Introduction

`pmplots` is an `R` package to generate exploratory and diagnostic plots commonly of interest in pharamcometrics. Each function in `pmplots` is named according to the specific plot it generates via calls to functions in the `ggplot2` `R` package.

This document lists the functional requirements for the `pmplots` package.

Requirements for pharamcometric plotting package `pmplots`

Section	RID	Requirement
Default column names	1	Column `RES` refers to residual; rendered `res` in function names
	2	Column `WRES` weighted residual; rendered `wres` in function names
	3	Column `CWRES` refers to conditional weighted residual; rendered `cwres` in function names
	4	Column `TIME` refers to model time; rendered `time` in function names
	5	Column `TAFD` refers to time after first dose; rendered `tafd` in function names
	6	Column `TAD` refers to time after dose; rendered `tad` in function names
	7	Column `DV` refers to observed data; rendered `dv` in function names
	8	Column `PRED` refers to population level predictions; rendered `pred` in function names
	9	Column `IPRED` refers to individual level predictions; rendered `ipred` in function names
Plots generated	10	Functions `dv_time`, `dv_tafd`, and `dv_tad` plot `DV` versus the appropriate time measure; both lines and points are plotted
	11	Functions `dv_pred` and `dv_ipred` plot `DV` versus the appropriate predicted value; a line of identity is added as well as a loess smothing line; both the x- and y-axis maybe be transformed to log scale with the `loglog` argument; if `loglog` is used, only positive values are retained for the plot
	12	Functions `res_time`, `res_tafd`, and `res_tad` plots residual versus the appropriate time measure; a reference line is added at `res=0` as well as a loess smoothing line
	13	Functions `wres_time`, `wres_tafd`, and `wres_tad` plots weighted residual versus the appropriate time measure; a reference line is added at `wres=0` as well as a loess smoothing line
	14	Functions `cwres_time`, `cwres_tafd`, and `cwres_tad` plots conditional weighted residual versus the appropriate time measure; a reference line is added at `cwres=0` as well as a loess smoothing line

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	15	Functions `res_pred`, `wres_pred` and `cwres_pred` plot the appropriate residual versus population model predictions (`PRED`); a horizontal reference line is added at `c/w/res=0` as well as a loess smoothing line
	16	Functions `res_cont`, `wres_cont`, and `cwres_cont` plot the appropriate residual versus a continuous covariate in the data set; a horizontal reference line is added at `c/w/res=0` as well as a loess smoothing line
	17	Functions `res_cat`, `wres_cat`, and `cwres_cat` makes a boxplot of the appropriate residual versus a categorical data set column
	18	Function `wres_q` and `cwres_q` generates quantile-quantile plots of the appropriate residual value; a refereince identity line is added
	19	Function `eta_hist` generates histograms of model ETAs and returns a list `gg/ggplot` objects
	20	Function `eta_cont` generates a scatterplot of model ETAs versus a continuous variable in the data set; a horizontal reference line at `ETAn=0` and loess smoothing line are also added to the plot
	21	Function `eta_cat` generates boxplot summaries of model ETAs by a categorical variable in the data set
	22	Function `eta_pairs` generates pairs plots using the `ggpairs` function from the `GGally` package
	23	Function `splitplot` splits the input data set according to a discrete data item and generates a plot according to a user-named function, returning a list of `gg/ggplot` objects
Continuous scatter	24	x-axis options availabe in `x_scale_continuous` can be modified by the xs argument
	25	y-axis options available in `y_scale_continuous` can be modified by the ys argument
	26	When loess smoothing lines are generated, `geom_smooth` with `ggplot2` default behavior is used; the smooth may be modified through the `smooth` argument
	27	A title may be added through the `title` argument
Boxplot summaries	28	x-axis options availabe in `x_scale_discrete` can be modified by the xs argument
	29	y-axis options available in `y_scale_continuous` can be modified by the ys argument
	30	Boxplot summaries are generated using `geom_boxplot` with `ggplot2` default configuration
	31	A title may be added thought the `title` argument
Input data	32	Data are input as data.frame or tibble
	33	Data sets are expected to be filter prior to plotting, so that the input data frame only contains rows that are appropriate for the current plotting function
	34	For continuous scatter plots, numeric data are required or an error is generated; data are considered discrete if they are `numeric` or `integer`

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	35	For boxplot summaries, discrete data are required for x-axis for boxplot summaries; data are considered discrete of they are `character`, `factor`, or `logical`
R packages	36	Imports: `dplyr (>= 0.7.2)`, `rlang (>= 0.1.2)`
	37	Depends: `ggplot2 (>= 2.2.1)`
	38	Suggests: `testthat`