Package: RSmallTelescopes (via r-universe)

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Title Empirical Small Telescopes Analysis

Version 1.0.4

Description We provide functions to perform an empirical small telescopes analysis. This package contains 2 functions, SmallTelescopes() and EstimatePower(). Users only need to call SmallTelescopes() to conduct the analysis. For more information on small telescopes analysis see Uri Simonsohn (2015) <doi:10.1177/0956797614567341>.

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LazyData true

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`EstimatePower` *Estimate Power*

Description

Estimate statistical power of an effect size parameter by simulation using original sample size.

Usage

```
EstimatePower(data, n.original, B.power, analysis, n.rows, alpha)
```

Arguments

`data`	Dataset (matrix).
`n.original`	The sample size of the original analysis (scalar).
`B.power`	The number of samples to be simulated (scalar).
`analysis`	Function to produce a p value and an effect size estimate.
`n.rows`	The number of rows per subject in the dataset (scalar)
`alpha`	Set alpha level for analysis (scalar)

Value

Power estimate generated through simulation (scalar).

Examples

```
# create or import dataset
 example.data <- matrix(rnorm(50), 25, 2)

# estimate statistical power
 EstimatePower(
   data = example.data,
   n.original = 10,
   analysis = function(data) {
     corr <- cor.test(data[,1], data[,2])
     return(list(effect.size = corr$estimate, p.value = corr$p.value))
   },
   B.power = 100,
   n.rows = 1,
   alpha = 0.05)
```

SmallTelescopes *Small Telescopes*

Description

Estimate statistical power for point estimate of effect size plus the lower and upper bounds of a confidence interval.

Usage

```
SmallTelescopes(
  data,
  analysis,
  n.original,
  B.CI = 10000,
  CI.level = 0.9,
  B.power = 10000,
  alpha = 0.05,
  n.rows = 1,
  seed = 1
)
```

Arguments

data	Dataset (matrix).
analysis	Function to produce a p value and an effect size estimate.
n.original	The sample size of the original analysis (scalar).
B.CI	The number of simulated samples used to construct CI (scalar); default = 10,000.
CI.level	The confidence level of the interval (scalar); default = .90.
B.power	The number of samples to be simulated (scalar); default = 10,000.
alpha	Set alpha level for analysis (scalar); default = 0.05.
n.rows	The number of rows per subject in the dataset (scalar); default = 1.
seed	Allows randomly generated numbers to be reproducible (scalar); default = 1.

Value

Displays statistical power for point estimate of an effect size plus the lower and upper bounds of a confidence interval. List contains the following components:

n.replication	The sample size of the replication analysis.
n.original	The sample size of the original analysis.
B.CI	The number of simulated samples used to construct CI.
CI.level	The confidence level of the interval.
B.power	The number of samples simulated.

p.value	The p value calculated from the replication data
es.estimate	Point estimate of effect size.
es.power	Estimated power for the point estimate of effect size.
CI.lower.estimate	Effect size estimate at the lower bound of the CI.
CI.lower.power	Estimated power for the lower bound of the CI.
CI.upper.estimate	Effect size estimate at the upper bound of the CI.
CI.upper.power	Estimated power for the upper bound of the CI.

Examples

```
# create or import dataset
 example.data <- matrix(rnorm(50), 25, 2)

# conduct empirical small telescopes analysis
 SmallTelescopes(
   data = example.data,
   analysis = function(data) {
     corr <- cor.test(data[,1], data[,2])
     return(list(effect.size = corr$estimate, p.value = corr$p.value))
   },
   n.original = 10,
   B.CI = 100,
   B.power = 100)
```

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