

# Package ‘IMTest’

April 7, 2017

**Title** Information Matrix Test for Generalized Partial Credit Models

**Version** 1.0.0

**Description** Implementation of the information matrix test for generalized partial credit models.

**Depends** R (>= 3.3.0), ltm

**Imports** MASS, lme4, reshape2

**License** GPL (>= 2)

**LazyData** true

**RoxygenNote** 6.0.1

**Suggests** knitr, rmarkdown

**VignetteBuilder** knitr

**NeedsCompilation** no

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**Repository** CRAN

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collapse_data	<i>Collapses data for a given collapsing function</i>
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**Description**

Collapses data for a given collapsing function

**Usage**

```
collapse_data(data, collapse, constraint)
```

**Arguments**

data	A dataset with J columns and n rows.
collapse	A list of length J indicating the scoring function to collapse from.
constraint	Constraint is either "rasch" or "gpcm" depending on which parameter constraints should be run.

**Value**

A list containing the collapsed data and a indicator vector for which parameters to test with the IMT. If no collapsing has occurred, the default indicator vector tests all parameters of the last item.

**Examples**

```
data(dataset)
collapse = split(rep(c(1:4), 10), rep(1:10, each = 4))
my_data = collapse_data(dataset, collapse, "rasch")
# See vignette("IMT-vignette") for more examples.
```

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dataset	<i>Synthetic dataset of 1000 responses to 10 items, each with four categories, generated from a Partial Credit Model.</i>
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**Description**

Synthetic dataset of 1000 responses to 10 items, each with four categories, generated from a Partial Credit Model.

**Usage**

```
dataset
```

**Format**

An object of class `data.frame` with 1000 rows and 10 columns.

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gh	<i>Table with GH points</i>
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**Description**

Table with GH points

**Usage**

gh

**Format**

An object of class `list` of length 101.

**Source**

ltn package

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gpcm_IMT	<i>Runs the GPCM model for use in the Information Matrix Test.</i>
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**Description**

Runs the GPCM model for use in the Information Matrix Test.

**Usage**

```
gpcm_IMT(data, constraint = c("gpcm", "1PL", "rasch"), IRT.param = TRUE,
  start.val = NULL, na.action = NULL, control = list())
```

**Arguments**

<code>data</code>	A dataset with J columns and n rows.
<code>constraint</code>	Constraint is either "1PL", "rasch" or "gpcm" depending on which parameter constraints should be run.
<code>IRT.param</code>	logical; if TRUE then the usual IRT parametrization is used.
<code>start.val</code>	If not Null, a list of starting values for the parameter estimates
<code>na.action</code>	the na.action to be used on the data
<code>control</code>	See gpcm function in ltn package for details.

**Value**

A GPCM object.

**Examples**

```
data(dataset)
model = gpcm_IMT(dataset, constraint = "rasch")
# See vignette("IMT-vignette") for more examples
```

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IMT	<i>Runs information matrix test for an information matrix test GPCM model.</i>
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**Description**

Runs information matrix test for an information matrix test GPCM model.

**Usage**

```
IMT(mod, constraint, R, ind_vec)
```

**Arguments**

mod	An IMT GPCM model.
constraint	Constraint is either "rasch" or "gpcm".
R	number of iterations for simulation of the variance-covariance matrix.
ind_vec	Vector of 0's and 1's for item-level parameters to be tested in the information matrix test.

**Value**

A list containing the information matrix test statistic and the associated degrees of freedom.

**Examples**

```
data(dataset)
collapse = split(rep(c(1:4), 10), rep(1:10, each = 4))
my_data = collapse_data(dataset, collapse, "rasch")
model = gpcm_IMT(my_data$data, constraint = "rasch")

test_fit = IMT(model, "rasch", R = 5000, my_data$ind)
#This line of code takes longer than 10 seconds to run
pvalue = pchisq(test_fit$Tstat, test_fit$df, lower.tail = FALSE)

# See vignette("IMT-vignette") for more examples
```

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