

Using Wilson's SPSS Macro to Compute Q-Tests

David Wilson has provided SPSS Macros (and other goodies) at: <http://mason.gmu.edu/~dwilsonb/ma.html>. The “Demo of Wilson SPSS Macro for mean ES” tells you how to download and install the macro.

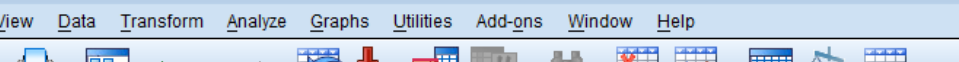
What's a macro and what do you do with it? A macro is just a pre-written bit of SPSS syntax that you use much like you use other SPSS commands and programs. There is an extra step or two, but compared to having to program the material yourself....

Your data set for this analysis will need to include at least three variables:

The ES values: Be sure to use the final ready-to-analyze ES values – with whatever transformations, adjustments, outlier analysis, etc that you intend. The macro uses these exact ES values.

The inverse weighting values: These should be the weights for a fixed effects model. The macro will use these for computing the fixed effect model and the macro will modify these for use in the random effect model.

One or more grouping variables: Be sure each is a categorical variable!!!



The screenshot shows the IBM SPSS Statistics Data Editor window. The title bar reads "*demo_data_133a.sav [DataSet2] - IBM SPSS Statistics Data Editor". The menu bar includes File, Edit, View, Data, Transform, Analyze, Graphs, Utilities, Add-ons, Window, and Help. The toolbar contains various icons for file operations, data manipulation, and analysis. The data grid shows 5 rows of data with 8 columns: an unlabeled column, ES1_Zr, samplesize, inverse_weight, design, prop_female, population, and Tx_length. The data values are as follows:

	ES1_Zr	samplesize	inverse_weight	design	prop_female	population	Tx_length
1	.25	106	103	0	.52	0	12.00
2	.29	104	101	0	.65	0	12.00
3	.46	110	107	0	.62	0	16.00
4	.11	65	62	0	.61	0	11.00
5	.29	90	87	0	.38	0	10.00

The screenshot shows the IBM SPSS Statistics Syntax Editor interface. The title bar indicates the file is named "meta_F_macrouse_demo_133a.sps". The menu bar includes File, Edit, View, Data, Transform, Analyze, Graphs, Utilities, Add-ons, Run, Tools, Window, and Help. The toolbar contains various icons for file operations, editing, and analysis. The main text area displays the following syntax:

```

include
META F ES =
META F ES =

1 include 'C:\Program Files\IBM\SPSS\MACROS\MetaF.sps'.
2
3
4 META F ES = ES1_Zr
5     /W = inverse_weight
6     /GROUP = design.
7
8
9
10
11 include 'C:\Program Files\IBM\SPSS\MACROS\MetaF.sps'.
12
13 META F ES = ES1_Zr
14     /W = inverse_weight
15     /GROUP = design
16     /MODEL = ML.
17
18

```

The left margin shows line numbers 1 through 18. The status bar at the bottom indicates "IBM SPSS Statistics Processor is ready" and "In 9 Col 0".

← the Include statement initializes the macro

← Fixed Effect analysis

- ES tells effect size variable
- W tells the inverse weighting variable
- GROUP tells the analysis variable

← Random Effect analysis

- ➔ ES tells effect size variable
- ➔ W tells the inverse weighting variable
- ➔ GROUP tells the analysis variable
- ➔ MODEL tells which model to use
 - MM - is method-of-moments
 - ML - is full-information ML
 - REML – restricted-information ML

***** Inverse Variance Weighted Oneway ANOVA *****

***** Fixed Effects Model via OLS *****

----- Analog ANOVA table (Homogeneity Q) -----

	Q	df	p
Between	24.5439	1.0000	.0000
Within	118.0299	68.0000	.0002
Total	142.5737	69.0000	.0000

----- Q by Group -----

Group	Qw	df	p
.0000	53.4394	31.0000	.0074
1.0000	64.5905	37.0000	.0033

----- Effect Size Results Total -----

	Mean ES	SE	-95%CI	+95%CI	Z	P	k
Total	.2667	.0121	.2430	.2904	22.0460	.0000	70.0000

----- Effect Size Results by Group -----

Group	Mean ES	SE	-95%CI	+95%CI	Z	P	k
.0000	.1992	.0182	.1635	.2349	10.9277	.0000	32.0000
1.0000	.3199	.0162	.2882	.3516	19.7776	.0000	38.0000

----- END MATRIX -----

Fixed Effect Model results

Significant between groups variance -
 ← indicates “design” is related to ES
 ← Significant within-groups variance -
 indicates there may be additional
 . variables related to ES

← overall mean effect size & NHST

← mean effect size & NHST for each
 . group

***** Inverse Variance Weighted Oneway ANOVA *****

***** Mixed Effects Model *****

----- Analog ANOVA table (Homogeneity Q) -----

	Q	df	p
Between	14.2395	1.0000	.0002
Within	66.9885	68.0000	.5119
Total	81.2280	69.0000	.1489

----- Q by Group -----

Group	Qw	df	p
.0000	30.4201	31.0000	.4957
1.0000	36.5684	37.0000	.4891

----- Effect Size Results Total -----

	Mean ES	SE	-95%CI	+95%CI	Z	P	k
Total	.2664	.0159	.2353	.2976	16.7494	.0000	70.0000

----- Effect Size Results by Group -----

Group	Mean ES	SE	-95%CI	+95%CI	Z	P	k
.0000	.1997	.0238	.1531	.2463	8.3941	.0000	32.0000
1.0000	.3204	.0214	.2785	.3623	14.9773	.0000	38.0000

----- Maximum Likelihood Random Effects Variance Component -----

v = .00727
 se(v) = .00297

----- END MATRIX -----

Random Effect Model results

Significant between groups variance -
 ← indicates “design” is related to ES
 ← non-significant within-groups variance

← overall mean effect size & NHST

← mean effect size & NHST for each
 . group

← estimate of the systematic variation . .
 . across studies

Most sources recommend completing and presenting both the Fixed and Random effect models.

Be sure you know which approaches/interpretations are “standard” for your research area & audience!

