Package ‘plotSEMM’

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Type Package

Title Graphing Nonlinear Relations Among Latent Variables from Structural Equation Mixture Models

Version 2.4

Description Contains a graphical user interface to generate the diagnostic plots proposed by Bauer (2005; <doi:10.1207/s15328007sem1204_1>), Pek & Chalmers (2015; <doi:10.1080/10705511.2014.937790>), and Pek, Chalmers, R. Kok, & Losardo (2015; <doi:10.3102/1076998615589129>) to investigate nonlinear bivariate relationships in latent regression models using structural equation mixture models (SEMMs).

Depends plyr, shiny

Imports graphics, methods, stats, MplusAutomation, Rcpp, plotrix

License GPL (>= 2)

LazyLoad yes

LazyData yes

LinkingTo Rcpp

Repository CRAN

URL https://github.com/philchalmers/plotSEMM

RoxygenNote 6.0.1

NeedsCompilation yes

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plotSEMM

Graphing Nonlinear Relations Among Latent Variables from Structural Equation Mixture Models

Description

Graphing Nonlinear Relations Among Latent Variables from Structural Equation Mixture Models

Details

Contains a graphical user interface to generate the diagnostic plots proposed by Bauer (2005) and Pek & Chalmers (2015) to investigate nonlinear latent variable interactions in latent regression models.

Creates plots which accompany Bauers (2005) semiparametric method of modeling Structural Equation Mixture Models (SEMMs) by allowing researchers to visualize potential nonlinear relationships between a latent predictor and outcome. Additionally, a graphical user interface (GUI) is available for interactive use and is found in the function plotSEMM_GUI.

Author(s)

Bethany Kok and Phil Chalmers <rphilip.chalmers@gmail.com>

References


Description

Requires plotSEMM_setup be run first. Generates (a) the potential nonlinear regression function; (b) bivariate distribution of the latent variables; (c) marginal distributions of the latent variables; (d) within class linear regression functions; and (e) within class marginal distributions for the latent variables.

Usage

plotSEMM_contour(SEMLIdatapks, EtaN2 = "Eta2", EtaN1 = "Eta1", classinfo = TRUE, lnty = 3, lncol = 1, title = "", leg = TRUE, cex = 1.5, ...)

Arguments

SEMLIdatapks object returned from plotSEMM_setup
EtaN2 Label for the X axis. If no value is provided, defaults to "Eta2."
EtaN1 Label for the Y axis. If no value is provided, defaults to "Eta1."
classinfo Logical variable. TRUE shows the lines for each class as well as the combined estimate. FALSE shows only the combined estimate. If no value is provided, defaults to TRUE.
lnty Determines the line types used for the class lines. If no value is provided, defaults to 3. See par for information about line type.
lncol Determines the line colors used for the class lines. If no value is provided, defaults to 1. See par for information about line type.
title Titles the graph.
leg Logical variable. If TRUE, a legend accompanies the graph. If FALSE, no legend appears. Defaults to TRUE.
cex par(cex) value. Default is 1.5
... addition inputs, mostly from plotSEMM_GUI()

Author(s)

Bethany Kok and Phil Chalmers <rphilip.chalmers@gmail.com>

References


## Examples

```r
## Not run:
## code for latent variables with two classes
pi <- c(0.602, 0.398)

alpha1 <- c(3.529, 2.317)
alpha2 <- c(0.02, 0.336)
beta21 <- c(0.152, 0.053)
psi11 <- c(0.265, 0.265)
psi22 <- c(0.023, 0.023)

plotobj <- plotSEMM_setup(pi, alpha1, alpha2, beta21, psi11, psi22)

plotSEMM_contour(plotobj)

plotSEMM_contour(plotobj, EtaN1 = "Latent Predictor",
                 EtaN2 = "Latent Outcome", classinfo = FALSE, lncol = 5)

## End(Not run)
```

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### Description

Graphical user interface with the shiny package. Supports manual input as well as importing from precomputed Mplus files. An online tutorial and additional materials can be found at [http://www.yorku.ca/pek/index_files/appendices.htm](http://www.yorku.ca/pek/index_files/appendices.htm)

### Usage

```r
plotSEMM_GUI(...)  
```

### Arguments

- `...`: additional arguments passed to shiny::runApp, such as `launch.browser = TRUE`

### Author(s)

Phil Chalmers (<rphilip.chalmers@gmail.com>) and Jolynn Pek
References


Examples

```r
## not run:
plotSEMM_GUI()
plotSEMM_GUI(launch.browser=TRUE) # if using Rstudio, will launch system browser default
## End(Not run)
```

plotSEMM_probability  Probability plot

Description

Requires plotSEMM_setup be run first. Generates a plot which expresses the mixing probabilities for each latent class conditioned on the latent predictor.

Usage

```r
plotSEMM_probability(SEMLIdatapks, EtaName = "Eta1", lnty = 3, lncol = 1,
                      title = "", leg = TRUE, cex = 1.5, ...)
```

Arguments

- `SEMLIdatapks`: object returned from `plotSEMM_setup`
- `EtaName`: Label of the latent predictor. If no value is provided, defaults to Eta1.
- `lnty`: Determines the line types used for the class lines. If no value is provided, defaults to 3. See `par` for information about line type.
- `lncol`: Determines the line colors used for the class lines. If no value is provided, defaults to 1. See `par` for information about line type.
- `title`: Titles the graph.
plotSEMM_probability

leg logical variable. If TRUE, a legend accompanies the graph. If FALSE, no legend appears. Defaults to TRUE.
cex par(cex) value. Default is 1.5
... addition inputs, mostly from plotSEMM_GUI()

Author(s)

Bethany Kok and Phil Chalmers <rphilip.chalmers@gmail.com>

References


See Also

plotSEMM_setup, plotSEMM_contour

Examples

## Not run:
# 2 class empirical example on positive emotions and heuristic processing in
# Pek, Sterba, Kok & Bauer (2009)
pi <- c(0.602, 0.398)
alpha1 <- c(3.529, 2.317)
alpha2 <- c(0.02, 0.336)
beta21 <- c(0.152, 0.053)
psi11 <- c(0.265, 0.265)
psi22 <- c(0.023, 0.023)

plotobj <- plotSEMM_setup(pi, alpha1, alpha2, beta21, psi11, psi22)
plotSEMM_probability(plotobj)
plotSEMM_probability(plotobj, EtaName = "Latent Predictor", lnty = 2, title = "Probability")
## End(Not run)
plotSEMM_setup

Set up function for plotSEMM

Description

Takes user input generated from SEMM software such as Mplus (Muthen & Muthen, 2007), Mx (Neale, Boker, Xie & Maes, 2004) or MECOSA (Arminger, Wittenberg, & Schepers, 1996) in Gauss and generates model predicted data for processing in graphing functions plotSEMM_contour and plotSEMM_probability. Returns a data.frame to be passed to other functions in the package.

Usage

plotSEMM_setup(pi, alpha1, alpha2, beta21, psi11, psi22, points = 50)

Arguments

- **pi**: Vector: $K$ marginal class probabilities.
- **alpha1**: Vector: $K$ means of the latent predictor.
- **alpha2**: Vector: $K$ intercepts slopes from the within-class regression of the latent outcome on the latent predictor.
- **beta21**: Vector: $K$ slopes from the within-class regression of the latent outcome on the latent predictor.
- **psi11**: Vector: $K$ within-class variances of the latent predictor.
- **psi22**: Vector: $K$ within-class variances of the latent outcome.
- **points**: number of points to use. Default is 50.

Details

All the parameter estimates required by the arguments are generated from software with the capability of estimating SEMMs.

Author(s)

Bethany Kok and Phil Chalmers <rphilip.chalmers@gmail.com>

References


See Also

plotSEMM_contour, plotSEMM_probability

Examples

## Not run:
# 2 class empirical example on positive emotions and heuristic processing
# in Pek, Sterba, Kok & Bauer (2009)
pi <- c(0.502, 0.398)

alpha1 <- c(3.529, 2.317)
alpha2 <- c(0.02, 0.336)
beta21 <- c(0.152, 0.053)
psi11 <- c(0.265, 0.265)
psi22 <- c(0.023, 0.023)

plotobj <- plotSEMM_setup(pi, alpha1, alpha2, beta21, psi11, psi22)

## End(Not run)
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