Package 'diffcor'

August 25, 2022

Type Package

Title Fisher's z-Tests Concerning Difference of Correlations

Version 0.7.2

Date 2022-08-25

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Description Computations of Fisher's z-tests concerning differences between correlations. diffcor.one() tests whether an expected value differs from an observed value, for example, in construct validation. diffcor.two() tests whether the correlation between two constructs differed across two studies/samples. diffcor.dep() checks whether the correlation between two constructs (r12) is significantly different from the correlation between the first construct with a third one (r13), given the intercorrelation of the compared constructs (r23). All outputs provide the compared correlations, test statistic in z-units, and p-values. For diffcor.one() and diffcor.two(), the output further provides confidence intervals of the empirical correlations and the effect size Cohens q. According to Cohen (1988), q = |.10|, |.30| and |.50| are considered small, moderate, and large differences, respectively.

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Encoding UTF-8

NeedsCompilation no

Repository CRAN

Date/Publication 2022-08-25 08:12:37 UTC

R topics documented:

`diffcor.dep` *Fisher's z-Tests of dependent correlations*

Description

The function checks if the correlation between two variables (r12) differs from the correlation between the first and a third one (r13), given the intercorrelation of the compared constructs (r23). The output provides the compared correlations, test statistic as z-score, and p-values.

Usage

```
diffcor.dep(r12, r13, r23, n, cor.names = NULL,
alternative = c("one.sided", "two.sided"), digit = 3)
```

Arguments

`r12`	Correlation between the first and the second construct
`r13`	Correlation between the first and the third construct
`r23`	Correlation between the second and the third construct
`n`	Sample size in which the observed effect was found
`cor.names`	OPTIONAL, label for the correlation. DEFAULT is NULL
`alternative`	A character string specifying if you wish to test one-sided or two-sided differences
`digit`	Number of digits in the output for all parameters, DEFAULT = 3

Value

`r12`	Vector of the empirically observed correlations between the first and the second construct
`r13`	Vector of the empirically observed correlations between the first and the third construct
`r23`	Vector of the empirically observed correlations between the second and the third construct
`z`	Test statistic for correlation difference in units of z distribution
`p`	p value for one- or two-sided testing, depending on alternative = c("one.sided", "two.sided)

Author(s)

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References

Cohen, J. (1988). Statistical power analysis for the behavioral sciences (2nd ed.). Lawrence Erlbaum.

Eid, M., Gollwitzer, M., & Schmitt, M. (2015). Statistik und Forschungsmethoden (4.Auflage) [Statistics and research methods (4th ed.)]. Beltz.

Steiger, J. H. (1980). Tests for comparing elements of a correlation matrix. Psychological Bulletin, 87, 245-251.

Examples

```
diffcor.dep(r12 = .76, r13 = .70, r23 = .50, n = 271, digit = 4,
cor.names = NULL, alternative = "two.sided")
```

`diffcor.one` *Fisher's z-test of difference between an empirical and a hypothesized correlation*

Description

The function tests whether an observed correlation differs from an expected one, for example, in construct validation. The output provides the compared correlations, a z-score, a p-value, a confidence interval, and the effect size Cohens q. According to Cohen (1988), q = |.10|, |.30| and |.50| are considered small, moderate, and large differences, respectively.

Usage

```
diffcor.one(emp.r, hypo.r, n, alpha = .05, cor.names = NULL,
alternative = c("one.sided", "two.sided"), digit = 3)
```

Arguments

`emp.r`	Empirically observed correlation
`hypo.r`	Hypothesized correlation which shall be tested
`n`	Sample size in which the observed effect was found
`alpha`	Likelihood of Type I error, DEFAULT = .05
`cor.names`	OPTIONAL, label for the correlation (e.g., "IQ-performance"). DEFAULT is NULL
`digit`	Number of digits in the output for all parameters, DEFAULT = 3
`alternative`	A character string specifying if you wish to test one-sided or two-sided differences

Value

r_exp	Vector of the expected correlations
r_obs	Vector of the empirically observed correlations
LL	Lower limit of the confidence interval of the empirical correlation, given the specified alpha level, DEFAULT = 95 percent
UL	Upper limit of the confidence interval of the empirical correlation, given the specified alpha level, DEFAULT = 95 percent
z	Test statistic for correlation difference in units of z distribution
p	p value for one- or two-sided testing, depending on alternative = c("one.sided", "two.sided)
Cohen_q	Effect size measure for differences of independent correlations

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References

Cohen, J. (1988). Statistical power analysis for the behavioral sciences (2nd ed.). Lawrence Erlbaum.

Eid, M., Gollwitzer, M., & Schmitt, M. (2015). Statistik und Forschungsmethoden (4.Auflage) [Statistics and research methods (4th ed.)]. Beltz.

Steiger, J. H. (1980). Tests for comparing elements of a correlation matrix. Psychological Bulletin, 87, 245-251.

Examples

```
diffcor.one(c(.76, .53, -.32), c(.70, .35, -.40),
  c(225, 250, 210),
  cor.names = c("a-b", "c-d", "e-f"), digit = 2, alternative = "one.sided")
```

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diffcor.two *Fisher's z-Tests for differences of correlations in two independent samples*

Description

The function tests whether the correlation between two variables differs across two independent studies/samples. The output provides the compared correlations, test statistic as z-score, p-values, confidence intervals of the empirical correlations, and the effect size Cohens q. According to Cohen (1988), q = |.10|, |.30| and |.50| are considered small, moderate, and large differences, respectively.

Usage

```
diffcor.two(r1, r2, n1, n2, alpha = .05, cor.names = NULL,
alternative = c("one.sided", "two.sided"), digit = 3)
```

Arguments

r1	Correlation coefficient in first sample
r2	Correlation coefficient in second sample
n1	First sample size
n2	Second sample size
alpha	Likelihood of Type I error, DEFAULT = .05
cor.names	OPTIONAL, label for the correlation (e.g., "IQ-performance"). DEFAULT is NULL
digit	Number of digits in the output for all parameters, DEFAULT = 3
alternative	A character string specifying if you wish to test one-sided or two-sided differences

Value

r1	Vector of the empirically observed correlations in the first sample
r2	Vector of the empirically observed correlations in the second sample
LL1	Lower limit of the confidence interval of the first empirical correlation, given the specified alpha level, DEFAULT = 95 percent
UL1	Upper limit of the confidence interval of the first empirical correlation, given the specified alpha level, DEFAULT = 95 percent
LL2	Lower limit of the confidence interval of the second empirical correlation, given the specified alpha level, DEFAULT = 95 percent
UL2	Upper limit of the confidence interval of the second empirical correlation, given the specified alpha level, DEFAULT = 95 percent
z	Test statistic for correlation difference in units of z distribution
p	p value for one- or two-sided testing, depending on alternative = c("one.sided", "two.sided)
Cohen_q	Effect size measure for differences of independent correlations

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References

Cohen, J. (1988). Statistical power analysis for the behavioral sciences (2nd ed.). Lawrence Erlbaum.

Eid, M., Gollwitzer, M., & Schmitt, M. (2015). Statistik und Forschungsmethoden (4.Auflage) [Statistics and research methods (4th ed.)]. Beltz.

Steiger, J. H. (1980). Tests for comparing elements of a correlation matrix. Psychological Bulletin, 87, 245-251.

Examples

```
diffcor.two(r1 = c(.39, .52, .22),
  r2 = c(.29, .44, .12),
  n1 = c(66, 66, 66), n2 = c(96, 96, 96), alpha = .01,
  cor.names = c("a-b", "c-d", "e-f"), alternative = "one.sided")
```

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