

Package ‘RTaxometrics’

May 30, 2023

Type Package

Title Taxometric Analysis

Version 3.2.1

Date 2023-5-29

Author John Ruscio <ruscio@tcnj.edu> and Shirley Wang <shirleywang@g.harvard.edu>

Maintainer John Ruscio <ruscio@tcnj.edu>

Description We provide functions to perform taxometric analyses. This package contains 46 functions, but only 5 should be called directly by users. CheckData() should be run prior to any taxometric analysis to ensure that the data are appropriate for taxometric analysis. RunTaxometrics() performs taxometric analyses for a sample of data. RunCCFIProfile() performs a series of taxometric analyses to generate a CCFI profile. CreateData() generates a sample of categorical or dimensional data. ClassifyCases() assigns cases to groups using the base-rate classification method.

License MIT + file LICENSE

RoxygenNote 7.1.0

NeedsCompilation no

Repository CRAN

Date/Publication 2023-05-30 12:00:02 UTC

R topics documented:

AddVariance	2
AssignMAMBAC	3
AssignMAXEIG	4
CalculateBaseRates	4
CalculateCCFI	5
CalculateCCFIs	6
CalculateCCFIsProfile	6
CalculateFitDensities	7
CalculateKurtosis	8
CalculateLModeCCFI	8
CalculateMAMBAC	9

CalculateMAXEIG	10
CalculateMAXSLOPE	10
CalculateProfileOutput	11
CalculateSkew	12
CalculateValidity	12
CheckClassification	13
CheckData	14
CheckParameters	15
ClassifyCases	15
CreateData	16
CreateSample	17
CreateVariable	18
DisplayPanels	19
DisplayProfiles	20
EstimateLMode	20
EstimateMAMBAC	21
EstimateMAXEIG	22
EstimateMAXSLOPE	22
GenerateData	23
GetSpecifications	24
PlotPanel	24
ProcessProfile	25
RemoveMissingData	26
RunCCFIPprofile	26
RunFactorAnalysis	28
RunLMode	29
RunMAMBAC	30
RunMAXEIG	30
RunMAXSLOPE	31
RunProcedures	32
RunProceduresComp	33
RunTaxometrics	34
SummarizeDist	35

Index	37
--------------	-----------

AddVariance	<i>Adds variance</i>
-------------	----------------------

Description

This function adds variance if necessary

Usage

AddVariance(x, k, parameters)

Arguments

x	The supplied data matrix.
k	The number of variables.
parameters	The data and program parameters

Details

Called by higher-order functions; users do not need to call this function directly.

Value

Data with necessary variance added

Author(s)

John Ruscio <ruscio@tcnj.edu> and Shirley Wang <shirleywang@g.harvard.edu> Maintainer: John Ruscio <ruscio@tcnj.edu>

AssignMAMBAC

Assigns variables to input/output for MAMBAC procedure

Description

This function assigns variables to input/output configurations for MAMBAC analysis.

Usage

```
AssignMAMBAC(parameters)
```

Arguments

parameters	The data and program parameters
------------	---------------------------------

Details

Called by higher-order functions; users do not need to call this function directly.

Value

Input/output variables per curve

Author(s)

John Ruscio <ruscio@tcnj.edu> and Shirley Wang <shirleywang@g.harvard.edu> Maintainer: John Ruscio <ruscio@tcnj.edu>

AssignMAXEIG	<i>Assigns variables to input/output for MAXEIG procedure</i>
--------------	---

Description

This function assigns variables to input/output configurations for MAXEIG analysis.

Usage

```
AssignMAXEIG(parameters)
```

Arguments

parameters	The data and program parameters
------------	---------------------------------

Details

Called by higher-order functions; users do not need to call this function directly.

Value

Input/output variables per curve

Author(s)

John Ruscio <ruscio@tcnj.edu> and Shirley Wang <shirleywang@g.harvard.edu> Maintainer: John Ruscio <ruscio@tcnj.edu>

CalculateBaseRates	<i>Calculates and returns base rate estimates for taxometric analysis</i>
--------------------	---

Description

This function calculates and reports base rate estimates for taxometric analysis.

Usage

```
CalculateBaseRates(x.results, parameters)
```

Arguments

x.results	Empirical data results
parameters	The data and program parameters

Details

Called by higher-order functions; users do not need to call this function directly.

Value

This program returns nothing, and provides text output only.

Author(s)

John Ruscio <ruscio@tcnj.edu> and Shirley Wang <shirleywang@g.harvard.edu> Maintainer: John Ruscio <ruscio@tcnj.edu>

CalculateCCFI	<i>Calculates CCFIs</i>
---------------	-------------------------

Description

This function calculates CCFIs for a MAMBAC, MAXEIG, or MAXSLOPE curve

Usage

```
CalculateCCFI(curve, curve.dim, curve.cat)
```

Arguments

curve	Empirical data curve
curve.dim	Average curve for dimensional comparison data
curve.cat	Average curve for categorical comparison data

Details

Called by higher-order functions; users do not need to call this function directly.

Value

CCFI value

Author(s)

John Ruscio <ruscio@tcnj.edu> and Shirley Wang <shirleywang@g.harvard.edu> Maintainer: John Ruscio <ruscio@tcnj.edu>

CalculateCCFIs *Calculates CCFIs for profiles*

Description

This function calculates CCFI results for CCFI profiles

Usage

```
CalculateCCFIs(x.results, x.dim.results, x.cat.results, parameters)
```

Arguments

x.results	Empirical data results
x.dim.results	Dimensional comparison data results
x.cat.results	Categorical comparison data results
parameters	The data and program parameters

Details

Called by higher-order functions; users do not need to call this function directly.

Value

CCFI values

Author(s)

John Ruscio <ruscio@tcnj.edu> and Shirley Wang <shirleywang@g.harvard.edu> Maintainer: John Ruscio <ruscio@tcnj.edu>

CalculateCCFIsProfile *Calculates CCFIs for profiles*

Description

This function calculates CCFI results for CCFI profiles

Usage

```
CalculateCCFIsProfile(x.results, x.dim.results, x.cat.results, parameters)
```

Arguments

x.results	Empirical data results
x.dim.results	Dimensional comparison data results
x.cat.results	Categorical comparison data results
parameters	The data and program parameters

Details

Called by higher-order functions; users do not need to call this function directly.

Value

CCFI values

Author(s)

John Ruscio <ruscio@tcnj.edu> and Shirley Wang <shirleywang@g.harvard.edu> Maintainer: John Ruscio <ruscio@tcnj.edu>

CalculateFitDensities *Calculates fit*

Description

This function calculates fit for L-Mode curves

Usage

```
CalculateFitDensities(shift, data)
```

Arguments

shift	Horizontal shift
data	Curves for empirical and comparison data

Details

Called by higher-order functions; users do not need to call this function directly.

Value

Fit value

Author(s)

John Ruscio <ruscio@tcnj.edu> and Shirley Wang <shirleywang@g.harvard.edu> Maintainer: John Ruscio <ruscio@tcnj.edu>

CalculateKurtosis *Calculates kurtosis*

Description

This function calculates the sample kurtosis of a distribution

Usage

CalculateKurtosis(x)

Arguments

x The data vector

Details

Called by higher-order functions; users do not need to call this function directly.

Value

The sample kurtosis of x

Author(s)

John Ruscio <ruscio@tcnj.edu> and Shirley Wang <shirleywang@g.harvard.edu> Maintainer: John Ruscio <ruscio@tcnj.edu>

CalculateLModeCCFI *Calculates L-Mode CCFI*

Description

This function calculates CCFI for an L-Mode curve

Usage

CalculateLModeCCFI(curve.x, curve.y, curve.dim.x, curve.dim.y, curve.cat.x, curve.cat.y)

Arguments

curve.x	Empirical data curve, x
curve.y	Empirical data curve, y
curve.dim.x	Average curve for dimensional comparison data, x
curve.dim.y	Average curve for dimensional comparison data, y
curve.cat.x	Average curve for categorical comparison data, x
curve.cat.y	Average curve for categorical comparison data, y

Details

Called by higher-order functions; users do not need to call this function directly.

Value

CCFI value

Author(s)

John Ruscio <ruscio@tcnj.edu> and Shirley Wang <shirleywang@g.harvard.edu> Maintainer: John Ruscio <ruscio@tcnj.edu>

CalculateMAMBAC	<i>Calculates MAMBAC curve</i>
-----------------	--------------------------------

Description

This function calculates one MAMBAC curve

Usage

```
CalculateMAMBAC(input, output, parameters)
```

Arguments

input	Input indicator
output	Output indicator
parameters	The data and program parameters

Details

Called by higher-order functions; users do not need to call this function directly.

Value

One MAMBAC curve

Author(s)

John Ruscio <ruscio@tcnj.edu> and Shirley Wang <shirleywang@g.harvard.edu> Maintainer: John Ruscio <ruscio@tcnj.edu>

CalculateMAXEIG *Calculates MAXEIG curve*

Description

This function calculates one MAXEIG curve

Usage

CalculateMAXEIG(input, outputs, parameters)

Arguments

input	Input indicator
outputs	Output indicators
parameters	The data and program parameters

Details

Called by higher-order functions; users do not need to call this function directly.

Value

List object with one MAXEIG curve:

curve.x	x values
curve.y	y values

Author(s)

John Ruscio <ruscio@tcnj.edu> and Shirley Wang <shirleywang@g.harvard.edu> Maintainer: John Ruscio <ruscio@tcnj.edu>

CalculateMAXSLOPE *Calculates MAXSLOPE curve*

Description

This function calculates one MAXSLOPE curve

Usage

CalculateMAXSLOPE(x, curve)

Arguments

x	The data matrix
curve	Curve number

Details

Called by higher-order functions; users do not need to call this function directly.

Value

List object with one MAXSLOPE curve:

curve.x	x values
curve.y	y values

Author(s)

John Ruscio <ruscio@tcnj.edu> and Shirley Wang <shirleywang@g.harvard.edu> Maintainer: John Ruscio <ruscio@tcnj.edu>

CalculateProfileOutput

Provides aggregated CCFIs and base rate estimates for CCFI profile

Description

This function provides aggregated CCFIs and base rate estimates for CCFI profile

Usage

```
CalculateProfileOutput(CCFIs, parameters)
```

Arguments

CCFIs	CCFI values across base rates and procedures
parameters	The data and program parameters

Details

Called by higher-order functions; users do not need to call this function directly.

Value

This function returns aggregated CCFI values.

Author(s)

John Ruscio <ruscio@tcnj.edu> and Shirley Wang <shirleywang@g.harvard.edu> Maintainer: John Ruscio <ruscio@tcnj.edu>

CalculateSkew *Calculates skew*

Description

This function calculates the sample skewness of a distribution

Usage

```
CalculateSkew(x)
```

Arguments

x The data vector

Details

Called by higher-order functions; users do not need to call this function directly.

Value

The sample skewness of x

Author(s)

John Ruscio <ruscio@tcnj.edu> and Shirley Wang <shirleywang@g.harvard.edu> Maintainer: John Ruscio <ruscio@tcnj.edu>

CalculateValidity *Calculates Validity*

Description

This function calculates the standardized mean difference between two groups (Cohen's D)

Usage

```
CalculateValidity(x.1, x.2)
```

Arguments

x.1 Data for the first group
x.2 Data for the second group

Details

Called by higher-order functions; users do not need to call this function directly.

Value

The standardized mean difference between groups

Author(s)

John Ruscio <ruscio@tcnj.edu> and Shirley Wang <shirleywang@g.harvard.edu> Maintainer: John Ruscio <ruscio@tcnj.edu>

CheckClassification *Checks classification*

Description

This function checks classification for problems, and terminates the program if necessary

Usage

```
CheckClassification(group, n)
```

Arguments

group	Classification of cases
n	Sample size

Details

Called by higher-order functions; users do not need to call this function directly.

Value

Nothing; text output if problem occurs

Author(s)

John Ruscio <ruscio@tcnj.edu> and Shirley Wang <shirleywang@g.harvard.edu> Maintainer: John Ruscio <ruscio@tcnj.edu>

CheckData

Checks supplied data set

Description

This function checks whether the supplied empirical data set is appropriate for taxometric analysis, and provides descriptive statistics about the data set. If data do not meet certain requirements, the program prints warnings in the output, with details about which specific criteria are not met.

Usage

```
CheckData(x)
```

Arguments

x The supplied data matrix. Cases missing any data will be removed prior to analysis.

Details

This function should be called directly by users before performing any taxometric procedures.

Value

This program returns nothing, and provides text output only.

Author(s)

John Ruscio <ruscio@tcnj.edu> and Shirley Wang <shirleywang@g.harvard.edu> Maintainer: John Ruscio <ruscio@tcnj.edu>

Examples

```
# create or import data set

# creates a categorical data set
test.cat <- CreateData("cat")
# Checks data
CheckData(test.cat)

# creates a dimensional data set
test.dim <- CreateData("dim")
# Checks data
CheckData(test.dim)
```

CheckParameters	<i>Checks parameters</i>
-----------------	--------------------------

Description

This function checks the parameter specifications for problems, and adjusts these parameters as needed.

Usage

```
CheckParameters(x, parameters)
```

Arguments

x	The data matrix
parameters	The data and program parameters

Details

Called by higher-order functions; users do not need to call this function directly.

Value

Data parameters, adjusted as needed

Author(s)

John Ruscio <ruscio@tcnj.edu> and Shirley Wang <shirleywang@g.harvard.edu> Maintainer: John Ruscio <ruscio@tcnj.edu>

ClassifyCases	<i>Assigns cases to groups</i>
---------------	--------------------------------

Description

This function assigns cases to groups using the base-rate classification technique. Cases are sorted according to their total scores on all indicators, and the highest-scoring cases are assigned to the taxon such that the proportion of taxon members equals the specified base rate estimate.

Usage

```
ClassifyCases(x, p, cols = 0)
```

Arguments

x	The supplied data matrix.
p	The base rate estimate that will be used to classify cases.
cols	The column numbers that contain variables

Details

Users should call this function directly if they wish to assign cases to groups.

Value

Data matrix with a new classification variable.

Author(s)

John Ruscio <ruscio@tcnj.edu> and Shirley Wang <shirleywang@g.harvard.edu> Maintainer: John Ruscio <ruscio@tcnj.edu>

References

Ruscio, J. (2009). Assigning cases to groups using taxometric results: an empirical comparison of classification techniques. *Assessment*, 16(1), 55-70.

CreateData

Creates a data set

Description

This function creates an artificial data set based on either dimensional or categorical latent structure, which can vary according to a number of basic parameters. Such data can be useful for getting to know the taxometric programs and becoming familiar with their output by conducting analyses using data sets whose parameters are known.

Usage

```
CreateData(str, n = 600, k = 4, p = 0.5, d = 2, r = 0, r.tax = 0, r.comp = 0,
g = 0, h = 0, cuts = 0, uniform = F, seed = 1)
```

Arguments

str	The type of data to be generated. Specify either "dim" for dimensional data or "cat" (or anything else) for categorical data.
n	Sample size. The default value is 600.
k	Number of variables. The default value is 4.
p	Taxon base rate. The default value is .5.
d	Standardized mean difference between groups. The default value is 2.

r	Correlation among variables. The default value is 0.
r.tax	Correlation among variables within the taxon. The default value is 0.
r.comp	Correlation among variables within the complement. The default value is 0.
g	Parameter used to control asymmetry (scalar); sign indicates direction and absolute value indicates magnitude of skew (e.g., +/- .30 yields substantial asymmetry).
h	Parameter used to control tail weight (scalar); positive values yield tails that are longer/thinner than a standard normal curve, negative values do the reverse (e.g., +/- .15 is a substantial departure from normality).
cuts	Parameter used to create ordered categories, if nonzero (scalar); number of categories will be cuts + 1.
uniform	Whether to generate random values (the program default) or use uniformly distributed quantiles (T/F).
seed	Random number seed; specifying the same seed enables users to generate and analyze identical data sets. The default value is 1.

Details

Users should call this function directly if they wish to create an artificial data set.

Value

Data matrix; k columns contain data, final column contains classification.

Author(s)

John Ruscio <ruscio@tcnj.edu> and Shirley Wang <shirleywang@g.harvard.edu> Maintainer: John Ruscio <ruscio@tcnj.edu>

Examples

```
# creates a categorical data set
test.cat <- CreateData("cat")

# creates a dimensional data set
test.dim <- CreateData("dim")
```

CreateSample	<i>Creates sample of data</i>
--------------	-------------------------------

Description

Generates sample of correlated data with univariate g-and-h distributions.

Usage

```
CreateSample(n, k, r, g, h, uniform)
```

Arguments

n	Sample size
k	Number of variables
r	Correlation among variables
g	Parameter used to control asymmetry (scalar); sign indicates direction and absolute value indicates magnitude of skew (e.g., +/- .30 yields substantial asymmetry).
h	Parameter used to control tail weight (scalar); positive values yield tails that are longer/thinner than a standard normal curve, negative values do the reverse (e.g., +/- .15 is a substantial departure from normality).
uniform	Whether to generate random values (the program default) or use uniformly distributed quantiles (T/F).

Details

Called by higher-order functions; users do not need to call this function directly.

Value

Sample of data

Author(s)

John Ruscio <ruscio@tcnj.edu> and Shirley Wang <shirleywang@g.harvard.edu> Maintainer: John Ruscio <ruscio@tcnj.edu>

CreateVariable	<i>Creates a variable</i>
----------------	---------------------------

Description

Generates variable with g-and-h distribution.

Usage

```
CreateVariable(n, g, h, uniform)
```

Arguments

n	Size of sample to create
g	Parameter used to control asymmetry (scalar); sign indicates direction and absolute value indicates magnitude of skew (e.g., +/- .30 yields substantial asymmetry).
h	Parameter used to control tail weight (scalar); positive values yield tails that are longer/thinner than a standard normal curve, negative values do the reverse (e.g., +/- .15 is a substantial departure from normality).
uniform	Whether to generate random values (the program default) or use uniformly distributed quantiles (T/F).

Details

Called by higher-order functions; users do not need to call this function directly.

Value

Single variable

Author(s)

John Ruscio <ruscio@tcnj.edu> and Shirley Wang <shirleywang@g.harvard.edu> Maintainer: John Ruscio <ruscio@tcnj.edu>

DisplayPanels	<i>Displays panels of graphs</i>
---------------	----------------------------------

Description

This function provides panels of graphs for taxometric analysis

Usage

```
DisplayPanels(x.results, x.dim.results, x.cat.results, parameters)
```

Arguments

x.results	Empirical data results
x.dim.results	Dimensional comparison data results
x.cat.results	Categorical comparison data results
parameters	The data and program parameters

Details

Called by higher-order functions; users do not need to call this function directly.

Value

This function returns nothing, and provides graphical output only

Author(s)

John Ruscio <ruscio@tcnj.edu> and Shirley Wang <shirleywang@g.harvard.edu> Maintainer: John Ruscio <ruscio@tcnj.edu>

DisplayProfiles	<i>Plots CCFI Profiles</i>
-----------------	----------------------------

Description

This function plots CCFI profiles

Usage

```
DisplayProfiles(CCFIs, parameters)
```

Arguments

CCFIs	CCFI values across base rates and procedures
parameters	The data and program parameters

Details

Called by higher-order functions; users do not need to call this function directly.

Value

This function returns nothing, and provides graphical output only

Author(s)

John Ruscio <ruscio@tcnj.edu> and Shirley Wang <shirleywang@g.harvard.edu> Maintainer: John Ruscio <ruscio@tcnj.edu>

EstimateLMode	<i>Estimates L-Mode base rate</i>
---------------	-----------------------------------

Description

This function estimates the taxon base rate for an L-Mode curve

Usage

```
EstimateLMode(curve.x, curve.y, parameters)
```

Arguments

curve.x	X values of density
curve.y	Y values of density
parameters	The data and program parameters

Details

Called by higher-order functions; users do not need to call this function directly.

Value

List of base rate estimates:

p.r	Based on location of left mode
p.l	Based on location of right mode
p.estimate	mean

Author(s)

John Ruscio <ruscio@tcnj.edu> and Shirley Wang <shirleywang@g.harvard.edu> Maintainer: John Ruscio <ruscio@tcnj.edu>

EstimateMAMBAC	<i>Estimates MAMBAC base rate</i>
----------------	-----------------------------------

Description

This function estimates the taxon base rate for a MAMBAC curve

Usage

```
EstimateMAMBAC(curve)
```

Arguments

curve	MAMBAC curve
-------	--------------

Details

Called by higher-order functions; users do not need to call this function directly.

Value

Base rate estimate

Author(s)

John Ruscio <ruscio@tcnj.edu> and Shirley Wang <shirleywang@g.harvard.edu> Maintainer: John Ruscio <ruscio@tcnj.edu>

EstimateMAXEIG	<i>Estimates MAXEIG base rate</i>
----------------	-----------------------------------

Description

This function estimates the taxon base rate for a MAXEIG curve

Usage

```
EstimateMAXEIG(curve)
```

Arguments

curve	MAXEIG curve
-------	--------------

Details

Called by higher-order functions; users do not need to call this function directly.

Value

Base rate estimate

Author(s)

John Ruscio <ruscio@tcnj.edu> and Shirley Wang <shirleywang@g.harvard.edu> Maintainer: John Ruscio <ruscio@tcnj.edu>

EstimateMAXSLOPE	<i>Estimates MAXSLOPE base rate</i>
------------------	-------------------------------------

Description

This function estimates the taxon base rate for a MAXSLOPE curve

Usage

```
EstimateMAXSLOPE(curve.x, curve.y)
```

Arguments

curve.x	X values of curve
curve.y	Y values of curve

Details

Called by higher-order functions; users do not need to call this function directly.

Value

Base rate estimate

Author(s)

John Ruscio <ruscio@tcnj.edu> and Shirley Wang <shirleywang@g.harvard.edu> Maintainer: John Ruscio <ruscio@tcnj.edu>

GenerateData	<i>Generates comparison data</i>
--------------	----------------------------------

Description

This function generates a population of comparison data

Usage

```
GenerateData(x, n, n.factors = 0, max.trials = 5, initial.multiplier = 1)
```

Arguments

x	The data matrix
n	Size of population to create
n.factors	The number of factors used to reproduce correlations. The default value is 0.
max.trials	Maximum number of trials. The default value is 5.
initial.multiplier	Size of multiplier to adjust target correlations. The default value is 1.

Details

Called by higher-order functions; users do not need to call this function directly.

Value

Population of comparison data

Author(s)

John Ruscio <ruscio@tcnj.edu> and Shirley Wang <shirleywang@g.harvard.edu> Maintainer: John Ruscio <ruscio@tcnj.edu>

GetSpecifications	<i>Provides analytic specifications</i>
-------------------	---

Description

This function provides analytic specifications

Usage

```
GetSpecifications(parameters)
```

Arguments

parameters	The data and program parameters
------------	---------------------------------

Details

Called by higher-order functions; users do not need to call this function directly.

Value

This function returns nothing, and provides text output only

Author(s)

John Ruscio <ruscio@tcnj.edu> and Shirley Wang <shirleywang@g.harvard.edu> Maintainer: John Ruscio <ruscio@tcnj.edu>

PlotPanel	<i>Plots a panel of curves</i>
-----------	--------------------------------

Description

This function plots a two-panel graph with results for empirical and comparison data

Usage

```
PlotPanel(x.results, x.dim.results, x.cat.results, parameters, procedure)
```

Arguments

x.results	Empirical data results
x.dim.results	Dimensional comparison data results
x.cat.results	Categorical comparison data results
parameters	The data and program parameters
procedure	Name of taxometric procedure

Details

Called by higher-order functions; users do not need to call this function directly.

Value

This function returns nothing, and provides graphical output only

Author(s)

John Ruscio <ruscio@tcnj.edu> and Shirley Wang <shirleywang@g.harvard.edu> Maintainer: John Ruscio <ruscio@tcnj.edu>

ProcessProfile	<i>Calculates CCFIs and base rates for CCFI profile</i>
----------------	---

Description

This function calculates the aggregated CCFI and base rate estimate for one CCFI profile

Usage

```
ProcessProfile(CCFIs, parameters)
```

Arguments

CCFIs	CCFI values across base rates for a single procedure
parameters	The data and program parameters

Details

Called by higher-order functions; users do not need to call this function directly.

Value

List of aggregated CCFI and base rate estimate

CCFI	Aggregated CCFI
p.est	Base rate estimate

Author(s)

John Ruscio <ruscio@tcnj.edu> and Shirley Wang <shirleywang@g.harvard.edu> Maintainer: John Ruscio <ruscio@tcnj.edu>

RemoveMissingData	<i>Removes missing data</i>
-------------------	-----------------------------

Description

This function performs listwise deletion of missing data

Usage

```
RemoveMissingData(x)
```

Arguments

x	The data matrix
---	-----------------

Details

Called by higher-order functions; users do not need to call this function directly.

Value

Data after listwise deletion of missing data

Author(s)

John Ruscio <ruscio@tcnj.edu> and Shirley Wang <shirleywang@g.harvard.edu> Maintainer: John Ruscio <ruscio@tcnj.edu>

RunCCFIProfile	<i>Performs taxometric analyses to generate a CCFI profile</i>
----------------	--

Description

This function performs a series of taxometric analysis using categorical comparison data sets that vary in taxon base rates, and plots a profile of CCFI values across this range of base rates. Results can be assigned to an object to store results; otherwise results will be displayed on-screen.

Usage

```
RunCCFIProfile(x, seed = 0, min.p = 0.025, max.p = 0.975, num.p = 39,  
n.pop = 1e+05, n.samples = 100, reps = 1, MAMBAC = TRUE, assign.MAMBAC = 1,  
n.cuts = 50, n.end = 25, MAXEIG = TRUE, assign.MAXEIG = 1, windows = 50,  
overlap = 0.9, LMode = TRUE, mode.l = -0.001, mode.r = 0.001, MAXSLOPE = FALSE,  
graph = 1, text.file = FALSE, profile = TRUE)
```

Arguments

x	Supplied data matrix. Cases missing any data will be removed prior to analysis.
seed	Random number seed provided prior to analysis of empirical data as well as prior to generating each population of comparison data. The default value is 0.
min.p	Minimum base rate for CCFI profile. The default value is .025.
max.p	Maximum base rate for CCFI profile. The default value is .975.
num.p	Number of base rates for CCFI profile. The default value is 39.
n.pop	Size of the finite populations of categorical and dimensional comparison data. The default value is 100,000.
n.samples	Number of comparison data sets of each structure to generate and analyze. The default value is 100.
reps	Number of times to resort cases along the input indicator at random and redo the calculations (if tied scores are found), averaging to obtain final results. The default value is 1 if no tied scores are found, and 10 if tied scores are found.
MAMBAC	Whether the MAMBAC procedure is performed. The default value is TRUE.
assign.MAMBAC	How variables are assigned as input and output variables in the MAMBAC procedure. Variables may be used in all possible input-output pairings (assign.MAMBAC = 1), or variables may be summed to form the input variable (assign.MAMBAC = 2). The default value is 1.
n.cuts	The total number of cuts to make along the input variable when performing the MAMBAC procedure. The default value is 25.
n.end	The number of cases to set aside at each extreme along the input variable before making the first and last cuts when performing the MAMBAC procedure. The default value is 25.
MAXEIG	Whether the MAXEIG procedure is performed. The default value is TRUE if k is ≥ 3 , and FALSE if $k < 3$.
assign.MAXEIG	How variables are assigned as input and output variables in the MAXEIG procedure. Variables may be used in all input-output triplets (assign.MAXEIG = 1), each variable may serve as input once (assign.MAXEIG = 2), or variables may be summed to form the input (assign.MAXEIG = 3). The default value is 1.
windows	The number of overlapping windows to use when performing the MAXEIG procedure. The default value is 50.
overlap	The amount of overlap between windows when performing the MAXEIG procedure. The default value is .90.
LMode	Whether the L-Mode procedure is performed. The default value is TRUE if k is ≥ 3 , and FALSE if $k < 3$.
mode.l	Position beyond which to search for the left mode when performing the L-Mode procedure. The default value is -.001.
mode.r	Position beyond which to search for the right mode when performing the L-Mode procedure. The default value is .001.
MAXSLOPE	Whether the MAXSLOPE procedure is performed. The default value is FALSE if $k \geq 3$, and TRUE if $k < 3$.

graph	Whether to display graphs on screen (1), save as a compressed .jpeg file (2), or save as a high-resolution .tiff file (3). The default value is 1.
text.file	Whether to divert text output to a .txt file (T/F). The default value is FALSE.
profile	Whether a CCFI profile is generated. The default value is TRUE.

Details

This function should be called directly by users who wish to perform taxometric analyses to generate a CCFI profile.

Value

This program returns CCFI values, and provides text and graphical output. Note that any CCFI values of 0 represent missing values, as analyses will never yield a CCFI of 0.

Author(s)

John Ruscio <ruscio@tcnj.edu> and Shirley Wang <shirleywang@g.harvard.edu> Maintainer: John Ruscio <ruscio@tcnj.edu>

RunFactorAnalysis *Performs factor analysis*

Description

This function performs factor analysis

Usage

```
RunFactorAnalysis(x, cor.matrix = FALSE, n.factors = 0, max.iter = 50, criterion = 0.01)
```

Arguments

x	The data or correlation matrix
cor.matrix	Whether x is a correlation matrix. The default is FALSE.
n.factors	The number of factors to use. The default value is 0.
max.iter	The maximum number of iterations. The default value is 50.
criterion	Acceptably small change in h2 between iterations. The default value is .01.

Details

Called by higher-order functions; users do not need to call this function directly.

Value

List of factor loadings and number of factors

loadings	The factor loadings
factors	The number of factors

Author(s)

John Ruscio <ruscio@tcnj.edu> and Shirley Wang <shirleywang@g.harvard.edu> Maintainer: John Ruscio <ruscio@tcnj.edu>

RunLMode	<i>Performs L-Mode</i>
----------	------------------------

Description

This function performs the L-Mode analysis

Usage

```
RunLMode(x)
```

Arguments

x	The data matrix
---	-----------------

Details

Called by higher-order functions; users do not need to call this function directly.

Value

L-Mode curve:

curve.x	X values of curve
curve.y	Y values of curve

Author(s)

John Ruscio <ruscio@tcnj.edu> and Shirley Wang <shirleywang@g.harvard.edu> Maintainer: John Ruscio <ruscio@tcnj.edu>

References

Waller, N.G., & Meehl, P.E. (1998). Multivariate taxometric procedures: Distinguishing types from continua. Thousand Oaks, CA, US: Sage Publications, Inc.

RunMAMBAC

Performs MAMBAC

Description

This function performs the MAMBAC analysis

Usage

RunMAMBAC(x, parameters)

Arguments

x The data matrix
parameters The data and program parameters

Details

Called by higher-order functions; users do not need to call this function directly.

Value

Panel of MAMBAC curves

Author(s)

John Ruscio <ruscio@tcnj.edu> and Shirley Wang <shirleywang@g.harvard.edu> Maintainer: John Ruscio <ruscio@tcnj.edu>

References

Meehl, P.E., & Yonce, L.J. (1994). Taxometric analysis: I. Detecting taxonomy with two quantitative indicators using means above and below a sliding cut (MAMBAC procedure). *Psychological Reports*, 74(3, Pt 2), 1059-1274.

RunMAXEIG

Performs MAXEIG

Description

This function performs the MAXEIG analysis

Usage

RunMAXEIG(x, parameters)

Arguments

x	The data matrix
parameters	The data and program parameters

Details

Called by higher-order functions; users do not need to call this function directly.

Value

Panel of MAXEIG curves:

curve.x	X values of curve
curve.y	Y values of curve

Author(s)

John Ruscio <ruscio@tcnj.edu> and Shirley Wang <shirleywang@g.harvard.edu> Maintainer: John Ruscio <ruscio@tcnj.edu>

References

Waller, N.G., & Meehl, P.E. (1998). *Multivariate taxometric procedures: Distinguishing types from continua*. Thousand Oaks, CA, US: Sage Publications, Inc.

RunMAXSLOPE	<i>Performs MAXSLOPE</i>
-------------	--------------------------

Description

This function performs the MAXSLOPE analysis

Usage

```
RunMAXSLOPE(x)
```

Arguments

x	The data matrix
---	-----------------

Details

Called by higher-order functions; users do not need to call this function directly.

Value

Panel of MAXSLOPE curves

curve.x X values of curve

curve.y Y values of curve

Author(s)

John Ruscio <ruscio@tcnj.edu> and Shirley Wang <shirleywang@g.harvard.edu> Maintainer: John Ruscio <ruscio@tcnj.edu>

References

Grove, W.M., & Meehl, P.E. (1993). Simple regression-based procedures for taxometric investigations. *Psychological Reports*, 73, 707-737.

RunProcedures

Runs taxometric procedures for empirical data

Description

This function runs the MAMBAC, MAXEIG, L-Mode, and MAXSLOPE analyses for empirical data

Usage

RunProcedures(x, parameters)

Arguments

x The data matrix

parameters The data and program parameters

Details

Called by higher-order functions; users do not need to call this function directly.

Value

A list of curve-level data for each procedure performed:

MAMBAC MAMBAC curve

MAXEIG.x X values of MAXEIG curve

MAXEIG.y Y values of MAXEIG curve

LMode.x X values of LMode curve

LMode.y Y values of LMode curve

MAXSLOPE.x X values of MAXSLOPE curve

MAXSLOPE.y Y values of MAXSLOPE curve

Author(s)

John Ruscio <ruscio@tcnj.edu> and Shirley Wang <shirleywang@g.harvard.edu> Maintainer: John Ruscio <ruscio@tcnj.edu>

RunProceduresComp *Runs taxometric procedures for comparison data*

Description

This function runs the MAMBAC, MAXEIG, L-Mode, and MAXSLOPE analyses for comparison data

Usage

```
RunProceduresComp(x, parameters)
```

Arguments

x	The data matrix
parameters	The data and program parameters.

Details

Called by higher-order functions; users do not need to call this function directly.

Value

A list of averaged curves for each procedure performed:

MAMBAC	MAMBAC curve
MAXEIG.x	X values of MAXEIG curve
MAXEIG.y	Y values of MAXEIG curve
LMode.x	X values of LMode curve
LMode.y	Y values of LMode curve
MAXSLOPE.x	X values of MAXSLOPE curve
MAXSLOPE.y	Y values of MAXSLOPE curve

Author(s)

John Ruscio <ruscio@tcnj.edu> and Shirley Wang <shirleywang@g.harvard.edu> Maintainer: John Ruscio <ruscio@tcnj.edu>

Description

Performs taxometric analysis for a sample of data and provides text (analytic specifications, CCFI values, base rate estimates) and graphical (panels of empirical data curves superimposed above comparison data curves) output. By default, the function will run MAMBAC, MAXEIG, and L-Mode, unless only 2 variables are provided, in which case the program will run MAMBAC and MAXSLOPE. Results can be assigned to an object to store results; otherwise results will be displayed on-screen.

Usage

```
RunTaxometrics(x, seed = 0, n.pop = 1e+05, n.samples = 100, reps = 1,
MAMBAC = TRUE, assign.MAMBAC = 1, n.cuts = 50, n.end = 25, MAXEIG =
TRUE, assign.MAXEIG = 1, windows = 50, overlap = 0.9, LMode = TRUE, mode.l =
-0.001, mode.r = 0.001, MAXSLOPE = FALSE, graph = 1)
```

Arguments

x	The supplied data matrix. Cases missing any data will be removed prior to analysis.
seed	Random number seed provided prior to analysis of empirical data as well as prior to generating each population of comparison data. The default value is 0.
n.pop	Size of the finite populations of categorical and dimensional comparison data. The default value is 100,000.
n.samples	Number of comparison data sets of each structure to generate and analyze. The default value is 100.
reps	Number of times to resort cases along the input indicator at random and redo the calculations (if tied scores are found), averaging to obtain final results. The default value is 1 if no tied scores are found, and 10 if tied scores are found.
MAMBAC	Whether the MAMBAC procedure is performed. The default value is TRUE.
assign.MAMBAC	How variables are assigned as input and output variables in the MAMBAC procedure. Variables may be used in all possible input-output pairings (assign.MAMBAC = 1), or variables may be summed to form the input variable (assign.MAMBAC = 2). The default value is 1.
n.cuts	The total number of cuts to make along the input variable when performing the MAMBAC procedure. The default value is 25.
n.end	The number of cases to set aside at each extreme along the input variable before making the first and last cuts when performing the MAMBAC procedure. The default value is 25.
MAXEIG	Whether the MAXEIG procedure is performed. The default value is TRUE if k is ≥ 3 , and FALSE if $k < 3$.

assign.MAXEIG	How variables are assigned as input and output variables in the MAXEIG procedure. Variables may be used in all input-output triplets (assign.MAXEIG = 1), each variable may serve as input once (assign.MAXEIG = 2), or variables may be summed to form the input (assign.MAXEIG = 3). The default value is 1.
windows	The number of overlapping windows to use when performing the MAXEIG procedure. The default value is 50.
overlap	The amount of overlap between windows when performing the MAXEIG procedure. The default value is .90.
LMode	Whether the L-Mode procedure is performed. The default value is TRUE if $k \geq 3$, and FALSE if $k < 3$.
mode.l	Position beyond which to search for the left mode when performing the L-Mode procedure. The default value is -.001.
mode.r	Position beyond which to search for the right mode when performing the L-Mode procedure. The default value is .001.
MAXSLOPE	Whether the MAXSLOPE procedure is performed. The default value is FALSE if $k \geq 3$, and TRUE if $k < 3$.
graph	Whether to display graphs on screen (1), save as a compressed .jpeg file (2), or save as a high-resolution .tiff file (3). The default value is 1.

Details

This function should be called directly by users who wish to perform taxometric analyses for a sample of data.

Value

This program returns CCFI values, and provides text and graphical output. Note that any CCFI values of 0 represent missing values, as analyses will never yield a CCFI of 0.

Author(s)

John Ruscio <ruscio@tcnj.edu> and Shirley Wang <shirleywang@g.harvard.edu> Maintainer: John Ruscio <ruscio@tcnj.edu>

SummarizeDist

Summarizes distribution

Description

This function calculates the sample mean, standard deviation, skewness, and kurtosis

Usage

SummarizeDist(x)

Arguments

x The data vector

Details

Called by higher-order functions; users do not need to call this function directly.

Value

The sample mean, standard deviation, skewness, and kurtosis of x .

Author(s)

John Ruscio <ruscio@tcnj.edu> and Shirley Wang <shirleywang@g.harvard.edu> Maintainer: John Ruscio <ruscio@tcnj.edu>

Index

AddVariance, [2](#)
AssignMAMBAC, [3](#)
AssignMAXEIG, [4](#)

CalculateBaseRates, [4](#)
CalculateCCFI, [5](#)
CalculateCCFIs, [6](#)
CalculateCCFIsProfile, [6](#)
CalculateFitDensities, [7](#)
CalculateKurtosis, [8](#)
CalculateLModeCCFI, [8](#)
CalculateMAMBAC, [9](#)
CalculateMAXEIG, [10](#)
CalculateMAXSLOPE, [10](#)
CalculateProfileOutput, [11](#)
CalculateSkew, [12](#)
CalculateValidity, [12](#)
CheckClassification, [13](#)
CheckData, [14](#)
CheckParameters, [15](#)
ClassifyCases, [15](#)
CreateData, [16](#)
CreateSample, [17](#)
CreateVariable, [18](#)

DisplayPanels, [19](#)
DisplayProfiles, [20](#)

EstimateLMode, [20](#)
EstimateMAMBAC, [21](#)
EstimateMAXEIG, [22](#)
EstimateMAXSLOPE, [22](#)

GenerateData, [23](#)
GetSpecifications, [24](#)

PlotPanel, [24](#)
ProcessProfile, [25](#)

RemoveMissingData, [26](#)
RunCCFIProfile, [26](#)
RunFactorAnalysis, [28](#)
RunLMode, [29](#)
RunMAMBAC, [30](#)
RunMAXEIG, [30](#)
RunMAXSLOPE, [31](#)
RunProcedures, [32](#)
RunProceduresComp, [33](#)
RunTaxometrics, [34](#)

SummarizeDist, [35](#)