Package ‘rmcorr’

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Title Repeated Measures Correlation
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Description Compute the repeated measures correlation, a statistical technique for determining the overall within-individual relationship among paired measures assessed on two or more occasions, first introduced by Bland and Altman (1995). Includes functions for diagnostics, p-value, effect size with confidence interval including optional bootstrapping, as well as graphing. Also includes several example datasets.
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R topics documented:

rmcorr-package .................................................. 2
bland1995 .......................................................... 2
gilden2010 ......................................................... 3
plot.rmc ............................................................ 3
print.rmc ........................................................... 5
raz2005 .............................................................. 5
rmcorr .............................................................. 6
**Description**

Compute the repeated measures correlation, a statistical technique for determining the overall within-individual relationship among paired measures assessed on two or more occasions, first introduced by Bland and Altman (1995). Includes functions for diagnostics, p-value, effect size with confidence interval including optional bootstrapping, as well as graphing. Also includes several example datasets.

**Details**

details

**References**


**bland1995**


**Usage**

bland1995

**Format**

A data frame with 47 rows and 3 variables

- [1] Subject
- [2] pH
- [3] Pac02

**Source**

plot.rmc

Description

Plot the repeated measures correlation coefficient.

Usage

```r
# S3 method for class 'rmc'
plot( 
  x, 
  dataset = NULL, 
  overall = F, 
  palette = NULL, 
  xlab = NULL,
)```

plot.rmc

Description

plot.rmc produces a scatterplot of measure1 on the x-axis and measure2 on the y-axis, with a different color used for each subject. Parallel lines are fitted to each subject’s data.

Source


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gilden2010

Repeated measurements of reaction time and accuracy

Description

A dataset containing four repeated measurements of reaction time (RT) and accuracy from eleven subjects in a visual search experiment. Each measurement is the mean RT and accuracy from a block of 288 search trials. blocks of visual search, for eleven subjects.

Usage

`gilden2010`

Format

A data frame with 44 rows and 4 variables

```
[, 1] sub Subject ID
[, 2] block Block ID
[, 3] rt Mean reaction time
[, 4] acc Mean accuracy
```

Source

plot.rmc

ylab = NULL,
overall.col = "gray60",
overall.lwd = 3,
overall.lty = 2,
...
)

Arguments

x
an object of class "rmc" generated from the rmcorr function.
dataset
Deprecated: This argument is no longer required
overall
logical: if TRUE, plots the regression line between measure1 and measure2, ignoring the participant variable.
palette
the palette to be used. Defaults to the RColorBrewer "Paired" palette
xlab
label for the x axis, defaults to the variable name for measure1.
ylab
label for the y axis, defaults to the variable name for measure2.
overall.col
the color of the overall regression line
overall.lwd
the line thickness of the overall regression line
overall.lty
the line type of the overall regression line
...
additional arguments to plot.

See Also

rmcorr

Examples

## Bland Altman 1995 data
my.rmc <- rmcorr(participant = Subject, measure1 = PacO2, measure2 = pH, dataset = bland1995)
plot(my.rmc, overall = TRUE)

#using ggplot instead
ggplot2::ggplot(bland1995, ggplot2::aes(x = PacO2, y = pH, group = factor(Subject),
          color = factor(Subject))) +
  ggplot2::geom_point(ggplot2::aes(colour = factor(Subject))) +
  ggplot2::geom_line(ggplot2::aes(y = my.rmc$model$fitted.values), linetype = 1)

## Raz et al. 2005 data
my.rmc <- rmcorr(participant = Participant, measure1 = Age, measure2 = Volume, dataset = raz2005)
library(RColorBrewer)
blueset <- brewer.pal(8, 'Blues')
pal <- colorRampPalette(blueset)
plot(my.rmc, overall = TRUE, palette = pal, overall.col = 'black')

## Gilden et al. 2010 data
my.rmc <- rmcorr(participant = sub, measure1 = rt, measure2 = acc, dataset = gilden2010)
plot(my.rmc, overall = FALSE, lty = 2, xlab = "Reaction Time", ylab = "Accuracy")
print.rmc  

Print the results of a repeated measures correlation

Description

Print the results of a repeated measures correlation

Usage

## S3 method for class 'rmc'
print(x, ...)

Arguments

x  
An object of class "rmc", a result of a call to rmcorr.

...  
additional arguments to print.

See Also

rmcorr

Examples

## Bland Altman 1995 data
blandrmc <- rmcorr(Subject, PacO2, pH, bland1995)
blandrmc

---

raz2005  

Repeated measurements of age and cerebellar volume

Description

A dataset containing two repeated measures, on two occasions (Time), of age and adjusted volume of cerebellar hemispheres from 72 participants. Data were captured from Figure 8, Cerebellar Hemispheres (lower right) of Raz et al. (2005).

Usage

raz2005

Format

A data frame with 144 rows and 4 variables

```
[, 1] Participant  Participant ID
[, 2] Time        Measurement time
[, 3] Age         Participant's age (years)
[, 4] Volume      Adjusted volume of cerebellar hemispheres (cm^3)
```

### Description
Calculate the repeated measures correlation coefficient.

### Usage
```r
rmcorr(
  participant,
  measure1,
  measure2,
  dataset,
  CIs = c("analytic", "bootstrap"),
  nreps = 100,
  bstrap.out = F
)
```

### Arguments
- `participant`: A variable giving the subject name/id for each observation.
- `measure1`: A numeric variable giving the observations for one measure.
- `measure2`: A numeric variable giving the observations for the second measure.
- `dataset`: The data frame containing the variables.
- `CIs`: The method of calculating confidence intervals.
- `nreps`: The number of resamples to take if bootstrapping.
- `bstrap.out`: Determines if the output include the bootstrap resamples.

### Value
A list with class "rmc" containing the following components:
- `r`: the value of the repeated measures correlation coefficient.
- `df`: the degrees of freedom
- `p`: the p-value for the repeated measures correlation coefficient.
- `CI`: the 95% confidence interval for the repeated measures correlation coefficient.
- `model`: the multiple regression model used to calculate the correlation coefficient.
- `resamples`: the bootstrap resampled correlation values.
See Also

plot.rmc

Examples

## Bland Altman 1995 data
rmcorr(Subject, PacO2, pH, bland1995)
Index

bland1995, 2

gilden2010, 3

plot, 4
plot.rmc, 3, 7
print, 5
print.rmc, 5

raz2005, 5
rmcorr, 4, 5, 6
rmcorr-package, 2