Package 'simpr.interaction'

March 22, 2025

Type Package

Title Calculating Parameters for Simulation-Based Regression
Interaction Power Analysis

Version 0.1.0

Description Provides functionality for analytically calculating parameters (via the
'InteractionPoweR' package) useful for simulation of moderated multiple
regression, based on the correlations among the predictors and outcome and
the reliability of predictors.

Imports InteractionPoweR

License GPL-2

Encoding UTF-8

URL https://github.com/statisfactions/simpr.interaction/

BugReports https://github.com/statisfactions/simpr.interaction/issues/

RoxygenNote 7.2.3

NeedsCompilation no

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Repository CRAN

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interaction_params   *Extract simulation parameters for power analysis of regression inter-*
                          action models.

Description

Extract useful simulation parameters for regression.interaction models, computed via change in
R2. This function is largely a wrapper for [power_interaction_r2()](#) from the InteractionPoweR
package which calculates useful quantities based on correlations and reliabilities. This function
then massages the output into a more convenient format for simpr as well as calculating R2 and
sigma.

Usage

```
interaction_params(
  r.x1.y,
  r.x2.y,
  r.x1x2.y,
  r.x1.x2,
  rel.x1 = 1,
  rel.x2 = 1,
  rel.y = 1
)
```

Arguments

r.x1.y	Pearson's correlation between x1 and y. Must be between -1 and 1.
r.x2.y	Pearson's correlation between x2 and y. Must be between -1 and 1. Assumed to be the 'moderator' in some functions.
r.x1x2.y	Pearson's correlation between the interaction term x1x2 (x1 * x2) and y. Must be between -1 and 1.
r.x1.x2	Pearson's correlation between x1 and x2. Must be between -1 and 1. Has no default value.
rel.x1	Reliability of x1 (e.g. test-retest reliability, ICC, Cronbach's alpha). Default is 1 (perfect reliability). Must be greater than 0 and less than or equal to 1.
rel.x2	Reliability of x2 (e.g. test-retest reliability, ICC, Cronbach's alpha). Default is 1 (perfect reliability). Must be greater than 0 and less than or equal to 1.
rel.y	Reliability of y (e.g. test-retest reliability, ICC, Cronbach's alpha). Default is 1 (perfect reliability). Must be greater than 0 and less than or equal to 1.

Value

A list with the following elements:

b1:	Slope for simulation of x1
b2:	Slope for simulation of x2

`b3:`	Slope for simulation of x1:x2
`obs.r.x1.x2:`	Adjusted correlation of x1 and x2
`obs.r.x1.y:`	Adjusted correlation of x1 and y
`obs.r.x2.y:`	Adjusted correlation of x1 and y
`obs.r.x1x2.y:`	Adjusted correlation of x1:x2 and y
`r2:`	R-squared
`sigma:`	Sigma
`cov:`	Adjusted correlation matrix of x1 and x2

Examples

```
params_all = interaction_params(r.x1.y = -0.18,
 r.x2.y = -0.03,
 r.x1.x2 = 0.64,
 r.x1x2.y = 0.1,
 rel.y = 0.79,
 rel.x1 = 0.89,
 rel.x2 = 0.95)
```

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