Package 'gtheoryr'

May 8, 2026

Type Package

Title Simple Generalizability Theory for Crossed and Nested Designs

Version 0.1.0

Description Provides a small, beginner-friendly interface for estimating variance components in simple generalizability theory designs. The package currently supports a fully crossed persons-by-items design and a simple items-within-person nested design, along with design-study summaries for relative and absolute decisions.

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Encoding UTF-8

RoxygenNote 7.3.2

NeedsCompilation no

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Repository CRAN

Date/Publication 2026-03-19 13:50:10 UTC

Contents

gtheoryr-package *gtheoryr: Simple Generalizability Theory for R*

Description

Small, beginner-friendly helpers for estimating variance components in simple generalizability theory designs. The package currently supports:

- a crossed persons-by-items design via `gstudy_pxi()`
- a nested items-within-person design via `gstudy_nested_ip()`
- simple D-studies via `dstudy_pxi()` and `dstudy_nested_ip()`

dstudy_nested_ip *Design Study for a Nested Items-within-Person Design*

Description

Computes a simple reliability summary for a proposed number of nested items per person.

Usage

```
dstudy_nested_ip(gstudy, n_items = gstudy$n_items)
```

Arguments

`gstudy`	A result from `gstudy_nested_ip()`.
`n_items`	Number of nested items per person in the proposed design.

Value

An object of class `"dstudy_gtheoryr"`.

Examples

```
nested_scores <- data.frame(
  person = c("P1", "P1", "P2", "P2", "P3", "P3"),
  item = c("P1_I1", "P1_I2", "P2_I1", "P2_I2", "P3_I1", "P3_I2"),
  score = c(8, 6, 5, 4, 9, 7)
)

gs_nested <- gstudy_nested_ip(
  nested_scores,
  person = "person",
  item = "item",
  score = "score"
)
dstudy_nested_ip(gs_nested, n_items = 4)
```

dstudy_pxi *Design Study for a Crossed Persons-by-Items Design*

Description

Computes relative error, absolute error, a generalizability coefficient, and a phi coefficient for a proposed number of items.

Usage

```
dstudy_pxi(gstudy, n_items = gstudy$n_items)
```

Arguments

gstudy	A result from gstudy_pxi().
n_items	Number of items in the proposed design.

Value

An object of class "dstudy_gtheoryr".

Examples

```
scores <- data.frame(
  person = rep(c("P1", "P2", "P3"), each = 3),
  item = rep(c("I1", "I2", "I3"), times = 3),
  score = c(8, 7, 9, 5, 4, 6, 7, 6, 8)
)

gs <- gstudy_pxi(scores, person = "person", item = "item", score = "score")
dstudy_pxi(gs, n_items = 6)
```

gstudy_nested_ip *Estimate Variance Components for a Nested Items-within-Person Design*

Description

Estimates ANOVA mean squares and variance components for a simple balanced nested design in which each person has their own set of items.

Usage

```
gstudy_nested_ip(data, person, item, score)
```

Arguments

data	A data frame containing one row per observation.
person	Name of the person column.
item	Name of the nested item column.
score	Name of the numeric score column.

Value

An object of class "gstudy_gtheoryr".

Examples

```
nested_scores <- data.frame(
  person = c("P1", "P1", "P2", "P2", "P3", "P3"),
  item = c("P1_I1", "P1_I2", "P2_I1", "P2_I2", "P3_I1", "P3_I2"),
  score = c(8, 6, 5, 4, 9, 7)
)

gs_nested <- gstudy_nested_ip(
  nested_scores,
  person = "person",
  item = "item",
  score = "score"
)
gs_nested
```

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gstudy_pxi — *Estimate Variance Components for a Crossed Persons-by-Items Design*

Description

Estimates ANOVA mean squares and variance components for a fully crossed random-effects persons-by-items design.

Usage

```
gstudy_pxi(data, person, item, score)
```

Arguments

data	A data frame containing one row per person-item observation.
person	Name of the person column.
item	Name of the item column.
score	Name of the numeric score column.

Value

An object of class "gstudy_gtheoryr".

Examples

```
scores <- data.frame(
  person = rep(c("P1", "P2", "P3"), each = 3),
  item = rep(c("I1", "I2", "I3"), times = 3),
  score = c(8, 7, 9, 5, 4, 6, 7, 6, 8)
)

gs <- gstudy_pxi(scores, person = "person", item = "item", score = "score")
gs
```

Index