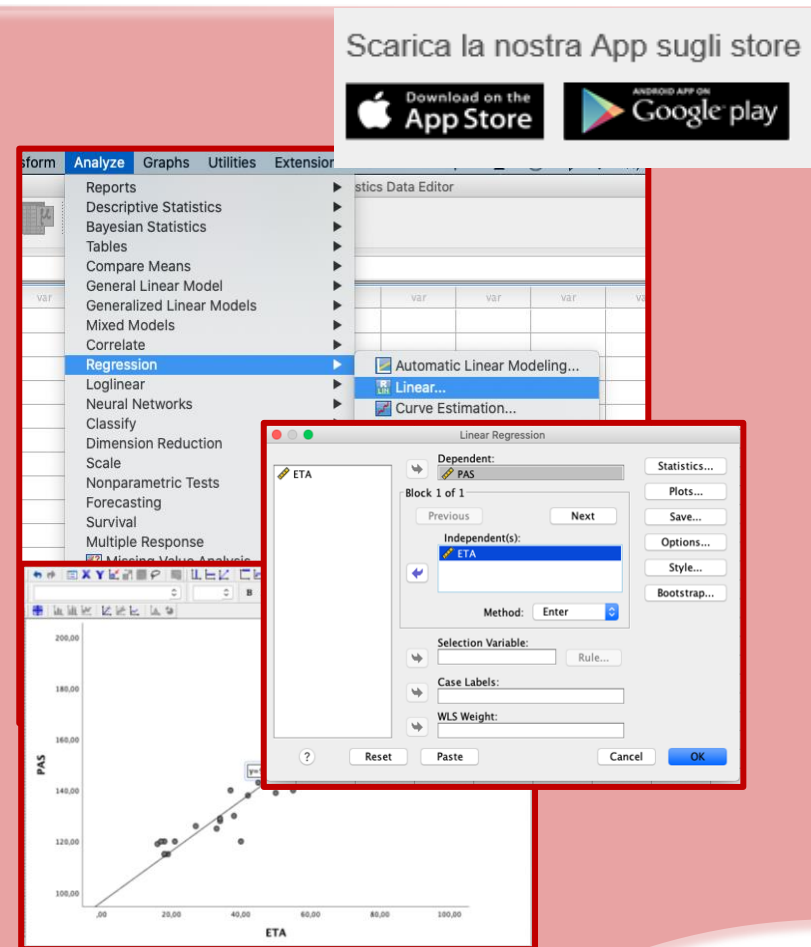
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Statistics world-wide dashboard with information on how to install various releases, stand-alone solutions and more

Dashboard

Add-On

Additional Tools

User manuals



Statistics for
Data Analysis

Language

Contact us

Launch Statistics for Data Analysis V. 28.0 New version available! (28.0.1.1) x Launch

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[Statistics for Data Analysis powered by SPSS](#) is a statistical analysis solution that cover the entire analysis cycle.

[Explore the packages](#) that best suits your needs, according to your activity area.

In continuation of the development path of the Statistics for Data Analysis solution, the SPS team extends the range of **services included in**, providing its customers with an entire **Reserved Area** where you can "**consult or send us methodological questions**" on the use of Statistics for Data Analysis.

[Explore the Premium Module PScore](#) for the **Propensity Score Matching technique** useful when data come from non-randomised studies, e.g. from registers or medical records

[Explore what is new in the latest version 28: Meta Analysis, Power Analysis enhancements, Ratio Statistics](#) and more.

[Explore the On-Line Training](#), which are designed to maintain a relationship and discussion with the trainer.

In fact, these are **live courses**, albeit remotely, **in which a theoretical part is supported by practice**, allowing all participants to have moments of exchange dedicated to the topics covered in each course.

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Self-installing add-ons:

additional features developed by SPS that strengthen the Statistics for Data Analysis solution, already available natively in the dedicated menus

Statistics for Data Analysis (LaunchBox v1.2.0.0)

Dashboard

> Add-On

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Installed Add-Ons



DuplicateCases



SplitStrings



AddDays



Tables for multiple-choice sets



Contingency tables



RSVP Chart



LadderPlot



File division



Text Extraction



String deduplication



Keep Information



Replace Outliers



Add 60 days



Split random files



Exclude Outliers



Remove Duplicates



Case Validation

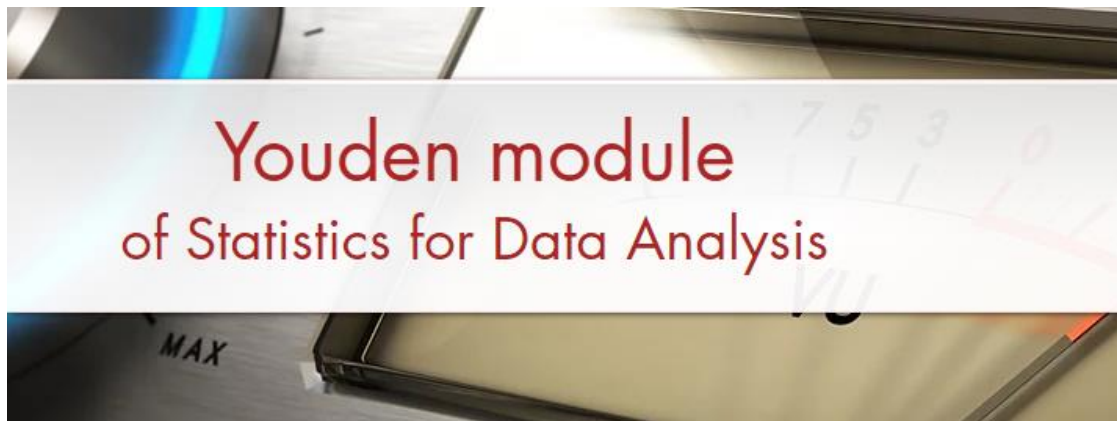


Simple Sample Base

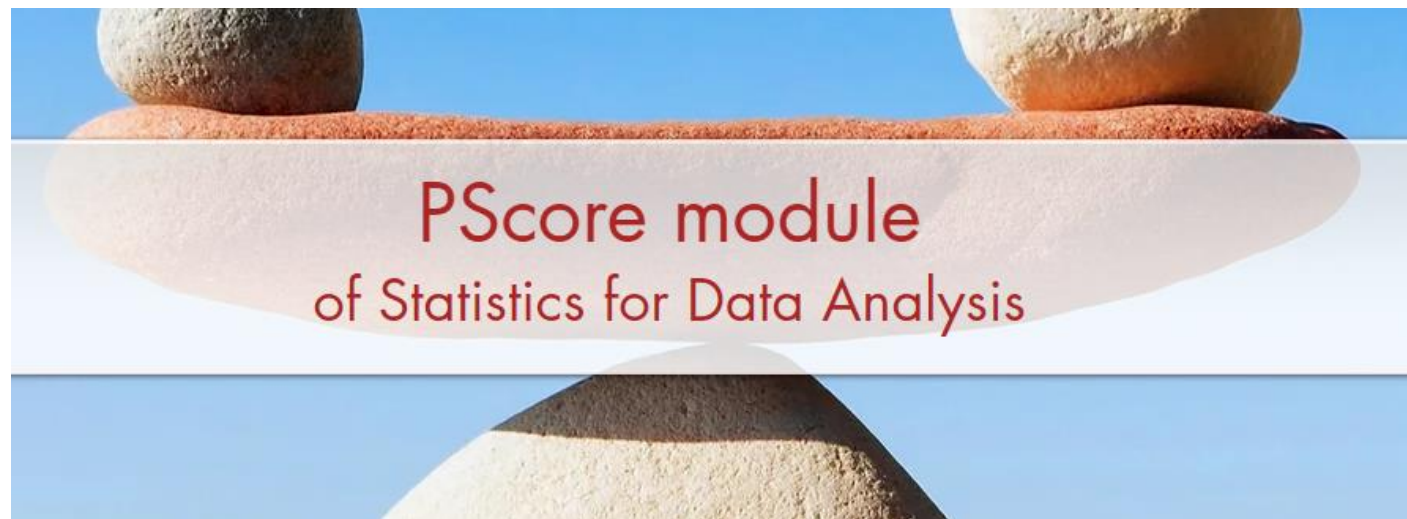


Automatic ID

Statistics for Data Analysis License Conditions



helps you determine the optimal cut-off of an ROC curve, a very useful technique that shows classification performance at different probability thresholds



implements the Propensity Score Matching technique considered as an alternative to classical multivariate analyses when you need to analyse data from non-randomised studies



Area reserved for the customers

ask methodological questions through the dedicated form



[See the answers to the questions already received](#)



[Fill in the form, send us your question](#)

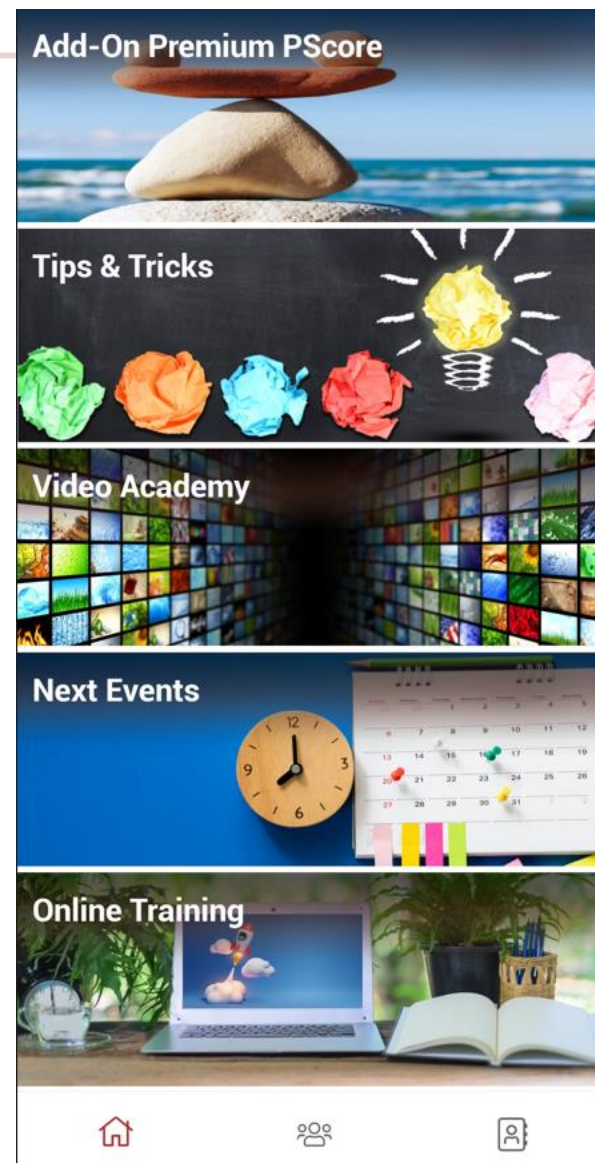
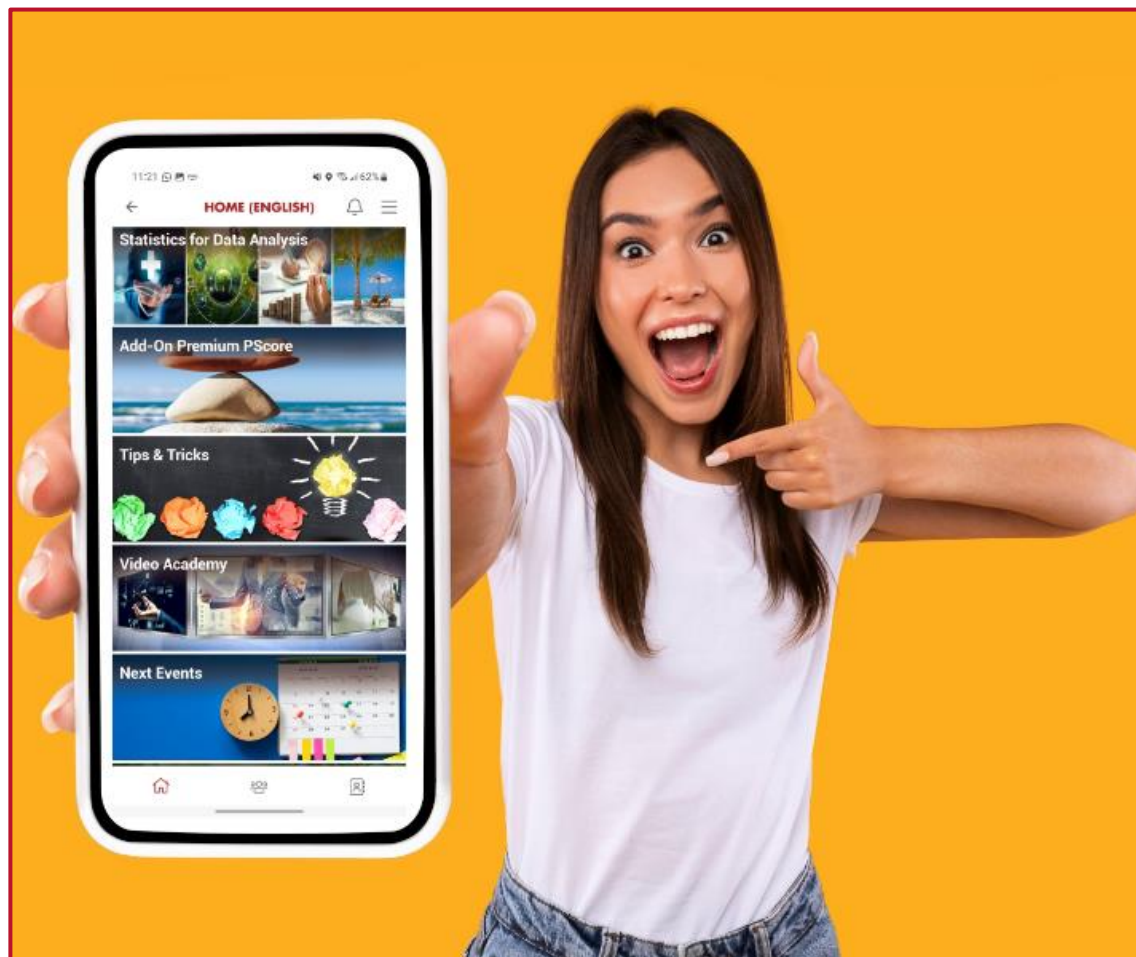


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Op Tools | APP Statistics for Data Analysis



Statistics for Data Analysis

I servizi inclusi nella soluzione (LaunchBox, Add-On, APP, webinar, Support, ...)

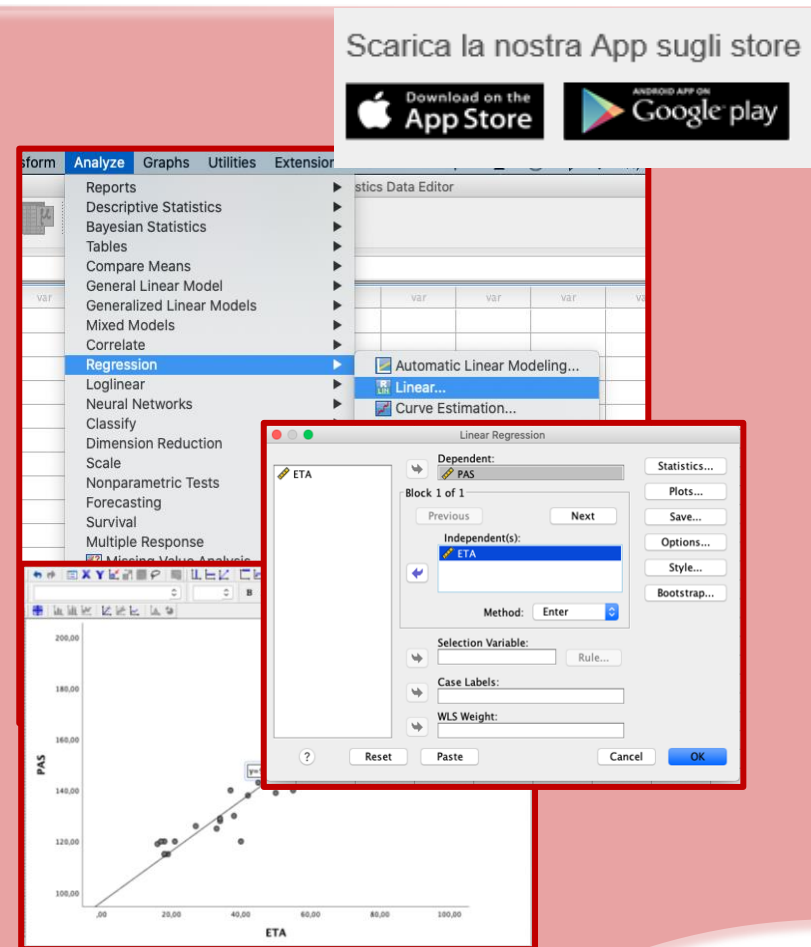
ANOVA a Misure Ripetute

- Contesto introduttivo
- Inferenza Statistica
- Esempio applicativo
- Q&A

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- ANOVA allows to estimate the contribution of qualitative variables (Ordinal and Nominal).
- ANOVA is an extension of the t-test that is used when you have more than 2 groups. The dependent variable must be quantitative while the independent variables must be qualitative.

- The Repeated Measures ANOVA is an extension of the paired-samples t-test.
- Repeated Measures (MR) means that the same statistical case has been measured several times on the same variable.

- From the variance between subject to the variance within subject.
- The Repeated Measures ANOVA is very similar to the between subject ANOVA .
- The Effects are evaluated as between-group differences versus within-group differences.

Introduction ANOVA Repeated measures

- The variance explained in the ANOVA between subject.

Genre	TestT1	TestT2	TestT3
F	21,95	23,17	22,56
F	23,95	25,09	24,52
F	18,93	20,32	19,63
F	15,93	17,32	16,63
F	20,91	22,47	21,69
M	18,91	20,27	19,59
M	17,93	19,27	18,60
M	22,96	24,22	23,59
M	13,95	15,09	14,52
M	19,92	21,07	20,50

Variance
Between Groups

Variance
Within Groups

Variance Between Groups

Variance Within Groups

- From the variance between subject to the variance **within subject**.
- The difference is that the levels of the variables are not measured on different subjects, but represent the different conditions (times, torque, etc.) in which the dependent variable is measured.

- The variability we compare now is all within the group.

	TestT1	TestT2	TestT3
	21,95	23,17	22,56
	23,95	25,09	24,52
	18,93	20,32	19,63
	15,93	17,32	16,63
	20,91	22,47	21,69
	18,91	20,27	19,59
	17,93	19,27	18,60
	22,96	24,22	23,59
	13,95	15,09	14,52
	19,92	21,07	20,50
MEDIE:	19,534	20,829	20,183

Varianza di errore

Varianza dovuta all'effetto

- The MR ANOVA allows us to determine whether the **variability** between the means of several repeated measures is large enough, relative to the within-measure **variability**, so that the difference between the means is **statistically significant**.

Varianza dell'effetto T1 vs T2

	TestT1	TestT2
	21,95	23,17
	23,95	25,09
	18,93	20,32
	15,93	17,32
	20,91	22,47
	18,91	20,27
	17,93	19,27
	22,96	24,22
	13,95	15,09
	19,92	21,07
MEDIE:	19,534	20,829

- L'analisi della varianza ci dice se la differenza tra le medie delle diverse misure ripetute è abbastanza grande rispetto alla variabilità dentro le misure da poter dire che la differenza tra le medie è statisticamente significativa.

Varianza di errore

Varianza dovuta
all'effetto

Varianza dell'effetto T1 vs T2

Varianza di errore

- It is useful to think of the within subject effects as the **mean of the differences** between the measures, calculated for each subject.

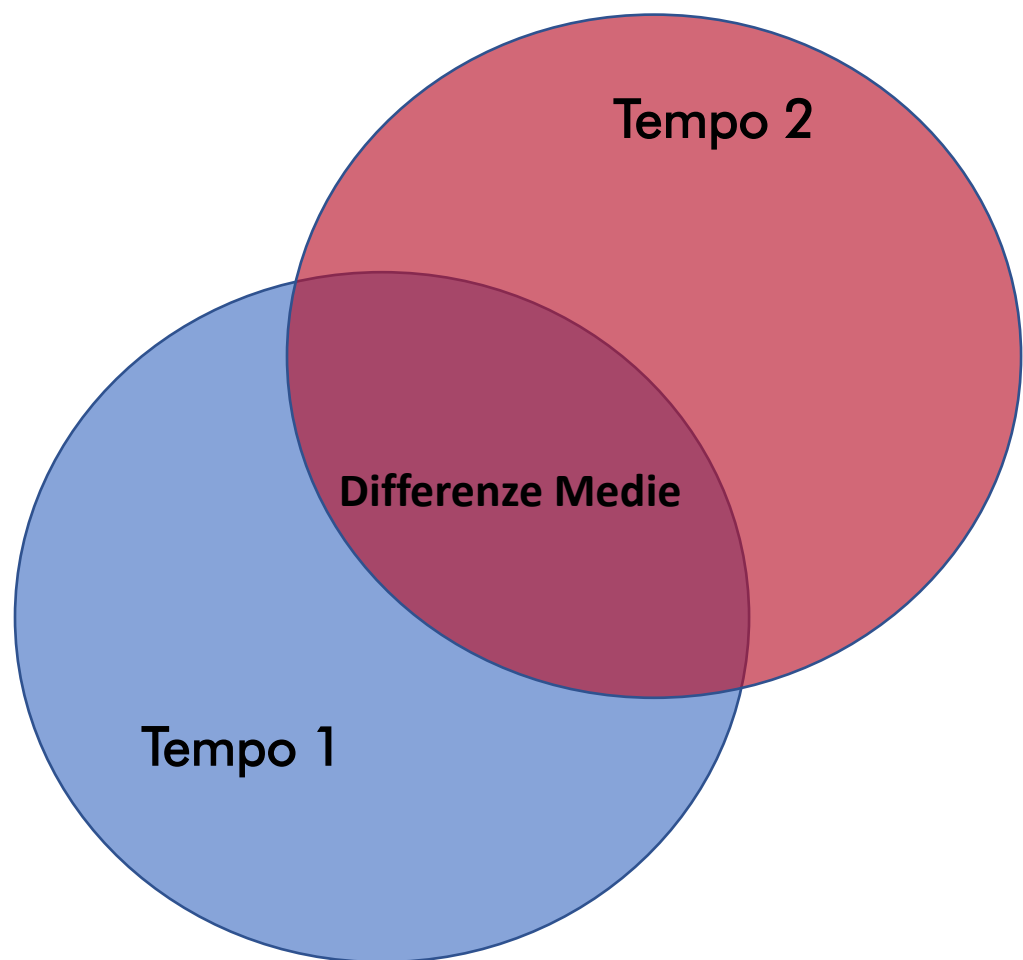
 TestT1	 TestT2
21,95	23,17
23,95	25,09
18,93	20,32
15,93	17,32
20,91	22,47
18,91	20,27
17,93	19,27
22,96	24,22
13,95	15,09
19,92	21,07

Media delle differenze

Errore standard delle differenze

MEDIE:	19,534	20,829	1,295
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Media delle differenze



Riabilitazione.sav [Dataset2] - IBM SPSS Statistics Editor dei dati

File Modifica Visualizza Dati Trasforma **Analizza** Grafici Programmi di utilità Estensioni Finestra Guida

Analyze Add-On >
SimpleSample >
Analisi di potenza >
Report >
Statistiche descrittive >
Statistiche bayesiane >
Tabelle >
Confronta medie >
Modello lineare generale >
Modelli lineari generalizzati >
Modelli misti >
Correlazione >
Regressione >
Loglineare >
Reti neurali >
Classifica >

Medie...
Test T a campione singolo...
Test T a campioni indipendenti...
Test T a campioni indipendenti di riepilogo
Test T a campioni accoppiati...
ANOVA a una via...

Soggetto	Genere	TestT3	var	var	var
1	1 M				
2	2 F				
3	3 F				
4	4 M				
5	5 F				
6	6 M				
7	7 M				
8	8 F				
9	9 F				
10	10 M				
11	11 F				
12	12 M				
13	13 F				
14	14 M				
15	15 F				

- Statistics for Data Analysis Output

Statistiche campioni accoppiati

		Media	N	Deviazione std.	Errore standard della media
Coppia 1	Test T1	19,4826	39	2,65348	,42490
	Test T2	20,7705	39	2,62087	,41967

Correlazioni campioni accoppiati

		N	Correlazione	Sign.
Coppia 1	Test T1 & Test T2	39	,991	,000

Test campioni accoppiati

		Differenze accoppiate					t	gl	Sign. (a due code)
		Media	Deviazione std.	Errore standard della media	Intervallo di confidenza della differenza di 95%				
					Inferiore	Superiore			
Coppia 1	Test T1 - Test T2	-1,28795	,35408	,05670	-1,40273	-1,17317	-22,716	38	,000

- Il mio gruppo di ricerca era interessato a testare l'efficacia di una nuova tecnica riabilitativa nel campo delle neuroscienze.
- Viene fatta una valutazione in tre momenti, prima della riabilitazione (T1), dopo la cura (T2) ed un follow-up a 3 mesi di distanza (T3).

ANOVA Repeated measures Example

- Vista dati di Statistics for Data Analysis

Riabilitazione.sav [Dataset2] - IBM SPSS Statistics Editor dei dati

	Soggetto	Genere	Età	TestT1	TestT2	TestT3	va
1	1	M	67	18,91	20,27	19,59	
2	2	F	68	19,88	21,27	20,58	
3	3	F	74	17,96	19,27	18,62	
4	4	M	81	17,93	19,27	18,60	
5	5	F	68	19,88	21,27	20,58	
6	6	M	72	22,96	24,22	23,59	
7	7	M	76	13,95	15,09	14,52	
8	8	F	64	18,89	20,47	19,68	
9	9	F	69	16,87	18,22	17,55	
10	10	M	68	19,92	21,07	20,50	
11	11	F	73	18,88	20,54	19,74	

- L'ANOVA a Misure Ripetute rappresenta un caso del **modello lineare generale** in cui la variabilità non è valutata tra gruppi ma tra misure diverse in occasioni diverse.

QUESTIONS & ANSWERS



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Untitled1 [DataSet0] - IBM SPSS Statistics Data Editor

File Edit View Data Transform Analyze Graphs Utilities Extensions Window Help

Data Add-On

Define Variable Properties...

Set Measurement Level for Unknown...

Copy Data Properties...

New Custom Attribute...

Define date and time...

Define Multiple Response Sets...

Validation

Identify Duplicate Cases...

Identify Unusual Cases...

Compare Datasets...

Sort Cases...

Sort Variables...

Transpose...

Merge Files

+ Text Extraction

+ String deduplication

+ Split Strings

+ Split random files

+ Replace Outliers

+ Remove Duplicates

+ Keep Information

+ File division

+ Exclude Outliers

+ Duplicate Cases

+ Case Validation

+ AutomaticID

+ Add days

+ Add 60 days

Statistics for Data Analysis

SPS Service Program

Thank you from SPS



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