

# Package ‘BBcor’

June 20, 2021

**Type** Package

**Title** Bayesian Bootstrapping Correlations

**Version** 1.0.2

**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](https://doi.org/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 (>= 1.1.0), Rdpack

**Suggests** BGGM

**RdMacros** Rdpack

**Encoding** UTF-8

**LazyData** true

**RoxygenNote** 7.1.1

**NeedsCompilation** no

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**Repository** CRAN

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bbcor	<i>Bayesian Bootstrapping Correlations</i>
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### Description

Efficiently draws samples from the posterior distribution of various correlation coefficients

### Usage

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

### Arguments

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

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compare	<i>Compare Bayesian bootstrapped correlations</i>
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**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
```

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cor_2_pcor	<i>Correlation to Partial Correlation</i>
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**Description**

Convert correlations into the corresponding partial correlations.

**Usage**

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

**Arguments**

x	An object of class bbcor
...	Currently ignored
	<ul style="list-style-type: none"> <li>• pcor_mean: A matrix including the posterior mean.</li> <li>• sampls: An array of dimensions p by b by iter that includes the sampled partial correlation matrices.</li> </ul>

**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)

```

---

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 <- BGM::ptsd
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))
```

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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 <code>bbcor</code>
...	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

Årol J, Cavojova V, MikuÅkovÃi EB (2021). "Social consequences of COVID-19 conspiracy beliefs: Evidence from two studies in Slovakia." *PsyArXiv*.

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summary.bbcor

*Summarize posterior samples from bbcor object*

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## Description

Summarize posterior samples from bbcor object

## Usage

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

## Arguments

<code>object</code>	An object of class <code>bbcort</code>
<code>ci</code>	The desired credible interval
<code>...</code>	Currengly ignroed



**Value**

A data.frame summarizing the relations

**Examples**

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

summary(bb_samps)
```

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