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. For more details, see Bakdash and Marusich (2017) <doi:10.3389/fpsyg.2017.00456>.
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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. For more details, see Bakdash and Marusich (2017) <doi:10.3389/fpsyg.2017.00456>.

Details
details

References


bland1995

Repeated measurements of intramural pH and PaCO2

Description


Usage

bland1995

Format

A data frame with 47 rows and 3 variables

- [,1] Subject
- [,2] pH
- [,3] PacO2
**plot.rmc**

**Source**

**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**

*Plot the repeated measures correlation coefficient.*

**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.

**Usage**
```r
## S3 method for class 'rmc'
plot(
  x,
```
dataset = NULL,
overall = F,
palette = NULL,
xlab = NULL,
ylab = NULL,
overall.col = "gray60",
overall.lwd = 3,
overall.lty = 2,
...
)

Arguments

x an object of class "rmc" generated from the \texttt{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 \texttt{plot}.

See Also

\texttt{rmcorr}

Examples

```r
## 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')
```
print.rmc

## 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

```r
## 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

```r
## 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
rmcorr

**Calculate the repeated measures correlation coefficient.**

**Description**

Calculate the repeated measures correlation coefficient.

**Usage**

```r
rmcorr(
  participant, measure1, measure2, dataset,
  CI.level = 0.95,
  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.
- `CI.level`: The confidence level of the interval.
- `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.

**Source**

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.

References


See Also

- `plot.rmc`

Examples

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