

Package ‘interplot’

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Title Plot the Effects of Variables in Interaction Terms

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Description Plots the conditional coefficients (“marginal effects”) of variables included in multiplicative interaction terms.

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Imports stats, dplyr

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interplot

*Plot Conditional Coefficients of a Variable in an Interaction Term***Description**

interplot is a generic function to produce a plot of the coefficient estimates of one variable in a two-way interaction conditional on the values of the other variable in the interaction term. The function invokes particular methods which depend on the `class` of the first argument.

Usage

```
interplot(m, var1, var2, plot = TRUE, steps = NULL, ci = 0.95,
  hist = FALSE, var2_dt = NA, point = FALSE, sims = 5000, xmin = NA,
  xmax = NA, ercolor = NA, esize = 0.5, ralpha = 0.5,
  rfill = "grey70", ...)
```

Arguments

<code>m</code>	A model object including an interaction term, or, alternately, a data frame generated by an earlier call to interplot using the argument <code>plot = FALSE</code> .
<code>var1</code>	The name (as a string) of the variable of interest in the interaction term; its conditional coefficient estimates will be plotted.
<code>var2</code>	The name (as a string) of the other variable in the interaction term
<code>plot</code>	A logical value indicating whether the output is a plot or a dataframe including the conditional coefficient estimates of <code>var1</code> , their upper and lower bounds, and the corresponding values of <code>var2</code> .
<code>steps</code>	Desired length of the sequence. A non-negative number, which for <code>seq</code> and <code>seq.int</code> will be rounded up if fractional. The default is 100 or the unique categories in the <code>var2</code> (when it is less than 100. Also see unique).
<code>ci</code>	A numeric value defining the confidence intervals. The default value is 95% (0.95).
<code>hist</code>	A logical value indicating if there is a histogram of ‘ <code>var2</code> ’ added at the bottom of the conditional effect plot.
<code>var2_dt</code>	A numerical value indicating the frequency distribution of ‘ <code>var2</code> ’. It is only used when ‘ <code>hist == TRUE</code> ’. When the object is a model, the default is the distribution of ‘ <code>var2</code> ’ of the model.
<code>point</code>	A logical value determining the format of plot. By default, the function produces a line plot when <code>var2</code> takes on ten or more distinct values and a point (dot-and-whisker) plot otherwise; option <code>TRUE</code> forces a point plot.
<code>sims</code>	Number of independent simulation draws used to calculate upper and lower bounds of coefficient estimates: lower values run faster; higher values produce smoother curves.
<code>xmin</code>	A numerical value indicating the minimum value shown of <code>x</code> shown in the graph. Rarely used.

<code>xmax</code>	A numerical value indicating the maximum value shown of x shown in the graph. Rarely used.
<code>ercolor</code>	A character value indicating the outline color of the whisker or ribbon.
<code>esize</code>	A numerical value indicating the size of the whisker or ribbon.
<code>ralpha</code>	A numerical value indicating the transparency of the ribbon.
<code>rfill</code>	A character value indicating the filling color of the ribbon.
<code>...</code>	Other ggplot aesthetics arguments for points in the dot-whisker plot or lines in the line-ribbon plots. Not currently used.

Details

`interplot` visualizes the changes in the coefficient of one term in a two-way interaction conditioned by the other term. In the current version, the function works with interactions in the following classes of models:

- Ordinary linear models (object class: `lm`);
- Generalized linear models (object class: `glm`);
- Linear mixed-effects models (object class: `lmerMod`);
- Generalized linear mixed-effects models (object class: `glmerMod`);
- Ordinary linear models with imputed data (object class: `list`);
- Generalized linear models with imputed data (object class: `list`);
- Linear mixed-effects models with imputed data (object class: `list`);
- Generalized linear mixed-effects models with imputed data (object class: `list`).

The examples below illustrate how methods invoked by this generic deal with different type of objects.

Because the output function is based on [ggplot](#), any additional arguments and layers supported by `ggplot2` can be added with the `+`.

Value

The function returns a `ggplot` object.

Examples

```
data(mtcars)
m_cyl <- lm(mpg ~ wt * cyl, data = mtcars)
library(interplot)

# Plot interactions with a continuous conditioning variable
interplot(m = m_cyl, var1 = 'cyl', var2 = 'wt') +
  xlab('Automobile Weight (thousands lbs)') +
  ylab('Estimated Coefficient for Number of Cylinders') +
  ggtitle('Estimated Coefficient of Engine Cylinders\non Mileage by Automobile Weight') +
  theme(plot.title = element_text(face='bold'))
```

```
# Plot interactions with a categorical conditioning variable
interplot(m = m_cyl, var1 = 'wt', var2 = 'cyl') +
  xlab('Number of Cylinders') +
  ylab('Estimated Coefficient for Automobile Weight (thousands lbs)') +
  ggtitle('Estimated Coefficient of Automobile Weight \non Mileage by Engine Cylinders') +
  theme(plot.title = element_text(face='bold'))
```

interplot.default *Plot Conditional Coefficients in (Generalized) Linear Models with Interaction Terms*

Description

interplot.default is a method to calculate conditional coefficient estimates from the results of (generalized) linear regression models with interaction terms.

Usage

```
## Default S3 method:
interplot(m, var1, var2, plot = TRUE, steps = NULL,
  ci = 0.95, hist = FALSE, var2_dt = NA, point = FALSE, sims = 5000,
  xmin = NA, xmax = NA, ercolor = NA, esize = 0.5, ralpha = 0.5,
  rfill = "grey70", ...)
```

Arguments

m	A model object including an interaction term, or, alternately, a data frame recording conditional coefficients.
var1	The name (as a string) of the variable of interest in the interaction term; its conditional coefficient estimates will be plotted.
var2	The name (as a string) of the other variable in the interaction term.
plot	A logical value indicating whether the output is a plot or a dataframe including the conditional coefficient estimates of var1, their upper and lower bounds, and the corresponding values of var2.
steps	Desired length of the sequence. A non-negative number, which for seq and seq.int will be rounded up if fractional. The default is 100 or the unique categories in the var2 (when it is less than 100. Also see unique).
ci	A numeric value defining the confidence intervals. The default value is 95% (0.95).
hist	A logical value indicating if there is a histogram of 'var2' added at the bottom of the conditional effect plot.
var2_dt	A numerical value indicating the frequency distribution of 'var2'. It is only used when 'hist == TRUE'. When the object is a model, the default is the distribution of 'var2' of the model.

point	A logical value determining the format of plot. By default, the function produces a line plot when var2 takes on ten or more distinct values and a point (dot-and-whisker) plot otherwise; option TRUE forces a point plot.
sims	Number of independent simulation draws used to calculate upper and lower bounds of coefficient estimates: lower values run faster; higher values produce smoother curves.
xmin	A numerical value indicating the minimum value shown of x shown in the graph. Rarely used.
xmax	A numerical value indicating the maximum value shown of x shown in the graph. Rarely used.
ercolor	A character value indicating the outline color of the whisker or ribbon.
esize	A numerical value indicating the size of the whisker or ribbon.
ralpha	A numerical value indicating the transparency of the ribbon.
rfill	A character value indicating the filling color of the ribbon.
...	Other ggplot aesthetics arguments for points in the dot-whisker plot or lines in the line-ribbon plots. Not currently used.

Details

interplot.default is a S3 method from the interplot. It works on two classes of objects:

- Ordinary linear models (object class: lm);
- Generalized linear models (object class: glm).

Because the output function is based on [ggplot](#), any additional arguments and layers supported by [ggplot2](#) can be added with the +.

Value

The function returns a ggplot object.

interplot.lmerMod	<i>Plot Conditional Coefficients in Mixed-Effects Models with Interaction Terms</i>
-------------------	---

Description

interplot.mlm is a method to calculate conditional coefficient estimates from the results of multi-level (mixed-effects) regression models with interaction terms.

Usage

```
## S3 method for class 'lmerMod'
interplot(m, var1, var2, plot = TRUE, steps = NULL,
  ci = 0.95, hist = FALSE, var2_dt = NA, point = FALSE, sims = 5000,
  xmin = NA, xmax = NA, ercolor = NA, esize = 0.5, ralpha = 0.5,
  rfill = "grey70", ...)
```

Arguments

<code>m</code>	A model object including an interaction term, or, alternately, a data frame recording conditional coefficients.
<code>var1</code>	The name (as a string) of the variable of interest in the interaction term; its conditional coefficient estimates will be plotted.
<code>var2</code>	The name (as a string) of the other variable in the interaction term.
<code>plot</code>	A logical value indicating whether the output is a plot or a dataframe including the conditional coefficient estimates of <code>var1</code> , their upper and lower bounds, and the corresponding values of <code>var2</code> .
<code>steps</code>	Desired length of the sequence. A non-negative number, which for <code>seq</code> and <code>seq.int</code> will be rounded up if fractional. The default is 100 or the unique categories in the <code>var2</code> (when it is less than 100. Also see unique).
<code>ci</code>	A numeric value defining the confidence intervals. The default value is 95% (0.95).
<code>hist</code>	A logical value indicating if there is a histogram of <code>'var2'</code> added at the bottom of the conditional effect plot.
<code>var2_dt</code>	A numerical value indicating the frequency distribution of <code>'var2'</code> . It is only used when <code>'hist == TRUE'</code> . When the object is a model, the default is the distribution of <code>'var2'</code> of the model.
<code>point</code>	A logical value determining the format of plot. By default, the function produces a line plot when <code>var2</code> takes on ten or more distinct values and a point (dot-and-whisker) plot otherwise; option <code>TRUE</code> forces a point plot.
<code>sims</code>	Number of independent simulation draws used to calculate upper and lower bounds of coefficient estimates: lower values run faster; higher values produce smoother curves.
<code>xmin</code>	A numerical value indicating the minimum value shown of <code>x</code> shown in the graph. Rarely used.
<code>xmax</code>	A numerical value indicating the maximum value shown of <code>x</code> shown in the graph. Rarely used.
<code>ercolor</code>	A character value indicating the outline color of the whisker or ribbon.
<code>esize</code>	A numerical value indicating the size of the whisker or ribbon.
<code>ralpha</code>	A numerical value indicating the transparency of the ribbon.
<code>rfill</code>	A character value indicating the filling color of the ribbon.
<code>...</code>	Other <code>ggplot</code> aesthetics arguments for points in the dot-whisker plot or lines in the line-ribbon plots. Not currently used.

Details

`interplot.mlm` is a S3 method from the `interplot`. It works on mixed-effects objects with class `lmerMod` and `glmerMod`.

Because the output function is based on [ggplot](#), any additional arguments and layers supported by `ggplot2` can be added with the `+`.

Value

The function returns a ggplot object.

interplot.lmml	<i>Plot Conditional Coefficients in (Generalized) Linear Models with Imputed Data and Interaction Terms</i>
----------------	---

Description

interplot.mi is a method to calculate conditional coefficient estimates from the results of (generalized) linear regression models with interaction terms and multiply imputed data.

Usage

```
## S3 method for class 'lmml'
interplot(m, var1, var2, plot = TRUE, steps = NULL,
  ci = 0.95, hist = FALSE, var2_dt = NA, point = FALSE, sims = 5000,
  xmin = NA, xmax = NA, ercolor = NA, esize = 0.5, ralpha = 0.5,
  rfill = "grey70", ...)
```

Arguments

m	A model object including an interaction term, or, alternately, a data frame recording conditional coefficients.
var1	The name (as a string) of the variable of interest in the interaction term; its conditional coefficient estimates will be plotted.
var2	The name (as a string) of the other variable in the interaction term.
plot	A logical value indicating whether the output is a plot or a dataframe including the conditional coefficient estimates of var1, their upper and lower bounds, and the corresponding values of var2.
steps	Desired length of the sequence. A non-negative number, which for seq and seq.int will be rounded up if fractional. The default is 100 or the unique categories in the var2 (when it is less than 100. Also see unique).
ci	A numeric value defining the confidence intervals. The default value is 95% (0.95).
hist	A logical value indicating if there is a histogram of 'var2' added at the bottom of the conditional effect plot.
var2_dt	A numerical value indicating the frequency distribution of 'var2'. It is only used when 'hist == TRUE'. When the object is a model, the default is the distribution of 'var2' of the model.
point	A logical value determining the format of plot. By default, the function produces a line plot when var2 takes on ten or more distinct values and a point (dot-and-whisker) plot otherwise; option TRUE forces a point plot.

sims	Number of independent simulation draws used to calculate upper and lower bounds of coefficient estimates: lower values run faster; higher values produce smoother curves.
xmin	A numerical value indicating the minimum value shown of x shown in the graph. Rarely used.
xmax	A numerical value indicating the maximum value shown of x shown in the graph. Rarely used.
ercolor	A character value indicating the outline color of the whisker or ribbon.
esize	A numerical value indicating the size of the whisker or ribbon.
ralpha	A numerical value indicating the transparency of the ribbon.
rfill	A character value indicating the filling color of the ribbon.
...	Other ggplot aesthetics arguments for points in the dot-whisker plot or lines in the line-ribbon plots. Not currently used.

Details

interplot is a S3 method from the interplot. It can visualize the changes in the coefficient of one term in a two-way interaction conditioned by the other term. This function can work on interactions from results in the class of list.

Because the output function is based on [ggplot](#), any additional arguments and layers supported by [ggplot2](#) can be added with the +.

Value

The function returns a ggplot object.

interplot.mlmmi	<i>Plot Conditional Coefficients in Mixed-Effects Models with Imputed Data and Interaction Terms</i>
-----------------	--

Description

interplot.mlmmi is a method to calculate conditional coefficient estimates from the results of multilevel (mixed-effects) regression models with interaction terms and multiply imputed data.

Usage

```
## S3 method for class 'mlmmi'
interplot(m, var1, var2, plot = TRUE, steps = NULL,
  ci = 0.95, hist = FALSE, var2_dt = NA, point = FALSE, sims = 5000,
  xmin = NA, xmax = NA, ercolor = NA, esize = 0.5, ralpha = 0.5,
  rfill = "grey70", ...)
```


Arguments

<code>m</code>	A model object including an interaction term, or, alternately, a data frame recording conditional coefficients.
<code>var1</code>	The name (as a string) of the variable of interest in the interaction term; its conditional coefficient estimates will be plotted.
<code>var2</code>	The name (as a string) of the other variable in the interaction term.
<code>plot</code>	A logical value indicating whether the output is a plot or a dataframe including the conditional coefficient estimates of <code>var1</code> , their upper and lower bounds, and the corresponding values of <code>var2</code> .
<code>steps</code>	Desired length of the sequence. A non-negative number, which for <code>seq</code> and <code>seq.int</code> will be rounded up if fractional. The default is 100 or the unique categories in the <code>var2</code> (when it is less than 100. Also see unique).
<code>ci</code>	A numeric value defining the confidence intervals. The default value is 95% (0.95).
<code>hist</code>	A logical value indicating if there is a histogram of <code>'var2'</code> added at the bottom of the conditional effect plot.
<code>var2_dt</code>	A numerical value indicating the frequency distribution of <code>'var2'</code> . It is only used when <code>'hist == TRUE'</code> . When the object is a model, the default is the distribution of <code>'var2'</code> of the model.
<code>point</code>	A logical value determining the format of plot. By default, the function produces a line plot when <code>var2</code> takes on ten or more distinct values and a point (dot-and-whisker) plot otherwise; option <code>TRUE</code> forces a point plot.
<code>sims</code>	Number of independent simulation draws used to calculate upper and lower bounds of coefficient estimates: lower values run faster; higher values produce smoother curves.
<code>xmin</code>	A numerical value indicating the minimum value shown of <code>x</code> shown in the graph. Rarely used.
<code>xmax</code>	A numerical value indicating the maximum value shown of <code>x</code> shown in the graph. Rarely used.
<code>ercolor</code>	A character value indicating the outline color of the whisker or ribbon.
<code>esize</code>	A numerical value indicating the size of the whisker or ribbon.
<code>ralpha</code>	A numerical value indicating the transparency of the ribbon.
<code>rfill</code>	A character value indicating the filling color of the ribbon.
<code>...</code>	Other <code>ggplot</code> aesthetics arguments for points in the dot-whisker plot or lines in the line-ribbon plots. Not currently used.

Details

`interplot.mlmmi` is a S3 method from the `interplot`. It works on lists of mixed-effects objects with class `lmerMod` and `glmerMod` generated by `mitools` and `lme4`.

Because the output function is based on [ggplot](#), any additional arguments and layers supported by `ggplot2` can be added with the `+`.

Value

The function returns a ggplot object.

interplot.plot	<i>Plot Conditional Coefficients in Models with Interaction Terms</i>
----------------	---

Description

Graph based on the data frame of statistics about the conditional effect of an interaction.

Usage

```
## S3 method for class 'plot'
interplot(m, var1 = NULL, var2 = NULL, plot = TRUE,
  steps = NULL, ci = 0.95, hist = FALSE, var2_dt = NULL,
  point = FALSE, sims = 5000, xmin = NA, xmax = NA, ercolor = NA,
  esize = 0.5, ralpha = 0.5, rfill = "grey70", ...)
```

Arguments

m	A model object including an interaction term, or, alternately, a data frame recording conditional coefficients. This data frame should include four columns: <ul style="list-style-type: none"> • fake: The sequence of var1 (the item whose effect will be conditioned on in the interaction); • coef1: The point estimates of the coefficient of var1 at each break point. • ub: The upper bound of the simulated 95% CI. • lb: The lower bound of the simulated 95% CI.
var1	The name (as a string) of the variable of interest in the interaction term; its conditional coefficient estimates will be plotted.
var2	The name (as a string) of the other variable in the interaction term.
plot	A logical value indicating whether the output is a plot or a dataframe including the conditional coefficient estimates of var1, their upper and lower bounds, and the corresponding values of var2.
steps	Desired length of the sequence. A non-negative number, which for seq and seq.int will be rounded up if fractional. The default is 100 or the unique categories in the var2 (when it is less than 100. Also see unique).
ci	is a numeric value inherited from the data wrangling functions in this package. Adding it here is just for the method consistency.
hist	A logical value indicating if there is a histogram of 'var2' added at the bottom of the conditional effect plot.
var2_dt	A numerical value indicating the frequency distribution of 'var2'. It is only used when 'hist == TRUE'. When the object is a model, the default is the distribution of 'var2' of the model.

<code>point</code>	A logical value determining the format of plot. By default, the function produces a line plot when <code>var2</code> takes on ten or more distinct values and a point (dot-and-whisker) plot otherwise; option <code>TRUE</code> forces a point plot.
<code>sims</code>	Number of independent simulation draws used to calculate upper and lower bounds of coefficient estimates: lower values run faster; higher values produce smoother curves.
<code>xmin</code>	A numerical value indicating the minimum value shown of <code>x</code> shown in the graph. Rarely used.
<code>xmax</code>	A numerical value indicating the maximum value shown of <code>x</code> shown in the graph. Rarely used.
<code>ercolor</code>	A character value indicating the outline color of the whisker or ribbon.
<code>esize</code>	A numerical value indicating the size of the whisker or ribbon.
<code>ralpha</code>	A numerical value indicating the transparency of the ribbon.
<code>rfill</code>	A character value indicating the filling color of the ribbon.
<code>...</code>	Other <code>ggplot</code> aesthetics arguments for points in the dot-whisker plot or lines in the line-ribbon plots. Not currently used.

Details

`interplot.plot` is a S3 method from the `interplot`. It generates plots of conditional coefficients. Because the output function is based on `ggplot`, any additional arguments and layers supported by `ggplot2` can be added with the `+`.

Value

The function returns a `ggplot` object.

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