

# > What's New in SPSS Statistics 28.0

The more we shift towards the digital platforms the need of preserving the information along with the use of data analysis technique increases. In order to facilitate the researchers across the globe to deal with the different views expressed by several studies SPSS family comes up with a brand new version.

Following are the features that have been introduced in the current version of the IBM SPSS Statistics 28.

## Analyze Procedures

### ■ Meta Analysis

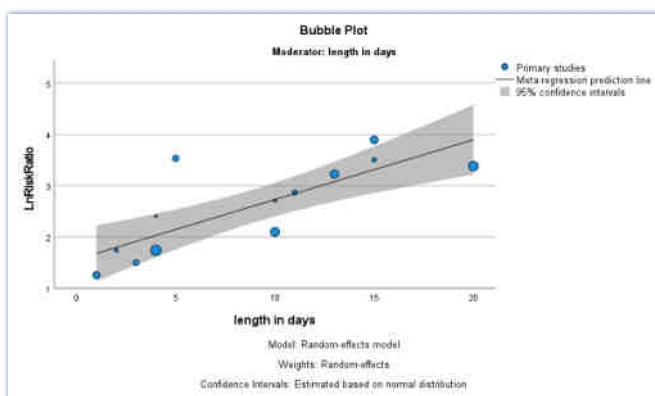
Meta-analysis is the scientific process to synthesize and combine different results from different studies. It can also help us in understanding the magnitude of the effect size and the causes of potential variation. Meta analysis can provide more robust point estimates with higher power as compared to the individual studies.

#### Meta-Analysis: Regression

Model Coefficient Test		
Wald Chi-square	df	Sig.
17.631	1	<.001

Tests the null hypothesis that all coefficients other than the intercept are equal to zero.

Parameter Estimates						
Parameter	Estimate	Std. Error	Z	Sig. (2-tailed)	95% Confidence Interval	
					Lower	Upper
(Intercept)	1.564	.3017	5.194	<.001	.974	2.155
length in days	.117	.0278	4.199	<.001	.062	.171



In Spss 28.0 the following options are included under Meta Analysis.

1. Meta-analysis of continuous outcomes: Raw data, pre-calculated effect size data
2. Meta-analysis of binary outcomes: Raw data, pre-calculated effect size data
3. Meta-regression

## Procedural Enhancements

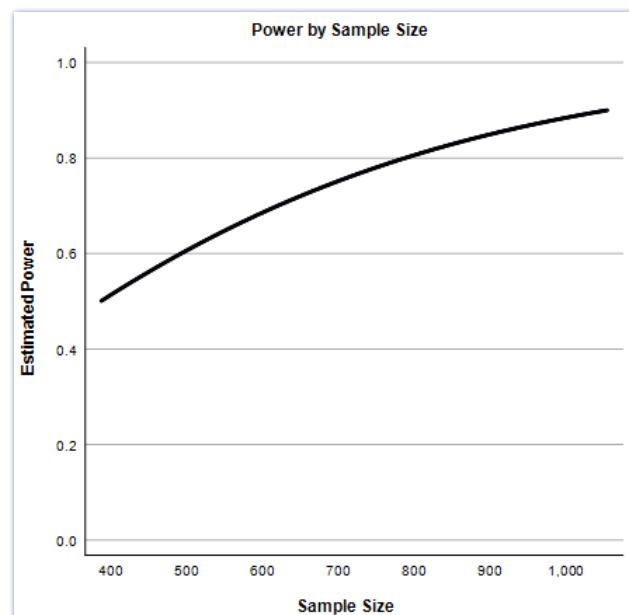
### ■ Power Analysis

This option was introduced in the 27 version to help us determine the optimum sample size for a study or project. Sometimes when it is difficult to gather information it becomes very important to know the necessary sample size for an acceptable probability of detecting specified effects.

SPSS 28 now comes with the option of enhanced power analysis. All the procedures under power analysis now provide the option to enter a series of power values rather than a single one. These can take the form of separate (point) values, a series of values incremented by a specific amount, or a combination of both.

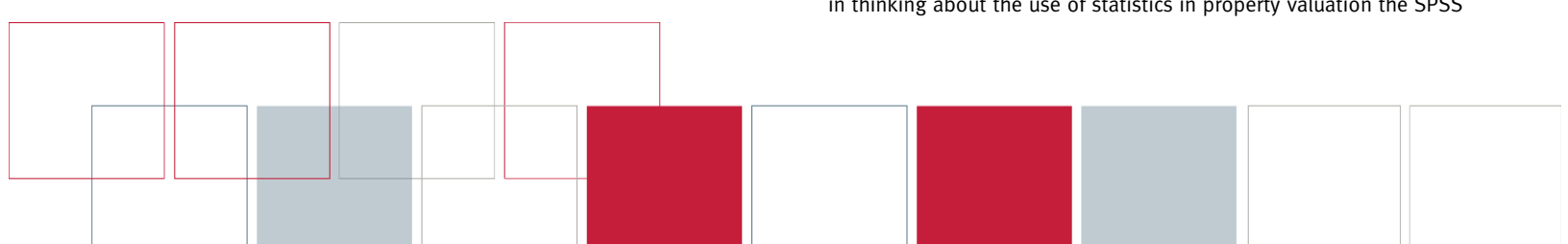
Power Analysis Table						
Test for Mean	N	Actual Power <sup>a</sup>	Test Assumptions			
			Power	Std. Dev.	Effect Size	Sig.
1	603	.501	.500	50	.080	.05
2	768	.600	.600	50	.080	.05
3	967	.700	.700	50	.080	.05
4	1229	.800	.800	50	.080	.05
5	1644	.900	.900	50	.080	.05

a. Two-sided test  
b. Based on non-central t-distribution.



### ■ Ratio Statistics

Ratio Statistics is a useful option while working with ratios of property assessment values to sales prices. As we observe the changes in thinking about the use of statistics in property valuation the SPSS



Statistics 28 comes with the enhancement of the Ratio Statistics option. This enhancement is in line with the current thinking as described in the Standard on Ratio Studies document published by the International Association of Assessing Officers to make it more consistent with the current thinking.

The major change in this version under Ratio Statistics is the introduction of the coefficient of price related bias or PRB. This PRB comes with an associated confidence interval. This index (PRB) tells us whether the assessment ratios are systematically higher or lower for high-priced properties. Other changes include the removal of coefficient of variation based on median ratio, relabeling the remaining coefficient of variation option based on the mean ratio as COV etc.

Ratio Statistics for Credit card debt in thousands / Household income in thousands			
Group	Price Related Bias	95% Confidence Interval for Price Related Bias	
		Lower Bound	Upper Bound
Did not complete high school	.777	.691	.861
High school degree	.803	.672	.933
Some college	.497	.337	.657
College degree	.577	.764	.889
Post undergraduate degree	.535	1.725	.654
Overall	.730	.664	.796

**Other Procedural enhancements**

In all the earlier versions the user had the choice to run the two-tailed t-test only. In order to run the one-sided option they had to refer to the tech note from IBM. Now from SPSS Statistics 28.0 the user would be able to run the one-sided t-test from the dialog itself.

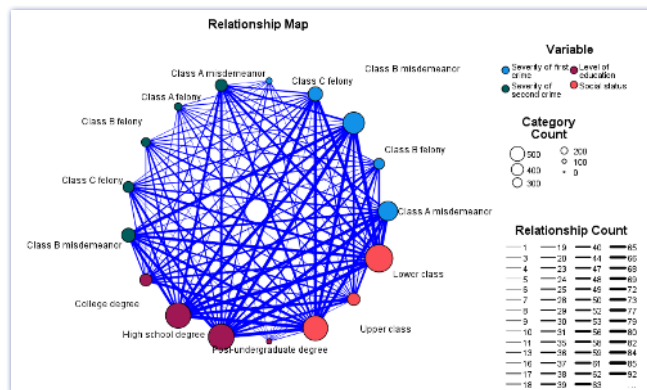
A new graphical user interface control is being designed for GLM and UNIANOVA. Specifically, an additional checkbox “Compare simple main effects” is being added to the “EM Means” sub-dialog to support the specification of comparisons among the main effects nested within the levels of other factors.

Apart from these few adjustments were made to the contrast sub-menu under both Logistic Regression and COXREG.

**Output enhancements**

**Relationship Maps**

SPSS Statistics 28 comes with the inclusion of new data visualization technique Relationship maps. Users can now crosscheck the interrelationship among the variables based on the thickness of the connections and the size of the categories indicator.

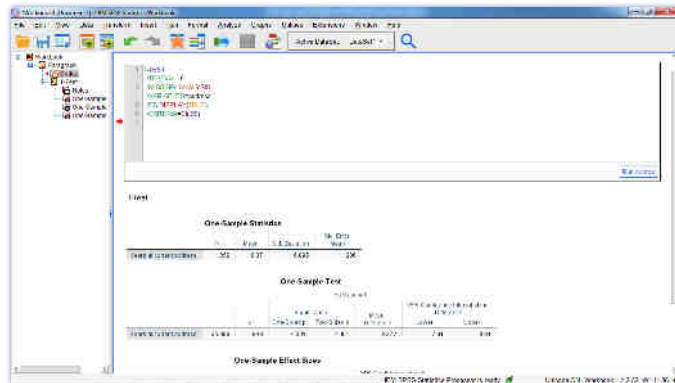


**Everyday Usability Improvements**

**Statistics Workbook**

This feature is a new introduction in SPSS 28.0. This one gives the user the flexibility to write syntax, create output, and edit that output all within the workbook. This option offers more interactive approach while working with the software. Following are the steps to make workbook option active.

Edit -> Options -> Application Mode (Select Workbook option here)



**Search Enhancements**

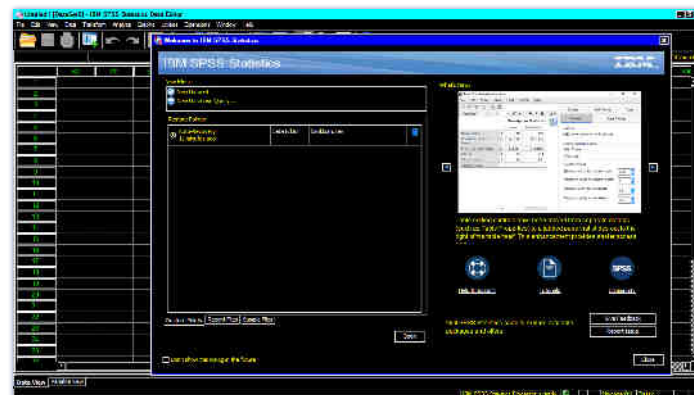
This option, introduced in version 27 is enhanced to help the users with inclusion of links for menu dialogs, case studies etc. Clicking a search result the user would be redirected to the relevant page.

**Side-Pane Table Editor**

With SPSS 28 the editing option for the output table is now being improved. Upon double click on output the user could now edit their tables using this side pane more easily.

**High Contrast Accessibility**

SPSS Statistics 28 now comes with the accessibility support for high contrast. Any windows user once he selects High Contrast mode and opens SPSS Statistics, the view in SPSS Statistics will automatically display a high contrast mode. For Mac, if the user wants to use high contrast mode, open System Preferences, click Accessibility, then drag the Display contrast slider to adjust the display contrast.



## Features added in SPSS 27.0

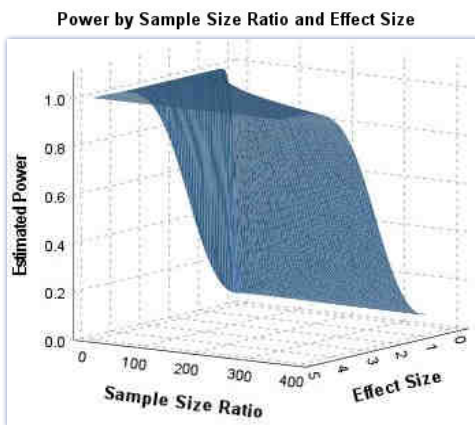
### Power Analysis:-

This option is introduced to help us in determining the optimum sample sizes for a study or project. 11 new procedures have been introduced under this feature. Sometimes when it is difficult to gather information it becomes very important to know the necessary sample size for an acceptable probability of detecting specified effects.

This feature includes the graphical capabilities for expressing power as a function of sample size and effect size. It includes the 3-dimensional plots also.

Power Analysis Table						
Test for Mean <sup>a</sup>	N	Actual Power <sup>b</sup>	Test Assumptions			
			Power	Std. Dev.	Effect Size	Sig.
Test for Mean <sup>a</sup>	197	.801	.8	.01	.201	.05

a. Two-sided test.  
b. Based on noncentral t-distribution.



There are 11 new procedures that have been introduced in the current version and those are distributed in four submenus. Following are the Power analysis procedures:

**Means** – One sample t-test, paired sample t-test, independent sample t-test and one-way ANOVA.

**Proportions** – One sample binomial test, related-samples binomial test and independent samples binomial test.

**Correlations** - Pearson's product-moment, Spearman's rank-order and partial.

**Regression** – Univariate linear.

### Weighted Kappa procedure

This procedure is also known as Cohen's weighted kappa. This method is widely used in summarizing the inter rater agreement on an ordinal scale. It also helps in understanding the closeness of agreement between raters. In SPSS Statistics 27.0 following weighted versions of Cohen's weighted kappa are being introduced:

**Linear weighting**

**Quadratic weighting**

**Confidence intervals for all kappa coefficients**

Cohen's Weighted Kappa						
Ratings	Weighted Kappa <sup>a</sup>	Std. Error <sup>b</sup>	Asymptotic		95% Asymptotic Confidence Interval	
			z <sup>c</sup>	Sig.	Lower Bound	Upper Bound
Italy - South Korea	.587	.022	17.388	.000	.543	.631

a. The estimation of the weighted kappa uses linear weights.  
b. Value does not depend on either null or alternative hypotheses.  
c. Estimates the asymptotic standard error assuming the null hypothesis that weighted kappa is zero.

## Procedural Enhancements

### Effect Sizes

This version also includes additional effect sizes. This enhancement to the t-test and one-way procedures add effect size estimates and confidence intervals for the following options:

One-sample t-tests, independent-sample t-tests, paired samples t-tests, one-way analysis of variance (ANOVA) and custom contrasts in one-way ANOVA.

Effect size options are available in the procedure setup dialog

ANOVA Effect Sizes <sup>a</sup>				
Total DVD assessment		Point Estimate	95% Confidence Interval	
			Lower	Upper
	Eta-squared	.361	.131	.474
	Epsilon-squared	.309	.060	.432
	Omega-squared Fixed-effect	.306	.060	.428
	Omega-squared Random-effect	.081	.013	.130

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

### Quantile Regression enhancements

Apart from the above mentioned ones SPSS Statistics 27 also comes with the user interface improvements for Quantile regression to support a grid of quantiles.

### MATRIX enhancements

In order to simplify the programming procedures for the advanced users SPSS Statistics 27.0 includes enhancements to the MATRIX procedure.

This option would reduce the need to use the COMPUTE command.

### Output enhancements

#### Bubble chart

This option included in the scatter plot functionality would help the user bring a new dimension to the reports and visualizations. The size of each bubble or circle is proportional to its value.

These charts are very useful for comparing relationships in the data.



## Features added in SPSS 26.0

### Bayesian Statistics

#### One-way Repeated Measures ANOVA

This new procedure measures one factor from the same subject at each distinct time point or condition, and allows subjects to be crossed within the levels. It is assumed that each subject has single observation for each time point or condition (as such, the subject-treatment interaction is not accounted for).

#### One Sample Binomial enhancements

The procedure provides options for executing Bayesian one-sample inference on Binomial distribution. The parameter

of interest is  $\pi$ , which denotes the probability of success in a fixed number of trials that may lead to either success or failure. Note that each trial is independent of each other, and the probability  $\pi$  remains the same in each trial. A binomial random variable can be seen as the sum of a fixed number of independent Bernoulli trials.

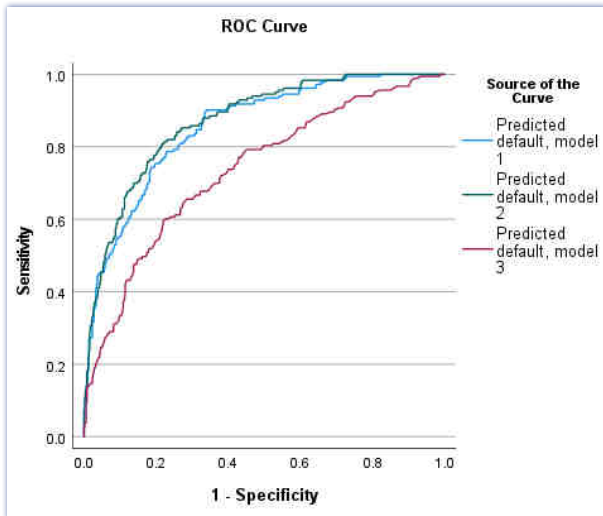
– **One Sample Poisson enhancements**

The procedure provides options for executing Bayesian one-sample inference on Poisson distribution. Poisson distribution, a useful model for rare events, assumes that within small time intervals, the probability of an event to occur is proportional to the length of waiting time. A conjugate prior within the Gamma distribution family is used when drawing Bayesian statistical inference on Poisson distribution.

■ **Quantile Regression:**

Quantile Regression helps in modelling the relationship between a set of predictor (independent) variables and specific percentiles (or “quantiles”) of a target (dependent) variable, most often the median.

■ **ROC Analysis**



The ROC analysis assesses the accuracy of model predictions by plotting sensitivity versus 1-specificity of a classification test (as the threshold varies over an entire range of diagnostic test results).

■ **Reliability Analysis**

Another procedure had been updated to provide options for Fleiss’ Multiple Rater Kappa statistics that assess the inter rater agreement to determine the reliability among the various raters. A higher agreement provides more confidence in the ratings reflecting the true circumstance. The Fleiss’ Multiple Rater Kappa options are available in the Reliability Analysis: Statistics dialog.

**System Requirements**

**IBM SPSS Statistics 28 for Windows**

**Operating System**

- **Windows 10 Education**
- **Windows 10 Home**
- **Windows 10 Pro**
- **Windows 10 Enterprise**

**Hardware**

- **Memory:** 4 gigabyte (GB) of RAM or more is required, 8 Gigabyte (GB) of RAM or more is recommended for 64-bit Client Platforms.
- **Disk Space:** 4 Gigabytes (GB) of available hard-disk space.
- **Processor:** 2 GHz or faster.
- **Display:** 1024\*768 or higher screen resolution

**IBM SPSS Statistics 28 for Mac**

**Operating System**

- **Mac OS High Sierra 10.13**
- **Mac OS Catalina 10.15**
- **Mac OS Mojave 10.14**
- **Mac OS Big Sur 11.0**

The product Runs natively as a 64-bit application in a 64-bit operating environment.



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