

# Package ‘ppcor’

October 14, 2022

**Type** Package

**Title** Partial and Semi-Partial (Part) Correlation

**Version** 1.1

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**Depends** R (>= 2.6.0), MASS

**Description** Calculates partial and semi-partial  
(part) correlations along with p-value.

**License** GPL-2

**NeedsCompilation** no

**Repository** CRAN

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## R topics documented:

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ppcor-package	<i>Partial and Semi-partial (Part) Correlation</i>
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## Description

Calculates parital and semi-partial (part) correlations along with p value.

## Details

Package: ppcor  
 Type: Package  
 Version: 1.0  
 Date: 2011-06-14  
 License: GPL-2

### Author(s)

Seongho Kim <biostatistician.kim@gmail.com>

### References

Kim, S. (2015) ppcor: An R Package for a Fast Calculation to Semi-partial Correlation Coefficients. Communications for Statistical Applications and Methods, 22(6), 665-674.

### Examples

```

# data
y.data <- data.frame(
  h1=c(7,15,19,15,21,22,57,15,20,18),
  disp=c(0.000,0.964,0.000,0.000,0.921,0.000,0.000,1.006,0.000,1.011),
  deg=c(9,2,3,4,1,3,1,3,6,1),
  BC=c(1.78e-02,1.05e-06,1.37e-05,7.18e-03,0.00e+00,0.00e+00,0.00e+00
        ,4.48e-03,2.10e-06,0.00e+00)
)
# partial correlation
pcor(y.data)

# partial correlation between "h1" and "disp" given "deg" and "BC"
pcor.test(y.data$h1,y.data$disp,y.data[,c("deg","BC")])
pcor.test(y.data[,1],y.data[,2],y.data[,c(3:4)])
pcor.test(y.data[,1],y.data[,2],y.data[,~c(1:2)])

# semi-partial (part) correlation
spcor(y.data)

# semi-partial (part) correlation between "h1" and "disp" given "deg" and "BC"
spcor.test(y.data$h1,y.data$disp,y.data[,c("deg","BC")])
spcor.test(y.data[,1],y.data[,2],y.data[,c(3:4)])
spcor.test(y.data[,1],y.data[,2],y.data[,~c(1:2)])

```

---

pcor *Partial correlation*

---

### Description

The function `pcor` can calculate the pairwise partial correlations for each pair of variables given others. In addition, it gives us the p value as well as statistic for each pair of variables.

### Usage

```
pcor(x, method = c("pearson", "kendall", "spearman"))
```

### Arguments

<code>x</code>	a matrix or data fram.
<code>method</code>	a character string indicating which partial correlation coefficient is to be computed. One of "pearson" (default), "kendall", or "spearman" can be abbreviated.

### Details

Partial correlation is the correlation of two variables while controlling for a third or more other variables. When the determinant of variance-covariance matrix is numerically zero, Moore-Penrose generalized matrix inverse is used. In this case, no p-value and statistic will be provided if the number of variables are greater than or equal to the sample size.

### Value

<code>estimate</code>	a matrix of the partial correlation coefficient between two variables
<code>p.value</code>	a matrix of the p value of the test
<code>statistic</code>	a matrix of the value of the test statistic
<code>n</code>	the number of samples
<code>gn</code>	the number of given variables
<code>method</code>	the correlation method used

### Note

Missing values are not allowed.

### Author(s)

Seongho Kim <<biostatistician.kim@gmail.com>>

### References

Kim, S. (2015) ppcor: An R Package for a Fast Calculation to Semi-partial Correlation Coefficients. *Communications for Statistical Applications and Methods*, 22(6), 665-674.

**See Also**

[pcor.test](#), [spcor](#), [spcor.test](#)

**Examples**

```
# data
y.data <- data.frame(
  hl=c(7,15,19,15,21,22,57,15,20,18),
  disp=c(0.000,0.964,0.000,0.000,0.921,0.000,0.000,1.006,0.000,1.011),
  deg=c(9,2,3,4,1,3,1,3,6,1),
  BC=c(1.78e-02,1.05e-06,1.37e-05,7.18e-03,0.00e+00,0.00e+00,0.00e+00
        ,4.48e-03,2.10e-06,0.00e+00)
)
# partial correlation
pcor(y.data)
```

---

pcor.test

*Partial correlation for two variables given a third variable.*

---

**Description**

The function `pcor.test` can calculate the pairwise partial correlations between two variables. In addition, it gives us the p value as well as statistic.

**Usage**

```
pcor.test(x, y, z, method = c("pearson", "kendall", "spearman"))
```

**Arguments**

x	a numeric vector.
y	a numeric vector.
z	a numeric vector.
method	a character string indicating which partial correlation coefficient is to be computed. One of "pearson" (default), "kendall", or "spearman" can be abbreviated.

**Details**

Partial correlation is the correlation of two variables while controlling for a third variable. When the determinant of variance-covariance matrix is numerically zero, Moore-Penrose generalized matrix inverse is used. In this case, no p-value and statistic will be provided if the number of variables are greater than or equal to the sample size.

**Value**

estimate	the partial correlation coefficient between two variables
p.value	the p value of the test
statistic	the value of the test statistic
n	the number of samples
gn	the number of given variables
method	the correlation method used

**Note**

Missing values are not allowed

**Author(s)**

Seongho Kim <<biostatistician.kim@gmail.com>>

**References**

Kim, S. (2015) ppcor: An R Package for a Fast Calculation to Semi-partial Correlation Coefficients. Communications for Statistical Applications and Methods, 22(6), 665-674.

**See Also**

[pcor](#), [spcor](#), [spcor.test](#)

**Examples**

```
# data
y.data <- data.frame(
  h1=c(7,15,19,15,21,22,57,15,20,18),
  disp=c(0.000,0.964,0.000,0.000,0.921,0.000,0.000,1.006,0.000,1.011),
  deg=c(9,2,3,4,1,3,1,3,6,1),
  BC=c(1.78e-02,1.05e-06,1.37e-05,7.18e-03,0.00e+00,0.00e+00,0.00e+00
        ,4.48e-03,2.10e-06,0.00e+00)
)

# partial correlation between "h1" and "disp" given "deg" and "BC"
pcor.test(y.data$h1,y.data$disp,y.data[,c("deg","BC")])
pcor.test(y.data[,1],y.data[,2],y.data[,c(3:4)])
pcor.test(y.data[,1],y.data[,2],y.data[,~c(1:2)])
```

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 spcor

*Semi-partial (part) correlation*


---

### Description

The function `spcor` can calculate the pairwise semi-partial (part) correlations for each pair of variables given others. In addition, it gives us the p value as well as statistic for each pair of variables.

### Usage

```
spcor(x, method = c("pearson", "kendall", "spearman"))
```

### Arguments

<code>x</code>	a matrix or data fram.
<code>method</code>	a character string indicating which semi-partial (part) correlation coefficient is to be computed. One of "pearson" (default), "kendall", or "spearman" can be abbreviated.

### Details

Semi-partial correlation is the correlation of two variables with variation from a third or more other variables removed only from the second variable. When the determinant of variance-covariance matrix is numerically zero, Moore-Penrose generalized matrix inverse is used. In this case, no p-value and statistic will be provided if the number of variables are greater than or equal to the sample size.

### Value

<code>estimate</code>	a matrix of the semi-partial (part) correlation coefficient between two variables
<code>p.value</code>	a matrix of the p value of the test
<code>statistic</code>	a matrix of the value of the test statistic
<code>n</code>	the number of samples
<code>gn</code>	the number of given variables
<code>method</code>	the correlation method used

### Note

Missing values are not allowed.

### Author(s)

Seongho Kim <<biostatistician.kim@gmail.com>>

## References

Kim, S. (2015) ppcor: An R Package for a Fast Calculation to Semi-partial Correlation Coefficients. Communications for Statistical Applications and Methods, 22(6), 665-674.

## See Also

[spcor.test](#), [pcor](#), [pcor.test](#)

## Examples

```
# data
y.data <- data.frame(
  h1=c(7,15,19,15,21,22,57,15,20,18),
  disp=c(0.000,0.964,0.000,0.000,0.921,0.000,0.000,1.006,0.000,1.011),
  deg=c(9,2,3,4,1,3,1,3,6,1),
  BC=c(1.78e-02,1.05e-06,1.37e-05,7.18e-03,0.00e+00,0.00e+00,0.00e+00
        ,4.48e-03,2.10e-06,0.00e+00)
)

# semi-partial (part) correlation
spcor(y.data)
```

---

spcor.test	<i>Semi-partial (part) correlation for two variables given a third variable.</i>
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## Description

The function `spcor.test` can calculate the pairwise semi-partial (part) correlations between two variables. In addition, it gives us the p value as well as statistic.

## Usage

```
spcor.test(x, y, z, method = c("pearson", "kendall", "spearman"))
```

## Arguments

x	a numeric vector.
y	a numeric vector.
z	a numeric vector.
method	a character string indicating which partial correlation coefficient is to be computed. One of "pearson" (default), "kendall", or "spearman" can be abbreviated.

## Details

Semi-partial correlation is the correlation of two variables with variation from a third variable removed only from the second variable. When the determinant of variance-covariance matrix is numerically zero, Moore-Penrose generalized matrix inverse is used. In this case, no p-value and statistic will be provided if the number of variables are greater than or equal to the sample size.

**Value**

estimate	the semi-partial (part) correlation coefficient between two variables
p.value	the p value of the test
statistic	the value of the test statistic
n	the number of samples
gn	the number of given variables
method	the correlation method used

**Note**

Missing values are not allowed

**Author(s)**

Seongho Kim <<biostatistician.kim@gmail.com>>

**References**

Kim, S. (2015) ppcor: An R Package for a Fast Calculation to Semi-partial Correlation Coefficients. Communications for Statistical Applications and Methods, 22(6), 665-674.

**See Also**

[spcor](#), [pcor](#), [pcor.test](#)

**Examples**

```
# data
y.data <- data.frame(
  h1=c(7,15,19,15,21,22,57,15,20,18),
  disp=c(0.000,0.964,0.000,0.000,0.921,0.000,0.000,1.006,0.000,1.011),
  deg=c(9,2,3,4,1,3,1,3,6,1),
  BC=c(1.78e-02,1.05e-06,1.37e-05,7.18e-03,0.00e+00,0.00e+00,0.00e+00
        ,4.48e-03,2.10e-06,0.00e+00)
)

# semi-partial (part) correlation between "h1" and "disp" given "deg" and "BC"
spcor.test(y.data$h1,y.data$disp,y.data[,c("deg","BC")])
spcor.test(y.data[,1],y.data[,2],y.data[,c(3:4)])
spcor.test(y.data[,1],y.data[,2],y.data[, -c(1:2)])
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