# Package 'pastaPlot'

June 5, 2024

**Type** Package

**Title** Spaghetti-Plot Fixed and Random Effects of Linear Mixed Models

**Version** 0.1.0

**Description** Plot both fixed and random effects of linear mixed models, multilevel models in a single spaghetti plot. The package allows to visualize the effect of a predictor on a criterion between different levels of a grouping variable. Additionally, confidence intervals can be displayed for fixed effects. Calculation of predicted values of random effects allows only models with one random intercept and/or one random slope to be plotted. Confidence intervals and predicted values of fixed effects are computed using the 'ggpredict' function from the 'ggeffects' package. Lüdecke, D. (2018) <doi:10.21105/joss.00638>.

**Encoding** UTF-8

**LazyData** true

**Imports** ggeffects, ggplot2, glmmTMB, lme4

**RoxygenNote** 7.3.1

**Depends** R (>= 2.10)

**License** MIT + file LICENSE

**NeedsCompilation** no

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**Repository** CRAN

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# Contents

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cookPasta                    *Spaghetti-plot fixed and random effects of linear mixed models*

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## Description

cookPasta() creates dataframes from fixed and random effects of 'lme4' or 'glmmTMB' models
(e.g., for plotting)

## Usage

```
cookPasta(
  model = NULL,
  predictor = NULL,
  nested.in = NULL,
  group = NULL,
  ci.int = FALSE,
  ci.lvl = ci.lvl
)
```

## Arguments

| | |
|---|---|
| model | lme4 or glmmTMB model object |
| predictor | (Character) Name of predictor (e.g., "time" or "math_score"), as it is present in the model |
| nested.in | (Character) Name of the variable your time points or subjects are nested in (e.g.,"school" or "id") |
| group | (Optional, character) The name of your grouping variable (e.g., "condition" or "gender") |
| ci.int | (Optional, boolean) Enable confidence (prediction) intervals, disabled by default |
| ci.lvl | (Optional, numeric) Set level of confidence (prediction) intervals (default: 0.95). Requires ci.int to be set to TRUE |

## Value

Returns a list of two dataframes, in which the first element is the fixed effects dataframe and the
second element the random effects dataframe

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| ecovia_data | *ECOVIA data* |
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## Description

A subset of data from the ECOVIA app

## Usage

```
ecovia_data
```

## Format

A data frame with 1743 rows and 4 columns:

**id** Subjects, in which time points are nested in

**time** Day of intervention

**condition** Condition (control vs. intervention)

**CO2** Daily dietary carbon emissions

## Source

<https://osf.io/qd7vw/?view_only=cc22e0d1de8844e1850d8ef1442fbecb>

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| jsp_data | *JSP data* |
|---|---|

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## Description

A subset of JSP secondary school exam data

## Usage

```
jsp_data
```

## Format

A data frame with 728 rows and 7 columns:

**math_score_y1** Score on math test year 1

**math_score_y3** Score on math test year 3

**gender** Gender of subjects (pupils)

**social_class** Social class of subjects (pupils)

**school** School, in which subjects (pupils) are nested in

**normal_score_y1** Normal test score year 1

**normal_score_y3** Normal test score year 3

## Source

<https://www.bristol.ac.uk/cmm/team/hg/msm-3rd-ed/datasets.html>

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pastaPlot                    *Spaghetti-plot fixed and random effects of linear mixed models*

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## Description

pastaPlot() plots slopes for both fixed and random effects of linear mixed models from 'lme4' or 'glmmTMB' packages as a single spaghetti plot, optionally between conditions including confidence bands for fixed effects.

## Usage

```
pastaPlot(
  model = NULL,
  predictor = NULL,
  nested.in = NULL,
  group = NULL,
  legend.title = "Legend",
  group.labels = NULL,
  xlab = NULL,
  ylab = NULL,
  font.family = NULL,
  colors = NULL,
  ci.lvl = 0.95,
  ci.int = FALSE,
  ci.linetype = 0,
  lwd.fix = 1,
  lwd.ran = 0.5,
  xlab.inc = 0,
  xlab.int = NULL,
  ylim = NULL,
  opacity.ci = 0.25,
  opacity.ran = 0.3,
  colors.ci = NULL
)
```

## Arguments

| | |
|---|---|
| model | lme4 or glmmTMB model object |
| predictor | (Character) Name of predictor (e.g., "time" or "math_score"), as it is present in the model |
| nested.in | (Character) Name of the variable your time points or subjects are nested in (e.g.,"school" or "id") |

| | |
|---|---|
| group | (Optional, character) The name of your grouping variable (e.g., "condition" or "gender") |
| legend.title | (Optional, character) Name of legend in plot (e.g., "Condition", or "Gender") |
| group.labels | (Optional, vector of characters) Names of group labels to be displayed in the plot (e.g., c("Control", "Intervention")) |
| xlab | (Optional, character) Label of x-axis (predictor) (e.g., "Time (days)") |
| ylab | (Optional, character) Label of y-axis (dependant variable) (e.g., "GAF") |
| font.family | (Optional, character) Name of the font family (e.g. "serif") |
| colors | (Optional, vector of characters) Set color of slopes. Length of vector should correspond to number of values in group variable (e.g., c("#5e9aff", "blue")). If no group variable is specified, pass a single color. |
| ci.lvl | (Optional, numeric) Set confidence interval (default: 0.95) |
| ci.int | (Optional, logical) Enable confidence (prediction) intervals, disabled by default |
| ci.linetype | (Optional, numeric) Set linetype of confidence bands outline (default: 0) |
| lwd.fix | (Optional, numeric) Line width of fixed effects (default: 1) |
| lwd.ran | (Optional, numeric) Line width of random effects (default: 0.5) |
| xlab.inc | (Optional, numeric) Increment the displayed values of your predictor (e.g., xlab_int = 1 changes range of x from 0-29 to 1-30), set to 0 by default |
| xlab.int | (Optional, numeric) Interval between displayed predictor values on x-axis (e.g., "1"), disabled by default |
| ylim | (Optional, numeric vector) Limited range of values on y-axis (e.g. c(1,5.5)) |
| opacity.ci | (Optional, numeric) Set opacity of confidence bands in the range of 0 to 1 (default = 0.1) |
| opacity.ran | (Optional, numeric) Set opacity of random slopes in the range of 0 to 1 (default = 0.4) |
| colors.ci | (Optional, vector of characters) Set color of confidence bands. Length of vector should correspond to number of values in group variable (e.g., c("#5e9aff", "blue")). If no group variable is specified, pass a single color. |

### Value

Returns a ggplot2 plot object to further be modified

### Examples

```
lme4_model <- lme4::lmer(CO2 ~ 1 + time*condition + (1 + time | id),
data=ecovia_data, REML = FALSE, control = lme4::lmerControl(optimizer = "bobyqa"))
pastaPlot(lme4_model, "time", "id", group = "condition", legend.title = "Condition",
group.labels = c("Control", "Intervention"), ci.int = TRUE, xlab = "Time (days)",
ylab = "CO2")

glmmTMB_model <- glmmTMB::glmmTMB(math_score_y3 ~ 1 + math_score_y1*gender +
(1 + math_score_y1 | school), data=jsp_data, REML = FALSE)
pastaPlot(glmmTMB_model, "math_score_y1", "school", group = "gender",
legend.title = "Gender", group.labels = c("Male", "Female"), ci.int = FALSE,
xlab = "Math score (year 1)", ylab = "Math score (year 3)")
```

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