Package 'metapower'

April 7, 2020

Type Package

Title Power Analysis for Meta-Analysis

Version 0.1.0

Description A simple and effective tool for computing meta-analytic statistical power for main effects, tests of homogeneity, and categorical moderator models. All equations are described in Pigott (2012) <doi:10.1007/978-1-4614-2278-5>, Hedges & Pigott (2004) <doi:10.1037/1082-989X.9.4.426>, and Borenstein, Hedges, Higgins, & Rothstein (2009) <doi:10.1002/9780470743386>.

Depends R (>= 3.6)

License GPL-2

Encoding UTF-8

LazyData true

Imports cowplot (>= 1.0.0), dplyr (>= 0.8.5), ggplot2 (>= 3.3.0), knitr (>= 1.28), magrittr (>= 1.5), tidyr (>= 1.0.2), testthat (>= 2.3.2), rmarkdown (>= 2.1), rlang (>= 0.4.5)

VignetteBuilder knitr

RoxygenNote 7.1.0

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R topics documented:

homogen_power_plot *Plot Power Curve for Test of Homogeneity*

Description

Plot Power Curve for Test of Homogeneity

Usage

```
homogen_power_plot(obj)
```

Arguments

obj	should be an mpower object

Value

Power curve plot for the user specified input parameters

mod_power *Compute Power for Categorical Moderation Meta-analysis*

Description

Computes statistical power for categorical moderator models under fixed- and random-effects models

Usage

```
mod_power(
  n_groups,
  effect_sizes,
  sample_size,
  k,
  es_type,
  test_type = "two-tailed",
  p = 0.05,
  sd_within = NULL,
  con_table = NULL
)
```

Arguments

n_groups	Number of anticipated groups in moderation analysis
effect_sizes	Expected effect sizes of for each group.
sample_size	Expected number of participants (per group)
k	Total expected number of studies
es_type	'Correlation', 'd', or 'OR'
test_type	"two-tailed" or "one-tailed"
p	Significance level (Type I error probability)
sd_within	(Optional) For computing power for a test of homogeneity (within-groups). standard deviation of each group to the overall mean
con_table	(Optional) For Odds Ratio effect sizes. Expected 2x2 contingency table as a vector in the following format: c(a,b,c,d)

2x2 Table	Group 1	Group 2
Present	a	b
Not Present	c	d

Value

Estimated Power estimates for between and within-groups moderation

Examples

```
mod_power(
 n_groups = 3,
 effect_sizes = c(0,.1,.55),
 sample_size = 15,
 k = 15,
 es_type = "Correlation",
 sd_within = c(1,1,4),
 test_type = "two-tailed",
 p = .05)
```

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mpower *Compute Power for Meta-analysis*

Description

Computes statistical power for meta-analytic main effects, tests of homogeneity, and categorical moderator models under both fixed- and random-effects models.

Usage

```
mpower(
  effect_size,
  sample_size,
  k,
  es_type,
  test_type = "two-tailed",
  p = 0.05,
  sd = NULL,
  con_table = NULL
)
```

Arguments

effect_size	Expected effect size magnitude
sample_size	Expected number of participants (per group)
k	Expected number of studies
es_type	'Correlation', 'd', or 'OR'
test_type	"two-tailed" or "one-tailed"
p	Significance level (Type I error probability)
sd	(Optional) Fixed-effects models only: Expected standard deviation among all effect sizes
con_table	(Optional) For Odds Ratio. Expected 2x2 contingency table as a vector in the following format: c(a,b,c,d)

2x2 Table	Group 1	Group 2
Present	a	b
Not Present	c	d

Value

Estimated Power

References

Borenstein, M., Hedges, L. V., Higgins, J. P. T. and Rothstein, H. R.(2009). Introduction to meta-analysis, Chichester, UK: Wiley.

Hedges, L., Pigott, T. (2004). The Power of Statistical Tests for Moderators in Meta-Analysis Psychological Methods 9(4), 426-445. doi: https://dx.doi.org/10.1037/1082-989x.9.4.426

Pigott, T. (2012). Advances in Meta-Analysis. doi: https://dx.doi.org/10.1007/978-1-4614-2278-5

Examples

```
mpower(effect_size = .5, sample_size = 10, k = 10, es_type = "d")
```

power_plot *Plot Power Curve for Meta-analysis*

Description

Plot Power Curve for Meta-analysis

Usage

```
power_plot(obj)
```

Arguments

obj	This should be an mpower object

Value

Power curve plot for the user specified input parameters

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