Using Wilson's SPSS Macro to Compute Meta Regression

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.

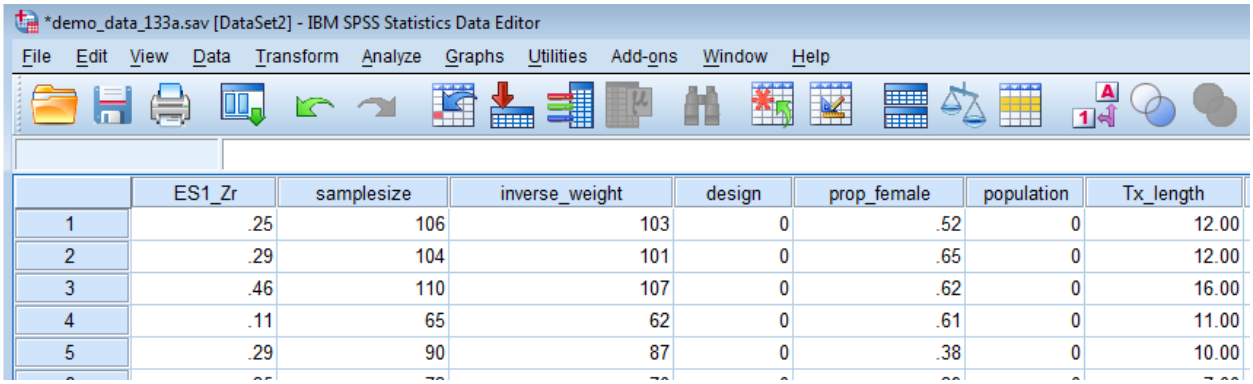
What's a macro and what do you do with it? A macro is just a pre-written bit of SPSS syntax that you use much like you use other SPSS commands and programs. There is an extra step or two, but compared to having to program the material yourself….

Your data set for this analysis will need to include the effect size values and coded variables that describe differences among the studies.

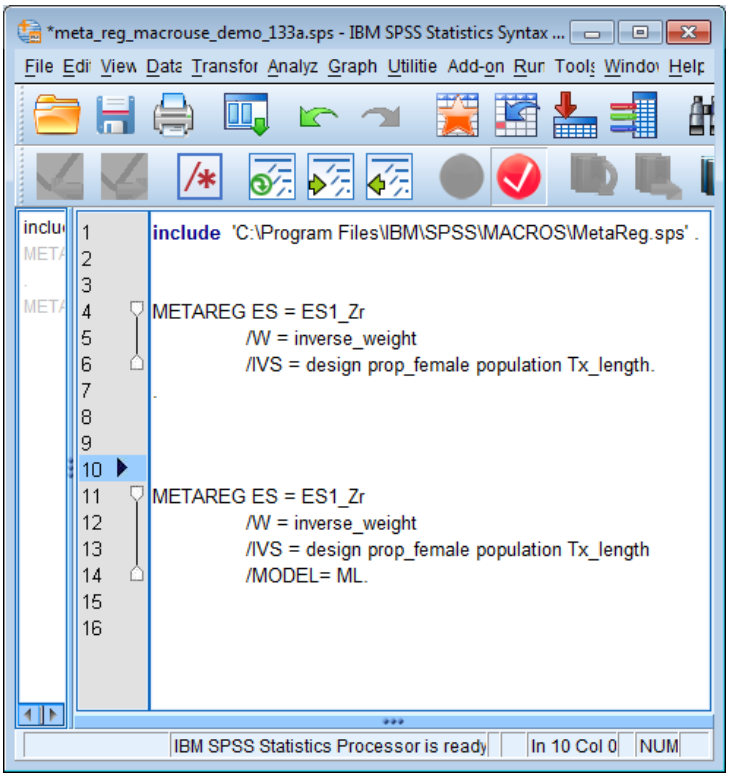
The ES values: Be sure to use the final ready-to-analyze ES values – with whatever transformations, adjustments, outlier analysis, etc that you intend. The macro uses these exact ES values.

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 study attribute variables: These can be quantitative, binary, coded categorical, interactions – anything that you think captures differences among the studies that could account for ES differences!!!



	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 Include statement initializes the macro

← Fixed Effect analysis
- ➔ ES tells effect size variable
- ➔ W tells the inverse weighting variable
- ➔ IVS tells the analysis variables

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

Fixed Effect Model results

```
 *****  Inverse Variance Weighted Regression  *****

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

------- Descriptives -------
      Mean ES     R-Square            k
        .2667        .4094      70.0000

------- Homogeneity Analysis -------
                    Q           df            p
Model         58.3731       4.0000        .0000
Residual      84.2006      65.0000        .0549
Total        142.5737      69.0000        .0000

------- Regression Coefficients -------
               B       SE  -95% CI  +95% CI        Z        P     Beta
Constant   .2577    .0708    .1190    .3964   3.6416    .0003    .0000
design     .1016    .0253    .0519    .1513   4.0104    .0001    .3492
prop_fem  -.3374    .0825   -.4991   -.1758  -4.0907    .0000   -.3464
populati   .0417    .0257   -.0087    .0921   1.6207    .1051    .1437
Tx_lengt   .0132    .0038    .0057    .0208   3.4535    .0006    .2977

------ END MATRIX -----
```

← overall mean effect size & NHST

Significant Model - indicates
← ES is related to variables
← Significant within-groups variance - would indicate there may be more variables related to ES

← ES larger for design=1 than design=0
← ES larger for fewer females in sample
← 2 populations have same effect size
← ES larger for longer effects
… after controlling for other variables in the meta analytic model.

Random Effect Model results

```
Run MATRIX procedure:

Version 2005.05.23

 *****  Inverse Variance Weighted Regression  *****
 *****  Random Intercept, Fixed Slopes Model  *****

------- Descriptives -------
      Mean ES     R-Square            k
        .2666        .4089      70.0000

------- Homogeneity Analysis -------
                    Q           df            p
Model         45.8903       4.0000        .0000
Residual      66.3247      65.0000        .4310
Total        112.2150      69.0000        .0008

------- Regression Coefficients -------
               B       SE  -95% CI  +95% CI        Z        P     Beta
Constant   .2591    .0795    .1033    .4148   3.2603    .0011    .0000
design     .1025    .0284    .0468    .1583   3.6071    .0003    .3539
prop_fem  -.3367    .0925   -.5180   -.1555  -3.6411    .0003   -.3480
populati   .0402    .0289   -.0164    .0967   1.3913    .1641    .1389
Tx_lengt   .0131    .0043    .0047    .0216   3.0485    .0023    .2961

------- Maximum Likelihood Random Effects Variance Component -------
v      =   .00259
se(v)  =   .00215

------ END MATRIX -----
```

← overall mean effect size & NHST

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← ES larger for design=1 than design=0
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… after controlling for other variables in the meta analytic model.

← 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!