Package ‘diffcor’

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Type Package

Title Fisher's z-Tests Concerning Difference of Correlations

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Description Computations of Fisher's z-tests concerning differences between correlations. diffcor.one() could be used to test for differences regarding an expected value, e.g., in construct validation. diffcor.two() may be useful in replication studies, to test if the original study and the replication study differed in terms of effects. diffcor.dep() can be applied to check if the correlation between one construct with another one (r12) is significantly different/higher/smaller than the correlation of one of the constructs with a third construct (r13), given the correlation of the constructs that are compared (r23). The outputs for all the three functions provide the test statistic in z-units as well as p-values. For diffcor.one() and diffcor.two(), the effect size Cohens q is additionally printed. It is a descriptive index to evaluate differences of independent correlations. Cohen (1988) suggested q = |.10|, |.30| and |.50| as small, moderate, and large differences.

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`diffcor` *Fisher's z-Tests Concerning Difference of Correlations*

Description

Computations of Fisher's z-tests concerning differences between correlations.

diffcor.one() could be used to test for differences regarding an expected value, e.g., in construct validation.

diffcor.two() may be useful in replication studies, to test if the original study and the replication study differed in terms of effects.

diffcor.dep() can be applied to check if the correlation between one construct with another one (r12) is significantly different/higher/smaller than the correlation of one of the constructs with a third construct (r13), given the correlation of the constructs that are compared (r23).

The outputs for all the three functions provide the test statistic in z-units as well as p-values. For diffcor.one() and diffcor.two(), the effect size Cohens q is additionally provided. It is a descriptive index to evaluate differences of independent correlations. Cohen (1988) suggested q = |.10|, |.30| and |.50| as small, moderate, and large differences.

Usage

```
diffcor.one(emp.r, hypo.r, n, cor.names = NULL, alternative = c("one.sided", "two.sided"))
diffcor.two(r1, r2, n1, n2, cor.names = NULL, alternative = c("one.sided", "two.sided"))
diffcor.dep(r12, r13, r23, n, cor.names = NULL, alternative = c("one.sided", "two.sided"))
```

Arguments

`emp.r`	empirically observed correlation
`hypo.r`	hypothesized correlation which shall be tested
`n`	sample size in which the observed effect was found
`cor.names`	Label for the respective correlation (e.g., "IQ-performance""). This is especially advantageous if you test a series of correlations simultaneously, see examples. Per default, cor.names is NULL
`alternative`	a character string to specify if you wish to test one-sided or two-sided differences
`r1`	first correlation coefficient
`r2`	second correlation coefficient
`n1`	sample size the first correlation coeffient is based on
`n2`	sample size the second correlation coeffient is based on
`r12`	correlation between first and second construct
`r13`	correlation between first and third construct
`r23`	correlation between second and third construct

Value

`Fisher z`	test statistic for correlation difference in units of the standard normal distribution
`p value`	p-value for one- or two-sided testing, depending on alternative = c("one.sided", "two.sided)
`Cohen's q`	effect size measure for differences of independent correlations

Author(s)

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References

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

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

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

Examples

```
# empirically observed r = .76, expected r = .70, sample size n = 271
diffcor.one(.76, .70, 271, cor.names = NULL, alternative = "two.sided")

# works also with a dataframe of correlations.

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

# same applies to the functions diffcor.two() and diffcor.dep()

diffcor.two(r1 = .76, r2 = .70, n1 = 271, n2 = 323, cor.names = NULL, alternative = "one.sided")

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

diffcor.two(r1 = c(.39, .52, .22),
  r2 = c(.29, .44, .12),
  n1 = c(66, 66, 66),
  n2 = c(96, 96, 96),
  cor.names = NULL, alternative = "one.sided")

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

diffcor.dep(r12 = c(.76, .54, .22),
  r13 = c(.24, .01, .07), r23 = c(.25, .65, .90),
```

```
  n = c(500, 392, 92), cor.names = c("a-b", "c-d", "e-f"), alternative = "one.sided")

diffcor.dep(r12 = c(.76, .54, .22),
  r13 = c(.24, .01, .07),
  r23 = c(.25, .65, .90),
  n = c(500, 392, 92), cor.names = NULL, alternative = "one.sided")
```

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