

Package ‘ridittools’

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Type Package

Title Useful Functions for Ridit Analysis

Version 0.1

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Description Functions to compute ridit scores of vectors, compute mean ridits and their standard errors for vectors compared to a reference vector, as described in Fleiss (1981, ISBN:0-471-06428-9), and compute means/SEs for multiple groups in matrices. Data can be either counts or proportions. Emphasis is on ridit analysis of ordered categorical data such as Likert items and pain-rating scales.

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ridittools-package *Useful Functions for Ridit Analysis*

Description

Functions to compute ridit scores of vectors, compute mean ridits and their standard errors for vectors compared to a reference vector, as described in Fleiss (1981, ISBN:0-471-06428-9), and compute means/SEs for multiple groups in matrices. Data can be either counts or proportions. Emphasis is on ridit analysis of ordered categorical data such as Likert items and pain-rating scales.

Details

The DESCRIPTION file:

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Version:     0.1
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LazyData:   TRUE
```

Index of help topics:

acc	Vehicle accident injuries
flu.age	Flu subtype by age group
handgun	Favorability of handgun ban by party
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meanridits	Compute mean ridits of multiple groups
riditsrefgroup	Utility to determine reference group. Primarily for internal use/
ridittools-package	Useful Functions for Ridit Analysis
semiauto	Favorability of semiautomatic weapons ban by party
seridit	Compute standard error of mean ridit for group given reference group
seriditdiff	Compute standard error of difference between two mean ridits
seridits	Compute standard errors of mean ridits of multiple groups
toridit	Compute ridit scores for group

Author(s)

Eric Bohlman

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References

Fleiss, Joseph L., (1981), Statistical Methods for Rates and Proportions. New York: John Wiley & Sons.

Examples

```
ref <- acc[ , 1]
toridit(ref)
g <- acc[ , 2]
meanridit(g, ref)
seridit(g, ref)
meanridits(flu.age, 2, "H3")
meanridits(flu.age, 2) # Uses group totals as reference
seridits(handgun, 2, 1)
```

acc

Vehicle accident injuries

Description

Counts of motor vehicle accident injuries; rows are ordered by increasing severity First column is total injuries for all drivers; second is injuries to slightly intoxicated drivers

Usage

```
acc
```

Format

7x2 matrix of counts

Source

Fleiss, pp. 152-153

Examples

```
acc
```

flu.age *Flu subtype by age group*

Description

Cross-tabulation of influenza virus subtypes by age group

Usage

flu.age

Format

4x5 matrix of counts; rows are age groups in increasing order, columns are viral subtypes

Source

<http://cdc.gov/flu/weekly> for week ending 24 Feb 2018

Examples

flu.age

handgun *Favorability of handgun ban by party*

Description

Likert ratings of American favorability toward a handgun ban, cross-tabulated by political party identification.

Usage

handgun

Format

5x4 matrix of counts; rows are ratings, first column is total responses, remaining columns are Democrats, independents, and Republicans.

Details

These data were originally specified as proportions and were derived by multiplication by sample sizes. As such, the first column slightly differs, due to rounding error, from the row sums of the remaining columns.

Source

YouGov poll of 1500 adult Americans, Feb. 25-27 2018

Examples

handgun

meanridit	<i>Compute mean ridit of group given reference group</i>
-----------	--

Description

Compute mean ridit for a group given a reference group

Usage

```
meanridit(v, ref)
```

Arguments

v	Vector of counts or proportions
ref	Vector of counts or proportions to use as reference group

Value

The group's mean ridit

Author(s)

Eric Bohlman

References

Fleiss, J.,L., (1981), Statistical Methods for Rates and Proportions. New York: John Wiley & Sons., p.153

Examples

```
# PolitiFact ratings in order of increasing truthfulness (8 Mar 2018)
obama <- c(9, 71, 70, 161, 165, 123)
trump <- c(77, 169, 114, 78, 60, 24)
# Probability that a random Trump statement is at least as truthful as a random Obama statement
meanridit(trump, obama)

## The function is currently defined as
function (v, ref)
{
  sum(to.ridit(ref) * v)/sum(v)
}
```

`meanridits`*Compute mean ridits of multiple groups*

Description

Computes mean ridits of multiple groups in a crosstab matrix. Groups can be either rows or columns, with the other dimension representing the response categories.

Usage

```
meanridits(x, margin, ref = NULL)
```

Arguments

<code>x</code>	matrix of cross-tabulated counts or proportions
<code>margin</code>	1 for groups in rows, 2 for groups in columns
<code>ref</code>	if omitted, use totals across groups as reference group if vector of counts (or proportions), use as reference group otherwise, number (or name if it exists) of group to use as reference

Value

vector of mean ridits

Note

using group totals as reference will not give meaningful results if data are proportions

Author(s)

Eric Bohlman

Examples

```
meanridits(flu.age, 2)
meanridits(flu.age, 2, "H3")
meanridits(handgun, 2, 1)
meanridits(handgun, 2, rowSums(handgun[, 2:4]))

## The function is currently defined as
function (x, margin, ref = NULL)
{
  apply(x, margin, meanridit, riditsrefgroup(x, margin, ref))
}
```

riditsrefgroup *Utility to determine reference group. Primarily for internal use/*

Description

For internal use.

Usage

```
riditsrefgroup(x, margin, ref = NULL)
```

Arguments

x	matrix of counts or proportions
margin	margin that represents groups. 1 for rows, 2 for columns
ref	group to use as reference. if omitted, use totals across groups. if a vector, use it. otherwise use the group with its number (or name if available)

Value

vector of counts/proportions to use as reference group

Author(s)

Eric Bohlman

Examples

```
## The function is currently defined as
function (x, margin, ref = NULL)
{
  if (length(ref) > 1) {
    refgroup <- ref
  }
  else if (length(ref) == 1) {
    if (margin == 1) {
      refgroup <- x[ref, ]
    }
    else {
      refgroup <- x[, ref]
    }
  }
  else {
    refgroup <- apply(x, 3 - margin, sum)
  }
}
```

 semiauto

Favorability of semiautomatic weapons ban by party

Description

Likert ratings of American favorability toward a ban on semi-automatic weapons, cross-tabulated by political party identification.

Usage

semiauto

Format

5x4 matrix of counts; rows are ratings, first column is total responses, remaining columns are Democrats, independents, and Republicans.

Details

These data were originally specified as proportions and were derived by multiplication by sample sizes. As such, the first column slightly differs, due to rounding error, from the row sums of the remaining columns.

Source

YouGov poll of 1500 adult Americans, Feb. 25-27 2018

Examples

semiauto

 seridit

Compute standard error of mean ridit for group given reference group

Description

Given a vector of counts for a group and a vector of counts for a reference group, computes the standard error of the mean ridit for the group.

Usage

seridit(v, ref)

Arguments

v same as meanridit(), but must be counts
 ref same as meanridit(), but must be counts

Value

standard error of mean ridit

Author(s)

Eric Bohlman

References

Fleiss, J.,L., (1981), Statistical Methods for Rates and Proportions. New York: John Wiley & Sons, p. 154

Examples

```
# PolitiFact ratings in order of increasing truthfulness (8 Mar 2018)
obama <- c(9, 71, 70, 161, 165, 123)
trump <- c(77, 169, 114, 78, 60, 24)
# Result is approximately standard normal
(meanridit(trump, obama) - 0.5) / seridit(trump, obama)

## The function is currently defined as
function (v, ref)
{
  N <- sum(ref)
  n <- sum(v)
  term1 <- (n + 1)/N
  term2 <- 1/(N * (N + n - 1))
  term3 <- sum((ref + v)^3)/(N * (N + n) * (N + n - 1))
  (1/(2 * sqrt(3 * n))) * sqrt(1 + term1 + term2 - term3)
}
```

seridits

Compute standard errors of mean ridits of multiple groups

Description

Takes the same data as meanridits(), but returns standard errors rather than means.

Usage

```
seridits(x, margin, ref = NULL)
```

Arguments

x	same as for meanridits(), but must be counts rather than proportions
margin	same as for meanridits()
ref	same as for meanridits()

Details

note that if the results include the reference group, its standard error will not be meaningful; by definition its mean ridit will be exactly 0.5

Value

a vector of standard errors for each group's mean ridits

Author(s)

Eric Bohlman

See Also

[meanridits](#)

Examples

```
(meanridits(semiauto, 2, 1) - 0.5) / seridits(semiauto, 2, 1)

## The function is currently defined as
function (x, margin, ref = NULL)
{
  apply(x, margin, se.ridit, riditsrefgroup(x, margin, ref))
}
```

seritdiff

Compute standard error of difference between two mean ridits

Description

Computes the approximate standard error of the difference between the mean ridits of two groups. This does not depend on the reference group the mean ridits are relative to, only on the sizes of the two groups.

Usage

```
seriditdiff(g1, g2)
```

Arguments

g1 vector of counts (not ridits) for first group
g2 vector of counts (not ridits) for second group

Details

the order of the two groups doesn't matter.

Value

approximate standard error of difference between mean ridits

Author(s)

Eric Bohlman

References

Fleiss, J.,L., (1981), Statistical Methods for Rates and Proportions. New York: John Wiley & Sons., p. 155

Examples

```
seriditdiff(semiauto[ , "Ind"], semiauto[ , "Rep"])

## The function is currently defined as
function(g1, g2) {
  sqrt(sum(g1) + sum(g2)) / (2 * sqrt(3 * sum(g1) * sum(g2)))
}
```

toridit

Compute ridit scores for group

Description

Computes the vector of ridit scores corresponding to a vector of counts or proportions.

Usage

```
toridit(v)
```

Arguments

v vector of counts or proportions

Value

vector of ridit scores

Author(s)

Eric Bohlman

References

Fleiss, J.,L., (1981), Statistical Methods for Rates and Proportions. New York: John Wiley & Sons, p. 152

Examples

```
# PolitiFact ratings for Barack Obama in order of increasing truthfulness (8 Mar 2018)
toridit(c(9, 71, 70, 161, 165, 123)) # counts
toridit(c(.02, .12, .12, .27, .28, .21)) # proportions

## The function is currently defined as
function (v)
{
  (cumsum(v) - 0.5 * v)/sum(v)
}
```

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