Package ‘metatest’

February 20, 2015

Type Package

Title Fit and test metaregression models

Version 1.0-4

Date 2013-01-24

Author Hilde M. Huizenga & Ingmar Visser

Maintainer Ingmar Visser <i.visser@uva.nl>

Description This package fits meta regression models and generates a number of statistics: next to t- and z-tests, the likelihood ratio, bartlett corrected likelihood ratio and permutation tests are performed on the model coefficients.

Depends R (>= 2.15.2)

License GPL

LazyLoad yes

Repository CRAN

Date/Publication 2013-01-25 14:18:11

NeedsCompilation no

R topics documented:

  metatest-package ........................................... 2
  metadat .................................................. 2
  metatest .................................................. 3
  transformations ......................................... 5

Index 7
metatest-package  

metatest fits and tests a metaregression model

Description

metatest fits and tests a metaregression model. In addition to the traditional z test on the estimated coefficients, metatest also yields more reliable statistics: the t-test, log likelihood ratio test, Bartlett corrected log likelihood ratio test, and the permutation test. The Bartlett corrected log likelihood ratio test and the permutation test are to be recommended since their type 1 errors are adequate. See metatest for details and an example.

Details

Package: metatest
Type: Package
Version: 1.0-2
Date: 2011-10-04
License: GPL
LazyLoad: yes

Author(s)

The code that does the hard work was written by Hilde Huizenga. Ingmar Visser added the interface functions and handled turning code into a package. Maintainer: Ingmar Visser <i.visser@uva.nl>

References


metadata

Example data for meta regression testing.

Description

Small example data set used in the example on the metatest help page.

Usage

data(metadata)
**Format**

A data frame with 6 observations on the following 3 variables.

- y The effect sizes.
- yvar The variances of the effect sizes.
- x A moderator variable.

**Source**

Data were randomly generated following an example in Huizenga et al (2011) below.

**References**


**Examples**

data(metadata)
metadata

---

**metatest**

metatest fits and tests a metaregression model

**Description**

metatest fits and tests a metaregression model. In addition to the traditional z test on the estimated coefficients, metatest also yields more reliable statistics: the t-test, log likelihood ratio test, Bartlett corrected log likelihood ratio test, and the permutation test. The Bartlett corrected log likelihood ratio test and the permutation test are to be recommended since their type 1 errors are adequate.

**Usage**

metatest(formula, variance, data, threshold = 1e-05, maxiter = 100, npermut = 1000, ...)

## S3 method for class 'metatest'
summary(object, digits = 4, ...)
## S3 method for class 'metatest'
print(x, ...)

---
Arguments

formula  

formula specifying the meta regression model; use y~x to specify a meta regression of effect sizes y moderated by x; the moderators can be either continuous or categorical variables; an intercept is included by default (use y~x-1 to drop the intercept); use y~1 for an intercept only model, i.e. a meta-analysis model.

variance  
The variances of the effect sizes to be modelled (a vector or a variable name interpreted in data).

data  
A data.frame to interpret the variables in arguments formula and variance.

threshold  
The threshold used in estimating the model; the threshold is the change in the value of the random effects variance parameter.

maxiter  
Maximum number of iterations allowed in estimating the model.

npermut  
Number of permutations performed by the permutation test.

object, x  
Object of class metatest.

digits  
Determines the number of digits to use in printing the results.

...  
Not currently used.

Details

The effect sizes to be analyzed can be of arbitrary type; some transformations between different effect size measures are provided. For many more see the package compute.es.

The print and summary methods are currently identical (this may change in the future), and print the random effects variance, the coefficients, and all the computed statistics and associated p-values.

Value

metatest returns an object of class metatest which is a named list with the following elements:

corvergence  
Convergence info; 0 indicates convergence; -1 signals that the estimator of between study variance was set to zero during estimation (with a warning).

iter  
Number of iterations used in optimizing the parameters.

variance  
Matrix with between study variance estimate, its associated log likelihood ratio statistic, df and p-value.

coefficients  
Estimated coefficients.

se  
Standard errors of the coefficients.

tval  
The t-ratios of the coefficients.

pZtest  
The p-values associated with the z-test.

dfttest  
The df’s associated with the t-tests.

pttest  
The p-values associated with the t-test.

LLR  
The log likelihood ratio statistics.

pLLR  
The p-values associated with the LLR statistics.

barrllr  
The Bartlett corrected LLR statistics.

bartscale  
The Bartlett scaling factor used to compute the corrected LLR statistics.

pbarrlett  
The p-values associated with the Bartlett corrected LLR statistics.

ppermtest  
The p-values of the permutation tests.

call  
The function call that created the metatest object.
transformation

Author(s)
Ingmar Visser & Hilde Huizenga. Maintainer: Ingmar Visser <i.visser@uva.nl>

References

Examples

data(metadata)
res <- metatest(y~x,yvar,data=metadata)
res

transformations

Transform effect sizes.

Description
Utility functions to transform various effect size measures into each other.

Usage
r2z(r)
r2d(r)
z2r(z)
z2d(z)

Arguments
r A correlation coefficient.
z A z-value, ie a normalized effect size.

Details
Transform effect sizes into correlations, (Cohen’s) d effect sizes, or z-distributed for performing meta regression.

Value
Return values are z, d or r values.

Author(s)
Ingmar Visser.
Examples

```r
## The function r2z is currently defined as
function(r) {
  return(0.5*(log(1+r)-log(1-r)))
}
```
Index

*Topic datasets
metadata, 2

*Topic htest
metatest, 3
metatest-package, 2

*Topic models
metatest, 3
metatest-package, 2

*Topic regression
metatest, 3
metatest-package, 2

*Topic univar
transformations, 5

formula, 4
metadata, 2
metatest, 2, 3
metatest-package, 2

print.metatest (metatest), 3

r2d(transformations), 5
r2z(transformations), 5

summary.metatest (metatest), 3

transformations, 4, 5

z2d(transformations), 5
z2r(transformations), 5