Package ‘Lambda4’

February 19, 2015

Type Package
Title Collection of Internal Consistency Reliability Coefficients.
Version 3.0
Date 2013-07-30
Author Tyler Hunt <tyler@psychoanalytix.com>
Maintainer Tyler Hunt <tyler@psychoanalytix.com>
Description Currently the package includes 14 methods for calculating internal consistency reliability but is still growing. The package allows users access to whichever reliability estimator is deemed most appropriate for their situation.
LazyData true
License GPL-2
Suggests mice, GPArotation, testthat
Collate 'angoff.R' 'bin.combs.R' 'cov.lambda4.R' 'impute.cov.R'
  'kristof.R' 'lambda1.R' 'lambda2.R' 'lambda3.R' 'lambda5.R'
  'lambda6.R' 'omega.tot.R' 'print.Lambda4.pkg.R'
  'quant.lambda4.R' 'raju.R' 'user.lambda4.R' 'guttman.R'
NeedsCompilation no
Repository CRAN
Date/Publication 2013-07-30 21:12:51

R topics documented:

angoff .................................................. 2
bin.combs ............................................. 3
cong1f ............................................... 4
cong3f ............................................... 5
cong5f ............................................... 6
cov.lambda4 .......................................... 7
Feldt1989 ............................................. 8
**Compute Angoff Coefficient**

Angoff’s coefficient is most appropriately used for estimating reliability in tests that can be split into two parts with unequal lengths. The calculation corrects for the inequality of length in the splits. Angoff’s coefficient is also believed to handle congeneric test structures relatively well.

**Usage**

\[
\text{angoff}(x, \text{split.method} = \text{"even.odd"}, \\
\text{missing} = \text{"complete"}, \text{standardize} = \text{FALSE})
\]

**Arguments**

- **x**: Can be either a data matrix or a covariance matrix.
- **split.method**: Specify method for splitting items?
- **missing**: How to handle missing values.
- **standardize**: When TRUE Results are standardized by using the correlation matrix instead of the covariance matrix for computation.
**Value**

- **angoff**
  The estimate of reliability.
- **Split**
  The split half key used to calculate angoff’s coefficient.

**Author(s)**

Tyler Hunt <tyler@psychoanalytix.com>

**References**


**Examples**

```r
angoff(Rosenberg, split.method="even.odd", missing="complete", standardize=FALSE)
```

---

**bin.combs**

*Generate Unique Binary Combinations*

**Description**

Provides all of the unique binary combinations for the cov.lambda4 function. It should be noted that this function does not provide all combinations but only ones that are unique for the cov.lambda4 function. That is a vector coded c(0,1,0,1) is equivalent to a vector c(1,0,1,0) and only one of them is generated.

**Usage**

```r
bin.combs(p)
```

**Arguments**

- **p**
  The number of items in the test.

**Value**

Function returns a matrix of binary combinations coded as either -1 or 1.
Author(s)

Tyler Hunt <tyler@psychoanalytix.com>

Examples

bin.combs(4)

---

cong1f

One-Factor Congeneric Covariance Matrix

Description

This Covariance matrix was used as the population model for one set of simulations. It was used to represent a congeneric data structure in which the factor loadings are set at .5, .6, .7, .8, .5, .6, .7, and .8. The error variances were set at .6^2, .7^2, .8^2, .9^2, .6^2, .7^2, .8^2, and .9^2.

Usage

data(cong1f)

Format

A covariance matrix of 8 theoretical items.

Examples

```R
###---Loadings
fx<-t(matrix(c(.5, .6, .7, .8, .5, .6, .7, .8), nrow=1))

###---Error Variances
err<-diag(c(.6^2,.7^2,.8^2,.9^2, .6^2,.7^2,.8^2,.9^2))

###---matrix of factor covariances
phi<-matrix(1, nrow=1)

###---Reliability Calculation---
#t1<-matrix(c(rep(1,8)), nrow=1)
t1t<-matrix(c(rep(1,8)), ncol=1)

(fx%*%phi%*%t(fx)+err)
```
Three-Factor Congeneric Covariance Matrix

Description

This covariance matrix was used as the population model for one set of simulations. It was used to represent a congeneric data structure in which the factor loadings are set at .5, .6, .7, 8, .5, .6, .7, and .8. The error variances were set at .6^2, .7^2, .8^2, .9^2, .6^2, .7^2, .8^2, and .9^2. The correlations between the latent variables was fixed to .3.

Usage

data(cong3f)

Format

A covariance matrix of 12 theoretical items.

Examples

### Loadings
fx<-t(matrix(c(.5,0,0,
.6,0,0,
.7,0,0,
.8,0,0,
0,.5,0,
0,.6,0,
0,.7,0,
0,.8,0,
0,0,.5,
0,0,.6,
0,0,.7,
0,0,.8), nrow=3))

### Error Variances
err<-diag(matrix(c(.6^2,.7^2,.8^2,.9^2,
.6^2,.7^2,.8^2,.9^2,
.6^2,.7^2,.8^2,.9^2)))

### 3x3 matrix of factor covariances
phi<-matrix(c(rep(.3, 9)), nrow=3)
diag(phi)<-1

### Reliability Calculation

t1<-matrix(c(rep(1,12)), nrow=1)
t1t<-matrix(c(rep(1,12)), ncol=1)

(fx%*%phi%*%t(fx)+err)
Five-Factor Congeneric Covariance Matrix

Description

This Covariance matrix was used as the population model for one set of simulations. It was used to represent a congeneric data structure in which the factor loadings are set at .5, .6, .7, .8, .5, .6, .7, and .8. The error variances were set at .6^2, .7^2, .8^2, .9^2, .6^2, .7^2, .8^2, and .9^2. The correlations between the latent variables was fixed to .3.

Usage

data(cong5f)

Format

A covariance matrix of 20 theoretical items.

Examples

```r
fx<-t(matrix(c(0.5,0,0,0,0,0.6,0,0,0,0,0,0.7,0,0,0,0,0,0,0.8,0,0,0,0,0,0.5,0,0,0,0,0,0.6,0,0,0,0,0,0.7,0,0,0,0,0,0.8,0,0,0,0,0,0.5,0,0,0,0,0,0.6,0,0,0,0,0,0.7,0,0,0,0,0,0.8,0,0,0,0,0,0.5,0,0,0,0,0,0.6,0,0,0,0,0,0.7,0,0,0,0,0,0.8,0,0,0,0,0,0.5,0,0,0,0,0,0.6,0,0,0,0,0,0.7,0,0,0,0,0,0.8,0,0,0,0,0,0.5,0,0,0,0,0,0.6,0,0,0,0,0,0.7,0,0,0,0,0,0.8,0), nrow=5))
```

####---Error Variances

```r
err<-diag(c(0.6^2,0.7^2,0.8^2,0.9^2,0.6^2,0.7^2,0.8^2,0.9^2,0.6^2,0.7^2,0.8^2,0.9^2,0.6^2,0.7^2,0.8^2,0.9^2))
```

####---5x5 matrix of factor covariances
cov.lambda4

phi<-matrix(c(rep(.3, 25)), nrow=5)
diag(phi)<-1

### Reliability Calculation###
t1<-matrix(c(rep(1,20)), nrow=1)
tlt<-matrix(c(rep(1,20)), ncol=1)
(fx%*%phi%*%t(fx)+err)

Compute Covariance Maximized Lambda4

description

This code estimates maximized lambda4, a split-half reliability estimate. The function splits the
halves by specifying a two column list of paired inter-item covariances in descending order. It then
calculates Guttman's lambda4 on every possible split-half while preserving the inter-item pairings.
The function then returns a list of the Lambda4s and then takes the minimum, maximum, median,
and mean of the list. This calculation is most appropriately applied to tests with multiple factors.

usage

cov.lambda4(x, method = "Hunt", missing = "complete",
show.lambda4s = FALSE, show.splits = FALSE,
standardize = FALSE)

arguments

x Can be either a data matrix or a covariance matrix.
method Can specify either "Hunt" or "Osburn".
missing How to handle missing values.
show.lambda4s If TRUE then the estimates for each split are included in the output.
show.splits If TRUE then a binary matrix is exported that describes the ways the items were
split.
standardize When TRUE results are standardized by using the correlation matrix instead of
the covariance matrix for computation.

value

estimates The mean, median, max, and min of the split-half reliabilities.
lambda4s A vector of maximized split-half reliabilities.
method The method chosen. Either "Hunt" or "Osburn".
Analysis.Details Returns the number of variables and the number of split-half reliabilities.
Splits The binary indicators of the splits for the min, max, and median split-half reliabil-
ity.
show.splits Logical argument selected to show the splits.
show.lambda4s Logical argument selected to show the split-half reliabilities.
Author(s)

Tyler Hunt <tyler@psychoanalytix.com>

Examples

cov.lambda4(Rosenberg, method="Hunt")
cov.lambda4(Rosenberg, method="Osburn")

Feldt1989  

Feldt's Numerical Example With 4 Items

Description

This covariance matrix was used as a numerical example in Feldt and Brennans' chapter in Educational Measurement titled Reliability.

Usage

data(Feldt1989)

Format

A covariance matrix of 4 items.

guttman  

Guttman's 6 Lambda Coefficients

Description

Calculates all 6 of Guttman's lambda coefficients.

Usage

guttman(x, missing = "complete", standardize = FALSE)

Arguments

x  Can be either a data matrix or a covariance matrix
missing  How to handle missing values.
standardize  When TRUE Results are standardized by using the correlation matrix instead of the covariance matrix for computation.
Value

Lambda1  Guttman’s Lambda1 estimate of reliability.
Lambda2  Guttman’s Lambda2 estimate of reliability.
Lambda3  Guttman’s Lambda3 estimate of reliability. Also known as Cronbach’s alpha or coefficient alpha.
Lambda4  Guttman’s maximimal Lambda4 estimate of reliability.
Lambda5  Guttman’s Lambda5 estimate of reliability.
Lambda6  Guttman’s Lambda6 estimate of reliability.

Note

The estimate for Lambda4 is maximized.

Author(s)

Tyler Hunt <tyler@psychoanalytix.com>

References


Examples

guttman(Rosenberg)

__impute.cov__  __Compute Covariance Matrix__

**Description**

Implements various missing data techniques and generates a covariance matrix.

**Usage**

`impute.cov(x, missing = c("complete", "pairwise", "mi"))`

**Arguments**

- `x`  A data matrix
- `missing`  how to handle missing values.

**Author(s)**

Tyler Hunt <tyler@psychoanalytix.com>
kristof

*Compute Kristof Coefficient*

**Description**

A reliability coefficient used for tests that are easily split into three parts.

**Usage**

```
kristof(x, split.method = "triplet",
         missing = "complete", standardize = FALSE)
```

**Arguments**

- `x` Can be either a data matrix or a covariance matrix
- `split.method` Specify method for splitting items?
- `missing` How to handle missing values.
- `standardize` When TRUE Results are standardized by using the correlation matrix instead of the covariance matrix for computation.

**Value**

- `kristof` The Kristof estimate of reliability.
- `split` The split used to obtain the reliability estimate.

**Author(s)**

Tyler Hunt <tyler@psychoanalytix.com>

**References**


**Examples**

```
kristof(Rosenberg, split.method="triplet")
```
Compute Guttman's Lambda 1 Coefficient

Description
Compute Guttman's Lambda 1 Coefficient

Usage
lambda1(x, missing = "complete", standardize = FALSE)

Arguments
x an object that you can compute the covariance of
missing how to handle missing values.
standardize Results are standardized by using the correlation matrix instead of the covariance matrix for computation.

Author(s)
Tyler Hunt <tyler@psychoanalytix.com>

References

Examples
lambda1(Rosenberg)

Compute Guttman's Lambda 2 Coefficient

Description
Compute Guttman’s Lambda 2 Coefficient

Usage
lambda2(x, missing = "complete", standardize = FALSE)

Arguments
x Can be either a data matrix or a covariance matrix
missing how to handle missing values.
standardize Results are standardized by using the correlation matrix instead of the covariance matrix for computation.
Author(s)

Tyler Hunt <tyler@psychoanalytix.com>

References


Examples

\[\text{lambda2(Rosenberg)}\]

\[\text{lambda3} \]

*Compute Guttman's Lambda 3 Coefficient (Coefficient Alpha)*

Description

Often recognized as Cronbach's alpha, Guttman's Lambda 3 can be used to estimate reliability when the data can be split in parallel forms.

Usage

\[\text{lambda3}(x, \text{item.stats.max} = 12, \text{missing} = "\text{complete}"\)

Arguments

- **x**: Can be either a data matrix or a covariance matrix
- **item.stats.max**: Items statistics shown if the number of items are less than this value.
- **missing**: How to handle missing values.

Value

- **lambda3**: The unstandardized and standardized lambda3 estimate.
- **item.stats**: If the input data was a covariance matrix then this is a table of reliability estimates if an item was dropped. If the input data is a data frame then the mean, standard deviation, and number of observations are also included.
- **items**: The number of items.
- **item.stats.max**: The maximum number of item to display the item.stats table (user specified).

Author(s)

Tyler Hunt <tyler@psychoanalytix.com>

References

**Examples**

\lambda_3(Rosenberg)

---

**Lambda4**  
*Collection of Internal Consistency Reliability Coefficients.*

---

**Description**

Currently the package includes 14 methods for calculating internal consistency reliability but is still growing. The package allows users access to whichever reliability estimator is deemed most appropriate for their situation.

**Functions**

- `angoff`: Compute Angoff Coefficient
- `bin.combs`: Generate Unique Binary Combinations
- `cov.lambda4`: Compute Covariance Maximized Lambda4
- `impute.cov`: Compute Covariance Matrix
- `kristof`: Compute Kristof Coefficient
- `lambda1`: Compute Guttman’s Lambda 1 Coefficient
- `lambda2`: Compute Guttman’s Lambda 2 Coefficient
- `lambda3`: Compute Guttman’s Lambda 3 Coefficient (Coefficient Alpha)
- `lambda5`: Compute Guttman’s Lambda 5 Coefficient
- `lambda6`: Compute Guttman’s Lambda 6 Coefficient
- `lambdas`: Compute Guttman’s Lambda Coefficients
- `omega.tot`: Compute McDonald’s Omega Total
- `quant.lambda4`: Compute Quantile Lambda 4
- `raju`: Compute Raju’s Coefficient
- `user.lambda4`: Compute User Specified Lambda 4 (Split-Half)

**Author(s)**

Tyler Hunt <tyler@psychoanalytix.com>

**References**


---

**lambda5**

*Compute Guttman’s Lambda 5 Coefficient*

### Description

Compute Guttman’s Lambda 5 Coefficient

### Usage

```r
lambda5(x, missing = "complete", standardize = FALSE)
```

### Arguments

- **x**: Can be either a data matrix or a covariance matrix.
- **missing**: how to handle missing values.
- **standardize**: Results are standardized by using the correlation matrix instead of the covariance matrix for computation.

### Author(s)

Tyler Hunt <tyler@psychoanalytix.com>

### References


### Examples

```r
lambda5(Rosenberg)
```
lambda6

Compute Guttman's Lambda 6 Coefficient

Description
Compute Guttman’s Lambda 6 Coefficient

Usage
lambda6(x, missing = "complete", standardize = FALSE)

Arguments
x
Can be either a data matrix or a covariance matrix.
missing
how to handle missing values.
standardize
Results are standardized by using the correlation matrix instead of the covariance matrix for computation.

Author(s)
Tyler Hunt <tyler@psychoanalytix.com> lambda6(Rosenberg)

References

omega.tot

Compute McDonald’s Omega Total

Description
McDonald proposed Omega Total as a method for estimating reliability for a test with multiple factors.

Usage
omega.tot(x, factors = 1, missing = "complete")

Arguments
x
Can be either a data matrix or a covariance matrix
missing
how to handle missing values. mi.
factors
The number of latent factors.
Value
omega.tot  Omega total reliability estimate.

Author(s)
Tyler Hunt <tyler@psychoanalytix.com>

References

Examples
omega.tot(Rosenberg, factors=1)

---

par1f  One Factor Parallel Covariance Matrix

Description
This Covariance matrix was used as the population model for one set of simulations. It was used to represent a parallel data structure in which all factor loadings and error variances are set at .6.

Usage
data(par1f)

Format
A covariance matrix of 8 theoretical items.

Examples

#### Loadings
fx<-t(matrix(c(.6, .6, .6, .6, .6, .6, .6, .6, .6), nrow=1))

#### Error Variances
err<-diag(c(.6^2,.6^2,.6^2,.6^2, .6^2,.6^2,.6^2,.6^2))

#### matrix of factor covariances
par3f

```
phi<-matrix(1, nrow=1)

#--- Reliability Calculation ---#

t1<-matrix(c(rep(1,8)), nrow=1)
t1t<-matrix(c(rep(1,8)), ncol=1)

(fx%*%phi%*%t(fx)+err)
```

---

### Three-Factor Parallel Covariance Matrix

**Description**

This Covariance matrix was used as the population model for one set of simulations. It was used to represent a parallel data structure in which all factor loadings and error variances are set at .6 and the latent variables are correlated at .3.

**Usage**

```r
data(par3f)
```

**Format**

A covariance matrix of 12 theoretical items.

**Examples**

```r
### Loadings
fx<-t(matrix(c(.
  .6,0,0,
  .6,0,0,
  .6,0,0,
  .6,0,0,
  0,.6,0,
  0,.6,0,
  0,.6,0,
  0,.6,0,
  0,.6,0,
  0,.6,0,
  0,.6,0,
  0,.6,0), nrow=3))

### Error Variances
err<-diag(c(.
  .6^2,.6^2,.6^2,.6^2,
  .6^2,.6^2,.6^2,.6^2,
  .6^2,.6^2,.6^2,.6^2))

### 3x3 matrix of factor covariances
phi<-matrix(c(rep(.3, 9)), nrow=3)
diag(phi)<-1
```
### Reliability Calculation

t1<-matrix(c(rep(1,12)), nrow=1)
t1t<-matrix(c(rep(1,12)), ncol=1)

(fx%*%phi%*%t(fx)+err)

---

**par5f**  

*Five-Factor Parallel Covariance Matrix*

---

**Description**

This Covariance matrix was used as the population model for one set of simulations. It was used to represent a parallel data structure in which all factor loadings and error variances are set at .6 and the latent variables are correlated at .3.

**Usage**

data(par5f)

**Format**

A covariance matrix of 20 theoretical items.

**Examples**

#### Loadings

fx<-t(matrix(c(  
  .6,0,0,0,0,  
  .6,0,0,0,0,  
  .6,0,0,0,0,  
  .6,0,0,0,0,  
  0,.6,0,0,0,  
  0,.6,0,0,0,  
  0,.6,0,0,0,  
  0,.6,0,0,0,  
  0,0,.6,0,0,  
  0,0,.6,0,0,  
  0,0,.6,0,0,  
  0,0,.6,0,0,  
  0,0,.6,0,0,  
  0,0,.6,0,0,  
  0,0,.6,0,0,  
  0,0,.6,0,0,  
  0,0,.6,0,0,  
  0,0,.6,0,0,  
  0,0,.6,0,0,  
  0,0,.6,0,0,  
  0,0,0,.6,0,  
  0,0,0,.6,0,  
  0,0,0,.6,0,  
  0,0,0,.6,0), nrow=5))

#### Error Variances
quant.lambda4

---

Quantile lambda4 is a statistic that can be used in most measurement situations. In particular this function generates a vector t of length equal to the number of items. Each value in the vector consists of either a +1 or -1 (randomly generated). Next, in a random order each value in the t-vector is switched. The value kept (+1 or -1) is the value that resulted in the highest reliability estimate. This procedure is repeated by default 1000 times but can also be user specified. The user can then specify the quantile of this vector but it defaults to .5.

Usage

quant.lambda4(x, starts = 1000, quantiles = 0.5, missing = "complete", show.lambda4s = FALSE, standardize = FALSE)

Arguments

x Can be either a data matrix or a covariance matrix
starts How many split-half reliability estimates used
quantiles The quantiles of the generated splits. It defaults to .5 because it makes the most sense at this time. (The simulation manuscript is under review).
missing How to handle missing values.
show.lambda4s If TRUE then Shows the vector of lambda4s if FALSE then the vector is hidden
standardize Results are standardized by using the correlation matrix instead of the covariance matrix for computation.
Value

lambda4.quantile
The user specified quantile value of the vector of maximized split-reliability

lambda4.optimal
Maximum split-half reliability (Maximized Lambda4

14.vect A vector of lambda4 (split-half reliability) calculations

Author(s)

Tyler Hunt <tyler@psychoanalytix.com>

References


Examples

quant.lambda4(Rosenberg, starts=1000, quantile=c(.05,.5,.95))

raju

Compute Raju Coefficient

Description

Compute Raju Coefficient

Usage

raju(x, split.method = "even.odd", missing = "complete", standardize = FALSE)
Rosenberg

Arguments

- **x** Can be either a data matrix or a covariance matrix
- **split.method** Specify method for splitting items.
- **missing** How to handle missing values.
- **standardize** When TRUE Results are standardized by using the correlation matrix instead of the covariance matrix for computation.

Author(s)

Tyler Hunt <tyler@psychoanalytix.com>

Examples

```r
raju(Rosenberg, split.method="even.odd")
```

---

Rosenberg

**Rosenberg Self-Esteem**

Description

The data set was collected in Southern Utah in the Fall of 2010. The investigation sought responses from high school and college students. It should be noted that the reverse coded items have been flipped.

Usage

```r
data(Rosenberg)
```

Format

A data frame with 837 observations on the following 10 variables.

- **SEFailure** All in all, I am inclined to feel that I am a failure.
- **SENoGood** At times I think I am no good at all.
- **SEable** I am able to do things as well as most other people.
- **SEUseless** I certainly feel useless at times.
- **SENoProud** I feel I do not have much to be proud of.
- **SGoodQualities** I feel that I have a number of good qualities.
- **SEWorth** I feel that I am a person of worth, at least on an equal plane with others.
- **SEPositive** I take a positive attitude toward myself.
- **SERespect** I wish I could have more respect for myself.
- **SESatisfied** On the whole, I am satisfied with myself.

Examples

```r
data(Rosenberg)
```
**tau1f**  

*One-Factor Tau-Equivalent Covariance Matrix*

---

**Description**

This covariance matrix was used as the population model for one set of simulations. It was used to represent a tau equivalent data structure in which the factor loadings are set at .6. The error variances were set at .6^2, .7^2, .8^2, .9^2, and .6^2, .7^2, .8^2, and .9^2.

**Usage**

`data(tau1f)`

**Format**

A covariance matrix of 8 theoretical items.

**Examples**

```r
### Loadings
fx<-t(matrix(c(.6,.6,.6,.6,.6,.6,.6,.6), nrow=QI))

### Error Variances
err<-diag(c(.6^2,.7^2,.8^2,.9^2,.6^2,.7^2,.8^2,.9^2))

### Matrix of factor covariances
phi<-matrix(QI, nrow=QI)

### Reliability Calculation

(t1<-matrix(c(rep(1,8)), nrow=1))
tlt<-matrix(c(rep(1,8)), ncol=1)

(fx%*%phi%*%t(fx)+err)
```
Description

This covariance matrix was used as the population model for one set of simulations. It was used to represent a tau equivalent data structure in which the factor loadings are set at .6. The error variances were set at .6^2, .7^2, .8^2, .9^2, .6^2, .7^2, .8^2, and .9^2. The correlations between the latent variables was fixed to .3.

Usage

data(tau3f)

Format

A covariance matrix of 12 theoretical items.

Examples

#### Loadings
fx<-t(matrix(c(
  .6,0,0,        
  .6,0,0,        
  .6,0,0,        
  .6,0,0,        
  .6,0,0,        
  0,0,0,0,0,0,0,  
  0,0,0,0,0,0,0,  
  0,0,0,0,0,0,0,  
  0,0,0,0,0,0,0,  
  0,0,0,0,0,0,0,  
  0,0,0,0,0,0,0,  
  0,0,0,0,0,0,0,  
  0,0,0,0,0,0,0,  
  0,0,0,0,0,0,0,  
  0,0,0,0,0,0,0), nrow=3))

#### Error Variances
err<-diag(c(.6^2,.7^2,.8^2,.9^2,  
             .6^2,.7^2,.8^2,.9^2,  
             .6^2,.7^2,.8^2,.9^2))

#### 3x3 matrix of factor covariances
phi<-matrix(c(rep(.3,9)), nrow=3)
diag(phi)<-1

#### Reliability Calculation

t1<-matrix(c(rep(1,12)), nrow=1)
tl<-matrix(c(rep(1,12)), ncol=1)
(fx%*%phi%*%t(fx)+err)
Description
This covariance matrix was used as the population model for one set of simulations. It was used to represent a tau equivalent data structure in which the factor loadings are set at .6. The error variances were set at .6^2, .7^2, .8^2, .9^2, .6^2, .7^2, .8^2, .9^2, .6^2, .7^2, .8^2, and .9^2. The correlations between the latent variables was fixed to .3.

Usage

data(tau5f)

Format
A covariance matrix of 20 theoretical items.

Examples

```r
###---Loadings
fx<-t(matrix(c(.6,0,0,0,0, .6,0,0,0,0, .6,0,0,0,0, .6,0,0,0,0, 0,.6,0,0,0, 0,.6,0,0,0, 0,.6,0,0,0, 0,.6,0,0,0, 0,.6,0,0,0, 0,.6,0,0,0, 0,.6,0,0,0, 0,.6,0,0,0, 0,.6,0,0,0, 0,.6,0,0,0, 0,.6,0,0,0, 0,.6,0,0,0, 0,.6,0,0,0, 0,.6,0,0,0, 0,.6,0,0,0, 0,.6,0,0,0, 0,.6,0,0,0, nrow=5))

###---Error Variances
err<-diag(c(.6^2,.7^2,.8^2,.9^2, .6^2,.7^2,.8^2,.9^2, .6^2,.7^2,.8^2,.9^2, .6^2,.7^2,.8^2,.9^2, .6^2,.7^2,.8^2,.9^2))
```
### 5x5 matrix of factor covariances

```r
phi <- matrix(c(rep(.3, 25)), nrow=5)
```

```r
diag(phi) <- 1
```

### Reliability Calculation

```r
t1 <- matrix(c(rep(1, 20)), nrow=1)
t1t <- matrix(c(rep(1, 20)), ncol=1)
(fx %*% phi %*% t(fx) + err)
```

---

**De Leeuw (1983) Political Survey Items**

**Description**

Six political survey items, \( N = 119 \), and unidimensional.

**Usage**

```r
data(TenBerge2004)
```

**Details**

This is a covariance matrix that comes from De Leeuw (1983) and represents six political survey items. These items are based on \( N = 119 \) members of parliament and are supposed to measure the same trait and be unidimensional.

**Source**


**References**


**Examples**

```r
data(TenBerge2004)
```
user.lambda4  \hspace{1cm} Compute User Specified Lambda 4 (Split-Half)

**Description**

Compute User Specified Lambda 4 (Split-Half)

**Usage**

```r
user.lambda4(x, split.method = "even.odd", item.stats = FALSE, missing = "complete")
```

**Arguments**

- `x` Can be either a data frame or a covariance matrix.
- `split.method` Specify method for splitting items.
- `item.stats` If TRUE then item statistics are provided in the output.
- `missing` How to handle missing values.

**Author(s)**

Tyler Hunt <tyler@psychoanalytix.com>

**References**


**Examples**

```r
user.lambda4(Rosenberg)
user.lambda4(Rosenberg, c(0, 1, 1, 0, 1, 1, 0, 1, 0, 0))
```

---

**WAIS1955  \hspace{1cm} Wechsler Adult Intelligence Scale (1955)**

**Description**

Data comes from Warner, Meeker, and Eels (1960) and is a multidimensional scale of composite scores of social class.

**Usage**

```r
data(WAIS1955)
```
Details

This is a covariance matrix of the 11 subtests of the WAIS based on N = 300. The subtests include: comprehension, arithmetic, similarities, digit span, vocabulary, digit symbol, picture completion, block design, picture arrangement, and object assembly. These data have been used by Bentler (1972) to show the stark difference between alpha and the glb.

Source


References


Examples

data(WAIS1955)

<table>
<thead>
<tr>
<th>Warner1960</th>
<th>Warner 1960 Social Class Data</th>
</tr>
</thead>
</table>

Description

Data comes from Warner, Meeker, and Eels (1960) and is a multidimensional scale of composite scores of social class.

Usage

data(Warner1960)

Format

The format is: num [1:6, 1:6] 1 0.87 0.76 0.71 0.7 0.77 0.87 1 0.82 0.81 ...

Details

The components were averaged and then the averages were used for the covariance matrix. The factors are: occupation, amount of income, source of income, house type, dwelling area, and education. These data have been used by Bentler (1972) to show the stark difference between alpha and the glb.

Source

References


Examples

data(Warner1960)
Index

+Topic datasets
  cong1f, 4
  cong3f, 5
  cong5f, 6
  Feldt1989, 8
  par1f, 16
  par3f, 17
  par5f, 18
  Rosenberg, 21
  tau1f, 22
  tau3f, 23
  tau5f, 24
  TenBerge2004, 25
  WAIS1955, 26
  Warner1960, 27

angoff, 2
bin.combs, 3
cong1f, 4
cong3f, 5
cong5f, 6
cov.lambda4, 7
Feldt1989, 8
guttman, 8
impute.cov, 9
kristof, 10
lambda1, 11
lambda2, 11
lambda3, 12
Lambda4, 13
lambda5, 14
lambda6, 15
omega.tot, 15
par1f, 16
par3f, 17
par5f, 18
quant.lambda4, 19
raju, 20
Rosenberg, 21
tau1f, 22
tau3f, 23
tau5f, 24
TenBerge2004, 25
user.lambda4, 26
WAIS1955, 26
Warner1960, 27