Package 'BBcor'

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Type Package

Title Bayesian Bootstrapping Correlations

Version 1.0.3

Description Efficiently draw samples from the posterior distribution of various correlation coefficients with the Bayesian bootstrap described in Rubin (1981) <doi:10.1214/aos/1176345338>. There are six correlation coefficients, including Pearson, Kendall, Spearman, Gaussian Rank, Blomqvist, and polychoric.

Depends R (>= 4.0.0)

License GPL-2

Imports parallel, pbapply (>= 1.4-2), psych (>= 1.9.12.31), wdm (>= 0.2.1), ggplot2 (>= 3.3.4), stats, utils, methods, bayeslincom (>= 1.2.0), Rdpack

Suggests BGGM

RdMacros Rdpack

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R topics documented:

`bbcor` *Bayesian Bootstrapping Correlations*

Description

Efficiently draws samples from the posterior distribution of various correlation coefficients

Usage

```
bbcor(x, method = "pearson", iter = 5000, cores = 2)
```

Arguments

`x`	A matrix of dimensions *n* by *p*
`method`	Character string. Which correlation coefficient should be computed. One of "pearson" (default), "kendall", "spearman", "polychoric", "gaussian_rank", or "blomqvist" (i.e., median correlation).
`iter`	Numeric. How many posterior samples (defaults to `5000`) ?
`cores`	Numeric. How many cores for parallel computing (defaults to `2`)?

Value

- `cor_mean`: A matrix including the posterior mean
- `samps`: An array of dimensions `p` by `b` by `iter` that includes the sampled correlation matrices.

Note

NAs are removed.

Examples

```
Y <- mtcars[,1:2]

bb_samps <- bbcor(Y, method = "spearman")
```

compare *Compare Bayesian bootstrapped correlations*

Description

See lin_comb

Usage

```
compare(lin_comb, obj, cred = 0.9, rope = NULL, contrast = NULL)
```

Arguments

lin_comb	A string specifying a linear combination of variables, or a list of variable names if using contrast.
obj	An object of class BGGM, bbcor, or a data.frame of posterior samples.
cred	The level for which a credible interval should be computed.
rope	Specify a ROPE. Optional.
contrast	A contrast matrix specifying which combinations to test. Optional.

Value

An object of class bayeslincom

Examples

```
Y <- mtcars[, 1:3]
bb <- bbcor(Y)
bb_compare <- compare("mpg--cyl > mpg--disp",
                      obj = bb,
                      cred = 0.90,
                      rope = c(-0.1, 0.1))
bb_compare
```

cor_2_pcor *Correlation to Partial Correlation*

Description

Convert correlations into the corresponding partial correlations.

Usage

```
cor_2_pcor(x, ...)
```

Arguments

x	An object of class bbcor
...	Currently ignored

- pcor_mean: A matrix including the posterior mean.
- samps: An array of dimensions p by b by iter that includes the sampled partial correlation matrices.

Examples

```
Y <- mtcars[,1:3]

fit <- bbcor(Y, method = "spearman")

cor_2_pcor(fit)
```

---

plot.bayeslincom *Plot comparisons from* compare

Description

See plot.bayeslincom

Usage

```
## S3 method for class 'bayeslincom'
plot(
  x,
  point_col = "black",
  hist_col = "black",
  hist_fill = "gray",
  bar_col = "steelblue",
  bins = 30,
  display_comb_strings = TRUE,
  ...
)
```

Arguments

x	An object of class bayeslincom
point_col	Color for point indicating mean of posterior
hist_col	Color for histogram edges
hist_fill	Color for histogram bars
bar_col	Color of bar for credible interval
bins	Number of bins

display_comb_strings
: If TRUE, displays full strings for combinations in ggplot facets when there is more than one combination in x

...
: Currently ignored

Value

An object of class ggplot

Examples

```
Y <- mtcars[, 1:3]
bb <- bbcor(Y)
bb_compare <- compare("mpg--cyl > mpg--disp",
                      obj = bb,
                      cred = 0.90,
                      rope = c(-0.1, 0.1))
plot(bb_compare)
```

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plot.bbcor *Plot bbcor point estimates and intervals*

Description

Plot bbcor point estimates and intervals

Usage

```
## S3 method for class 'bbcor'
plot(x, ci = 0.9, point_col = "red", bar_col = "black", ...)
```

Arguments

x	An object of class bbcor
ci	Width of credible interval. Defaults to 0.9.
point_col	Color for point indicating mean of posterior
bar_col	Color of bar for credible interval
...	Currently ignored

Value

An object of class ggplot

Examples

```
Y <- mtcars[, 1:5]
bb <- bbcor(Y)
plot(bb)
```

posterior_samples *Extract Posterior Samples*

Description

Extract Posterior Samples

Usage

```
posterior_samples(object, ...)
```

Arguments

object	An object of class bbcor
...	Currently ignored

Value

A data frame including the posterior samples

Examples

```
Y <- mtcars[,1:5]

bb_samps <- bbcor(Y, method = "spearman")

# correlations
posterior_samples(bb_samps)


# partial correlations
posterior_samples(cor_2_pcor(bb_samps))
```

print.bayeslincom *Print formatted summary of a* bayeslincom *object*

Description

Print formatted summary of a bayeslincom object

Usage

```
## S3 method for class 'bayeslincom'
print(x, decimals = 2, ...)
```

Arguments

x	An object of class bayeslincom
decimals	The number of decimals points to which estimates should be rounded
...	Other arguments to be passed to print

Value

A formatted summary of posterior samples

---

print.bbcor *Print* bbcor *Objects*

Description

Print the correlation or partial correlation matrix

Usage

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

Arguments

x	An object of class bbcor
...	Currently ignored

---

srol2021 *Data on the social consequences of COVID-19 conspiracy beliefs*

Description

Data from Study 1 in (Å rol et al. 2021) examining effects of prejudice and descrimination on COVID-19 conspiracy beliefs

Usage

```
data("srol2021")
```

Format

A data frame with 501 rows and 24 variables

- `id`: participant id
- `gender`: participants' indicated gender (1 = "male", 2 = "female")
- `age`: participants' indicated age
- `education`: participants' indicated highest attained education level(1 = "elementary education", 2 = "high school without diploma", 3 = "high school with diploma", 4 = "undergraduate college degree", 5 = "graduate college degree", 6 = "doctoral degree")
- `combined_covid_conspiracy`: average rating on 12 items of both generic and China-specific COVID-19 conspiracy beliefs
- `china_covid_conspiracy`: average rating on 4 items of China-specific COVID-19 conspiracy beliefs
- `generic_covid_conspiracy`: average rating on 8 items of generic COVID-19 conspiracy beliefs
- `generic_covid_conspiracy_wo_hoax`: average rating on 7 items of generic COVID-19 conspiracy beliefs (without the hoax theory item)
- `combined_covid_conspiracy_wo_hoax`: average rating on 11 items of both generic and China-specific COVID-19 conspiracy beliefs (without the hoax theory item)
- `neg_feelings_italy`:score on a feeling thermometer (higher score = more negative feelings) toward Italian people/ 0-100
- `neg_feelings_china`:score on a feeling thermometer (higher score = more negative feelings) toward Chinese people/ 0-100
- `neg_feelings_roma`: score on a feeling thermometer (higher score = more negative feelings) toward Roma people/ 0-100
- `social_distance_italy`: average rating on three items of social distance toward Italian people
- `social_distance_china`: average rating on three items of social distance toward Chinese people
- `social_distance_roma`: average rating on three items of social distance toward Roma people
- `discrimination_italy`: rating on one discrimination item for Italian people
- `discrimination_china`: rating on one discrimination item for Chinese people
- `discrimination_roma`: rating on one discrimination item for Roma people
- `italy_composite`: composite average of 5 z-scores (feeling thermometer, 3 social distance items, and discrimination) for Italian people
- `china_composite`: composite average of 5 z-scores (feeling thermometer, 3 social distance items, and discrimination) for Chinese people
- `roma_composite`: composite average of 5 z-scores (feeling thermometer, 3 social distance items, and discrimination) for Roma people
- `information_exposure`: average rating on the 3 items of exposure to information about COVID-19 pandemic
- `anxiety`: average rating on the 4 items related to feelings of anxiety]
- `lack_of_control`: average rating on the 4 items related to the feeling of lack of control

Details

Further details can be found at https://osf.io/jkab7/

References

Å rol J, Cavojova V, MikuÅ¡kovÃ¡ EB (2021). "Social consequences of COVID-19 conspiracy beliefs: Evidence from two studies in Slovakia." *PsyArXiv*.

`summary.bbcor` *Summarize posterior samples from bbcor object*

Description

Summarize posterior samples from bbcor object

Usage

```
## S3 method for class 'bbcor'
summary(object, ci = 0.9, decimals = 2, ...)
```

Arguments

`object`	An object of class `bbcor`
`ci`	The desired credible interval
`decimals`	The number of decimals points to which estimates should be rounded
`...`	Currently ignored

Value

A `data.frame` summarizing the relations

Examples

```
Y <- mtcars[, 1:5]
bb <- bbcor(Y, method = "spearman")

summary(bb)
```

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