Version History

Matlab Toolbox 'Measures of Effect Size'

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Version 1.2 (March 2012)

We have deliberately taken a small step back, namely from standardized to unstandardized mean differences: it is now possible to obtain as an output the mean difference between two samples (mes.m) and the oneway and twoway equivalents, contrasts (mes1way.m and mes2way.m). Mean differences are of course trivial to compute, but confidence intervals may pose a challenge, particularly those of contrasts in oneway and twoway analyses. We included these unstandardized mean differences because statistics expressed in the original units of measurement (e.g. millivolts) may confer a better 'feeling' for the relevance of differences between groups, depending on the data at hand. Even unstandardized mean differences including confidence intervals provide more information than p values from t-tests. Similar arguments apply to contrasts and confidence intervals. So, the details:

mes.m

- new output fields md and mdCi (mean difference and corresponding confidence intervals)
- the code computing t statistics has been streamlined: instead of resorting to the Matlab-provided functions ttest.m and ttest2.m the code now computes all relevant terms from scratch. This is more economical than the previous version because many terms computed in this section are building blocks not only for the t statistic but also for e.g. Hedges' g. Please note that values of the terms affected by this change (t, p, mdbysd, requiv, Hedges' g, and confidence intervals thereof) may differ between versions 1.1. and 1.2. in the very remote digits (by ca. 10^{-15} for typical test examples) due to different arithmetics and, consequently, rounding errors, in both versions.
- field stats.t.sd (the estimate of the population standard deviation) is gone as this term is probably of little use for most users
- minor edits of comments

mes1way.m

- new output fields psi and psiCi (contrast and corresponding confidence interval)
- correction of a silly bug in the computation of confidence intervals of contrast-related MES for dependent data with option 'tDenom' set to 'msw' (the code would crash with bootstrapped data because of an indexing error)
- minor edits of comments

mes2way.m

- new output fields psi and psiCi (contrast and corresponding confidence interval)
- minor edits of comments

mestab.m
- minor edits of comments

documentation
- enlarged section on confidence intervals
- included mean difference and contrasts
- minor edits

Version 1.1 (October 2011)

mes.m
- U3 and U3_1 behaved incorrectly with discretized data (e.g. histogram data). Consider an extreme example: `mes(zeros(10,1),zeros(10,1),'U3')`. The two groups are identical, so the result should be 0.5, the zero effect value, but the old version yielded U3=1. This is now corrected, by counting the number of values in the 'lower' group which are exactly at the median of the 'higher' group with a factor of 0.5.

mes1way.m
- for *dependent* data, there was an inconsistency in the computation of F and p values of *contrasts:* F values were computed as the ratio of SS_{ψ} and $MS_{\text{between x subject}}$. While not wrong, this was at odds with the confidence intervals of g_{ψ}, computed from the standard deviation of the contrast's difference score, $S_{D\psi}$. In other words, while the confidence intervals depended only on the groups participating in the contrast, F and p depended on all groups in the data set. Consequently, this could lead to the confusing situation of p and confidence intervals of g_{ψ} signalling contradictory messages, depending on the data. This is fixed; the user now has a choice (via new input parameter 'tDenom') between the two methods of computing F, p and confidence intervals of g_{ψ}, and the output of mes1way on the command line includes a note if the (probably) less common method is chosen. In the documentation, introductory notes to mes1way were added which explain the two methods in detail.
- if contrast weights containing more than one entry of zero are specified, a warning is issued because if this choice of weights reflects the user's wish to exclude groups from analysis it had better be done by eliminating the corresponding data prior to input to mes1way.

mes2way.m
- minor edits of H1 and help text
- main contrasts and MES depending on it were not computed correctly: they were too large by a factor of [number of levels in the non-analyzed factor]. This is fixed.
- when fed oneway data sets mes2way originally interpreted a (properly shaped) array of

contrast weights as an instruction to compute an interaction contrast, although a main contrast would have been more appropriate. This is now fixed.

mestab.m

- minor edits of H1 and help text

documentation

- addition of introductory notes to mes1way
- included table of input arguments
- minor edits

Version 1.0, first release (July 2011)