

Package ‘ggstatsplot’

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Type Package

Title 'ggplot2' Based Plots with Statistical Details

Version 0.0.3

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Description Extension of 'ggplot2', 'ggstatsplot' creates graphics with details from statistical tests (parametric, non-parametric, or robust) included in the plots themselves. It is targeted primarily at behavioral sciences community to provide a one-line code to generate information-rich plots for statistical analysis of continuous (violin plots, scatterplots, histograms) or categorical (pie charts) data.

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URL <https://indrajeetpatil.github.io/ggstatsplot/>

BugReports <https://github.com/IndrajeetPatil/ggstatsplot/issues>

Depends R (>= 3.3.0), datasets, grDevices, stats

Imports broom (>= 0.4.4), coin (>= 1.2-2), cowplot (>= 0.9.2), crayon (>= 1.3.4), DescTools (>= 0.99.23), dplyr (>= 0.7.4), effsize (>= 0.7.1), ggcorrplot (>= 0.1.1), ggExtra (>= 0.8), ggplot2 (>= 2.2.1), ggrepel (>= 0.7.0), glue (>= 1.2.0), grid, gtable (>= 0.2.0), jmv (>= 0.8.6.2), magrittr (>= 1.5), MASS (>= 7.3-49), nortest (>= 1.0-4), purrr (>= 0.2.4), rlang (>= 0.2.0), scales (>= 0.5.0), sfsmisc (>= 1.1-1), sjstats (>= 0.14.2-3), tibble (>= 1.4.2), tidyr (>= 0.8.0), WRS2 (>= 0.9-2)

Suggests ggplot2movies, gapminder (>= 0.3.0), knitr, rmarkdown

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ggstatsplot-package ggstatsplot

Description

Collection of functions to enhance ggplot2 plots with results from statistical tests.

Details

The main functions are-

- [ggbetweenstats](#) function to produce information-rich comparison plot between different groups or conditions with ggplot2 and details from the statistical tests in the subtitle
- [ggscatterstats](#) function to produce ggplot2 scatterplots along with a marginal histograms/boxplots/density plots from ggExtra and details from the statistical tests in the subtitle
- [ggpiestats](#) function to produce pie chart with details from the statistical tests in the subtitle
- [gghistostats](#) function to produce histogram for a single variable with results from one sample test displayed in the subtitle
- [ggcorrmat](#) function to visualize correlation matrix
- [combine_plots](#) helper function to combine multiple ggstatsplot plots using `cowplot::plot_grid()` with a combination of title, caption, and annotation label
- [theme_mprl](#) default theme used for this package
- [specify_decimal_p](#) helper function to format results for pretty printing

For more documentation, see [README](#) on GitHub. Vignette preparation in progress.

combine_plots	<i>Combining multiple plots using <code>cowplot::plot_grid()</code> with a combination of title, caption, and annotation label</i>
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Description

Wrapper around `plot_grid` that will return a plotgrid along with a combination of title, caption, and annotation label

Usage

```
combine_plots(..., title.text = NULL, title.color = "black",
  title.size = 16, title.vjust = 0.5, title.hjust = 0.5,
  title.fontface = "bold", caption.text = NULL, caption.color = "black",
  caption.size = 10, caption.vjust = 0.5, caption.hjust = 0.5,
  caption.fontface = "plain", sub.text = NULL, sub.color = "black",
  sub.size = 14, sub.vjust = 0.5, sub.hjust = 0.5,
  sub.fontface = "plain", sub.x = 0.5, sub.y = 0.5,
  sub.vpadding = grid::unit(1, "lines"), sub.angle = 0,
  sub.lineheight = 0.9, title.rel.heights = c(0.1, 1.2),
  caption.rel.heights = c(1.2, 0.1), title.caption.rel.heights = c(0.1, 1.2,
  0.1))
```

Arguments

<code>...</code>	Additional arguments used in the function <code>cowplot::plot_grid()</code> .
<code>title.text</code>	String or plotmath expression to be drawn as title for the <i>combined plot</i> .
<code>title.color</code>	Text color for title.
<code>title.size</code>	Point size of title text.
<code>title.vjust</code>	Vertical justification for title. Default = 0.5 (centered on y). 0 = baseline at y, 1 = ascender at y.
<code>title.hjust</code>	Horizontal justification for title. Default = 0.5 (centered on x). 0 = flush-left at x, 1 = flush-right.
<code>title.fontface</code>	The font face ("plain", "bold", etc.) for title.
<code>caption.text</code>	String or plotmath expression to be drawn as the caption for the <i>combined plot</i> .
<code>caption.color</code>	Text color for caption.
<code>caption.size</code>	Point size of title text.
<code>caption.vjust</code>	Vertical justification for caption. Default = 0.5 (centered on y). 0 = baseline at y, 1 = ascender at y.
<code>caption.hjust</code>	Horizontal justification for caption. Default = 0.5 (centered on x). 0 = flush-left at x, 1 = flush-right.
<code>caption.fontface</code>	The font face ("plain", "bold", "italic", "bold.italic") for caption.

sub.text	The label with which the <i>combined plot</i> should be annotated. Can be a plotmath expression.
sub.color	Text color for annotation label.
sub.size	Point size of annotation text.
sub.vjust	Vertical justification for annotation label.
sub.hjust	Horizontal justification for annotation label.
sub.fontface	The font face ("plain", "bold", "italic", "bold.italic") for the annotation label.
sub.x	The x position of annotation label.
sub.y	The y position of annotation label.
sub.vpadding	Vertical padding. The total vertical space added to the label, given in grid units. By default, this is added equally above and below the label. However, by changing the y and vjust parameters, this can be changed.
sub.angle	Angle at which annotation label is to be drawn.
sub.lineheight	Line height of annotation label.
title.rel.heights	Numerical vector of relative columns heights while combining (title, plot).
caption.rel.heights	Numerical vector of relative columns heights while combining (plot, caption).
title.caption.rel.heights	Numerical vector of relative columns heights while combining (title, plot, caption).

Value

Combined plot with title and/or caption and/or annotation label

Author(s)

Indrajeet Patil

Examples

```
# loading the necessary libraries
library(ggplot2)

# preparing the first plot
p1 <-
  ggplot2::ggplot(data = subset(iris, iris$Species == "setosa"),
                 aes(x = Sepal.Length, y = Sepal.Width)) +
  geom_point() +
  labs(title = "setosa")

# preparing the second plot
p2 <-
  ggplot2::ggplot(data = subset(iris, iris$Species == "versicolor"),
```

```

      aes(x = Sepal.Length, y = Sepal.Width)) +
      geom_point() +
labs(title = "versicolor")

# combining the plot with a title and a caption
combine_plots(
  p1,
  p2,
  labels = c("(a)", "(b)"),
  title.text = "Dataset: Iris Flower dataset",
  caption.text = "Note: Only two species of flower are displayed",
  title.color = "red",
  caption.color = "blue"
)

```

ggbetweenstats

violin plots for group or condition comparisons

Description

A combination of box and violin plots along with jittered data points for between-subjects designs with statistical details included in the plot as a subtitle.

Usage

```

ggbetweenstats(data = NULL, x, y, plot.type = "boxviolin",
  type = "parametric", effsize.type = "unbiased", xlab = NULL,
  ylab = NULL, caption = NULL, title = NULL, k = 3, var.equal = FALSE,
  nboot = 100, notch = FALSE, notchwidth = 0.5, linetype = "solid",
  outlier.tagging = NULL, outlier.label = NULL,
  outlier.label.color = "black", outlier.color = "black",
  outlier.coef = 1.5, mean.plotting = TRUE, mean.size = 5,
  mean.color = "darkred", messages = TRUE)

```

Arguments

data	Dataframe from which variables specified are preferentially to be taken.
x	The grouping variable.
y	The response - a vector of length the number of rows of x.
plot.type	Character describing the <i>type</i> of plot. Currently supported plots are "box" (for pure boxplots), "violin" (for pure violin plots), and "boxviolin" (for a mix of box and violin plots; default).
type	Type of statistic expected ("parametric" or "nonparametric" or "robust").Corresponding abbreviations are also accepted: "p" (for parametric), "np" (nonparametric), "r" (robust), resp.

<code>effsize.type</code>	Type of effect size needed for <i>parametric</i> tests ("biased" (Cohen's <i>d</i> for t-test ; partial eta-squared for anova) or "unbiased" (Hedge's <i>g</i> for t-test ; partial omega-squared for anova)).
<code>xlab</code>	Label for x axis variable.
<code>ylab</code>	Label for y axis variable.
<code>caption</code>	The text for the plot caption.
<code>title</code>	The text for the plot title.
<code>k</code>	Number of decimal places expected for results.
<code>var.equal</code>	A logical variable indicating whether to treat the two variances as being equal (Default: FALSE).
<code>nboot</code>	Number of bootstrap samples for computing effect size (Default: 100).
<code>notch</code>	A logical. If FALSE (default), a standard box plot will be displayed. If TRUE, a notched box plot will be used. Notches are used to compare groups; if the notches of two boxes do not overlap, this suggests that the medians are significantly different. In a notched box plot, the notches extend $1.58 * IQR / \sqrt{n}$. This gives a roughly 95 interval for comparing medians. IQR: Inter-Quartile Range.
<code>notchwidth</code>	For a notched box plot, width of the notch relative to the body (default 0.5).
<code>linetype</code>	Character strings ("blank", "solid", "dashed", "dotted", "dotdash", "longdash", and "twodash") specifying the type of line to draw box plots (Default: "solid"). Alternatively, the numbers 0 to 6 can be used (0 for "blank", 1 for "solid", etc.).
<code>outlier.tagging</code>	Decides whether outliers should be tagged (Default: FALSE).
<code>outlier.label</code>	Label to put on the outliers that have been tagged.
<code>outlier.label.color</code>	Color for the label to to put on the outliers that have been tagged (Default: "black").
<code>outlier.color</code>	Default aesthetics for outliers (Default: "black").
<code>outlier.coef</code>	Coefficient for outlier detection using Tukey's method. With Tukey's method, outliers are below (1st Quartile) or above (3rd Quartile) <code>outlier.coef</code> times the Inter-Quartile Range (IQR) (Default: 1.5).
<code>mean.plotting</code>	Decides whether mean is to be highlighted and its value to be displayed (Default: TRUE).
<code>mean.size</code>	Point size for the data point corresponding to mean (Default: 5).
<code>mean.color</code>	Color for the data point corresponding to mean (Default: "darkred").
<code>messages</code>	Decides whether messages references, notes, and warnings are to be displayed (Default: TRUE).

Author(s)

Indrajeet Patil

See Also[grouped_ggbetweenstats](#)**Examples**

```
# to get reproducible results from bootstrapping
set.seed(123)

# simple function call with the defaults
ggstatsplot::ggbetweenstats(
  data = datasets::iris,
  x = Species,
  y = Sepal.Length
)

# more detailed function call
ggstatsplot::ggbetweenstats(
  data = datasets::ToothGrowth,
  x = supp,
  y = len,
  plot.type = "box",
  xlab = "Supplement type",
  ylab = "Tooth length")
```

ggcorrmat

Visualization of a correlalogram (or correlation matrix) using 'ggplot2'/'ggcorrplot'

Description

Visualization of a correlalogram (or correlation matrix) using 'ggplot2'/'ggcorrplot'

Usage

```
ggcorrmat(data, cor.vars, cor.vars.names = NULL, output = "plot",
  type = "full", method = "square", corr.method = "pearson",
  exact = FALSE, continuity = TRUE, beta = 0.2, digits = 2,
  sig.level = 0.05, hc.order = FALSE, hc.method = "complete",
  lab = TRUE, colors = c("#E69F00", "white", "#009E73"),
  outline.color = "black", ggtheme = ggplot2::theme_gray,
  ggstatsplot.theme = TRUE, title = NULL, subtitle = NULL,
  caption = NULL, caption.default = TRUE, lab.col = "black",
  lab.size = 5, insig = "pch", pch = 4, pch.col = "black",
  pch.cex = 11, tl.cex = 12, tl.col = "black", tl.srt = 45,
  axis.text.x.margin.t = 0, axis.text.x.margin.r = 0,
  axis.text.x.margin.b = 0, axis.text.x.margin.l = 0,
```

```
legend.title.margin = TRUE, t.margin = unit(0, "mm"), b.margin = unit(3,
"mm"), messages = TRUE)
```

Arguments

<code>data</code>	Dataframe from which variables specified are preferentially to be taken.
<code>cor.vars</code>	List of variables for which the correlation matrix is to be computed and visualized.
<code>cor.vars.names</code>	Optional list of names to be used for <code>cor.vars</code> . The names should be entered in the same order.
<code>output</code>	Expected output from this function: "plot" (visualization matrix) or "correlations" (correlation matrix) or "p-values" (matrix of p-values).
<code>type</code>	Character, "full" (default), "upper" or "lower", display full matrix, lower triangular or upper triangular matrix.
<code>method</code>	Character argument that decides the visualization method of correlation matrix to be used. Allowed values are "square" (default), "circle"
<code>corr.method</code>	A character string indicating which correlation coefficient is to be computed ("pearson" (default) or "kendall" or "spearman"). "robust" can also be entered but only if output argument is set to either "correlations" or "p-values". The robust correlation used is percentage bend correlation (see <code>?WRS2::pball</code>). Abbreviations will not work.
<code>exact</code>	A logical indicating whether an exact p -value should be computed. Used for Kendall's τ and Spearman's ρ . For more details, see <code>?stats::cor.test</code> .
<code>continuity</code>	A logical. If TRUE, a continuity correction is used for Kendall's τ and Spearman's ρ when not computed exactly (Default: TRUE).
<code>beta</code>	A numeric bending constant for robust correlation coefficient (Default: 0.2).
<code>digits</code>	Decides the number of decimal digits to be added into the plot (Default: 2).
<code>sig.level</code>	Significance level (Default: 0.05). If the p-value in p-mat (p-value matrix) is bigger than <code>sig.level</code> , then the corresponding correlation coefficient is regarded as insignificant.
<code>hc.order</code>	Logical value. If TRUE, correlation matrix will be hc.ordered using <code>hclust</code> function (Default is FALSE).
<code>hc.method</code>	The agglomeration method to be used in <code>hclust</code> (see <code>?hclust</code>).
<code>lab</code>	Logical value. If TRUE, correlation coefficient values will be displayed in the plot.
<code>colors</code>	A vector of 3 colors for low, mid, and high correlation values.
<code>outline.color</code>	The outline color of square or circle. Default value is "gray".
<code>ggtheme</code>	A function, ggplot2 theme name. Default value is <code>ggplot2::theme_gray</code> . Allowed values are the official ggplot2 themes, including <code>theme_bw</code> , <code>theme_minimal</code> , <code>theme_classic</code> , <code>theme_void</code> , etc.
<code>ggstatsplot.theme</code>	A logical. Decides whether default theme for <code>ggstatsplot</code> , which is <code>theme_mpr1</code> , is to be overlaid on the entered theme (Default: <code>ggstatsplot.theme = TRUE</code>).

<code>title</code>	The text for the plot title.
<code>subtitle</code>	The text for the plot subtitle.
<code>caption</code>	The text for the plot caption. If not specified (if it is NULL, i.e.), a default caption will be shown.
<code>caption.default</code>	Logical decides whether the default caption should be shown.
<code>lab.col</code>	Color to be used for the correlation coefficient labels (applicable only when <code>lab = TRUE</code>).
<code>lab.size</code>	Size to be used for the correlation coefficient labels (applicable only when <code>lab = TRUE</code>).
<code>insig</code>	Character used to show specialized insignificant correlation coefficients ("pch" (default) or "blank"). If "blank", the corresponding glyphs will be removed; if "pch" is used, characters (see <code>?pch</code> for details) will be added on the corresponding glyphs.
<code>pch</code>	Decides the glyphs (read point shapes) to be used for insignificant correlation coefficients (only valid when <code>insig = "pch"</code>). Default value is <code>pch = 4</code> .
<code>pch.col, pch.cex</code>	The color and the cex (size) of pch (only valid when <code>insig = "pch"</code>). Defaults are <code>pch.col = "#F0E442"</code> and <code>pch.cex = 10</code> .
<code>tl.cex, tl.col, tl.srt</code>	The size, the color, and the string rotation of text label (variable names, i.e.).
<code>axis.text.x.margin.t, axis.text.x.margin.r, axis.text.x.margin.b, axis.text.x.margin.l</code>	Margins between x-axis and the variable name texts (t: top, r: right, b: bottom, l:left), especially useful in case the names are slanted, i.e. when the <code>tl.srt</code> is between 45 and 75 (Defaults: 0, 0, 0, 0, resp.).
<code>legend.title.margin</code>	Logical indicating whether to adjust the margin between legend title and the colorbar (Default: TRUE).
<code>t.margin, b.margin</code>	Margins in grid units. For more details, see <code>?grid::unit()</code> .
<code>messages</code>	Decides whether messages references, notes, and warnings are to be displayed (Default: TRUE).

Value

Correlation matrix plot or correlation coefficient matrix or matrix of p-values.

Note

If you are using R Notebook or Markdown and see a blank image being inserted when a chunk is executed, this behavior can be turned off by setting `legend.title.margin = FALSE`.

Author(s)

Indrajeet Patil

See Also

[grouped_ggcorrmat](#) [ggscatterstats](#) [grouped_ggscatterstats](#)

Examples

```
# to get the correlalogram
ggstatsplot::ggcorrmat(
  data = datasets::iris,
  cor.vars = c(Sepal.Length:Petal.Width)
)

# to get the correlation matrix
ggstatsplot::ggcorrmat(
  data = datasets::iris,
  cor.vars = c(Sepal.Length:Petal.Width),
  output = "correlations"
)

# setting output = "p-values" will return the p-value matrix

# modifying few elements of the correlation matrix by changing function defaults
ggstatsplot::ggcorrmat(
  data = datasets::iris,
  cor.vars = c(Sepal.Length, Sepal.Width, Petal.Length, Petal.Width),
  sig.level = 0.01,
  ggtheme = ggplot2::theme_gray,
  hc.order = TRUE, type = "lower", outline.col = "white",
  title = "Dataset: Iris"
)
```

gghistostats

Histogram for distribution of a numeric variable

Description

Histogram with statistical details from one-sample test included in the plot as a subtitle.

Usage

```
gghistostats(data = NULL, x, binwidth = NULL, bar.measure = "count",
  xlab = NULL, title = NULL, subtitle = NULL, caption = NULL,
  type = "parametric", test.value = 0, bf.prior = 0.707,
  bf.message = TRUE, k = 3, low.color = "#0072B2",
  high.color = "#D55E00", results.subtitle = TRUE,
  legend.title.margin = TRUE, t.margin = unit(0, "mm"), b.margin = unit(3,
  "mm"), centrality.para = NULL, centrality.color = "blue",
  centrality.size = 1.2, centrality.linetype = "dashed",
```

```
test.value.line = FALSE, test.value.color = "black",
test.value.size = 1.2, test.value.linetype = "dashed",
line.labeller = FALSE, line.labeller.y = -2, messages = TRUE)
```

Arguments

<code>data</code>	Dataframe from which variables specified are preferentially to be taken.
<code>x</code>	A numeric variable.
<code>binwidth</code>	The width of the bins. Can be specified as a numeric value, or a function that calculates width from <code>x</code> . The default is to use bins bins that cover the range of the data. You should always override this value, exploring multiple widths to find the best to illustrate the stories in your data.
<code>bar.measure</code>	Character describing what value needs to be represented as height in the bar chart. This can either be "count", which shows number of points in bin, or "density", which density of points in bin, scaled to integrate to 1, or "proportion", which shows relative frequencies of observations in each bin.
<code>xlab</code>	Label for x axis variable.
<code>title</code>	The text for the plot title.
<code>subtitle</code>	The text for the plot subtitle <i>if</i> you don't want results from one sample test to be displayed.
<code>caption</code>	The text for the plot caption.
<code>type</code>	Type of statistic expected ("parametric" or "nonparametric" or "bayes"). Abbreviations accepted are "p" or "np" or "bf", respectively.
<code>test.value</code>	A number specifying the value of the null hypothesis.
<code>bf.prior</code>	A number between 0.5 and 2 (default 0.707), the prior width to use in calculating Bayes factors.
<code>bf.message</code>	Logical. Decides whether to display Bayes Factor in favor of null hypothesis for parametric test if the null hypothesis can't be rejected (Default: <code>bf.message = TRUE</code>).
<code>k</code>	Number of decimal places expected for results.
<code>low.color, high.color</code>	Colors for low and high ends of the gradient. Defaults are colorblind-friendly.
<code>results.subtitle</code>	Decides whether the results of statistical tests are to be displayed as subtitle (Default: <code>results.subtitle = TRUE</code>). If set to <code>FALSE</code> , no statistical tests will be run.
<code>legend.title.margin</code>	Adjusting the margin between legend title and the colorbar.
<code>t.margin, b.margin</code>	Margins in grid units. For more details, see <code>?grid::unit()</code> .
<code>centrality.para</code>	Decides <i>which</i> measure of central tendency ("mean" or "median") is to be displayed as a vertical line.
<code>centrality.color</code>	Decides color for the vertical line for centrality parameter (Default: "blue").

<code>centrality.size</code>	Decides size for the vertical line for centrality parameter (Default: 1.2).
<code>centrality.linetype</code>	Decides linetype for the vertical line for centrality parameter (Default: "dashed").
<code>test.value.line</code>	Decides whether test value is to be displayed as a vertical line (Default: FALSE).
<code>test.value.color</code>	Decides color for the vertical line denoting test value (Default: "black").
<code>test.value.size</code>	Decides size for the vertical line for test value (Default: 1.2).
<code>test.value.linetype</code>	Decides linetype for the vertical line for test value (Default: "dashed").
<code>line.labeller</code>	A logical that decides whether line labels should be displayed (Default: FALSE).
<code>line.labeller.y</code>	A numeric denoting the y-coordinate for displaying line labels (Default: -2).
<code>messages</code>	Decides whether messages references, notes, and warnings are to be displayed (Default: TRUE).

Note

If you are using R Notebook and see a blank image being inserted when a chunk is executed, this behavior can be turned off by setting `legend.title.margin = FALSE`.

Author(s)

Indrajeet Patil

See Also

[grouped_gghistostats](#)

Examples

```
# most basic function call with the defaults
ggstatsplot::gghistostats(
  data = datasets::ToothGrowth,
  x = len,
  xlab = "Tooth length")

# another example
ggstatsplot::gghistostats(
  data = NULL,
  x = stats::rnorm(n = 1000, mean = 0, sd = 1),
  centrality.para = "mean",
  type = "np"
)

# more detailed function call
```

```
ggstatsplot::gghistostats(
  data = datasets::iris,
  x = Sepal.Length,
  type = "bf",
  bf.prior = 0.8,
  test.value = 3,
  centrality.para = "mean",
  test.value.line = TRUE,
  binwidth = 0.10
)
```

ggpiestats

Pie charts with statistical tests

Description

Pie charts for categorical data with statistical details included in the plot as a subtitle.

Usage

```
ggpiestats(data = NULL, main, condition = NULL, factor.levels = NULL,
  stat.title = NULL, title = NULL, caption = NULL, legend.title = NULL,
  facet.wrap.name = NULL, k = 3, facet.proptest = TRUE, messages = TRUE)
```

Arguments

data	The data as a data frame.
main	A string naming the variable to use as the rows in the contingency table.
condition	A string naming the variable to use as the columns in the contingency table.
factor.levels	A character vector with labels for factor levels of main variable.
stat.title	Title for the effect being investigated with the chi-square test.
title	The text for the plot title.
caption	The text for the plot caption.
legend.title	Title of legend.
facet.wrap.name	The text for the facet_wrap variable label.
k	Number of decimal places expected for results.
facet.proptest	Decides whether proportion test for main variable is to be carried out for each level of condition (Default: TRUE).
messages	Decides whether messages references, notes, and warnings are to be displayed (Default: TRUE).

Author(s)

Indrajeet Patil

Examples

```
library(ggplot2)

# simple function call with the defaults
ggstatsplot::ggpiestats(
  data = datasets::iris,
  main = Species
)

# more detailed function call
ggstatsplot::ggpiestats(
  data = datasets::mtcars,
  main = am,
  condition = cyl,
  factor.levels = c("zero", "one"),
  stat.title = "interaction",
  title = "Dataset: mtcars",
  caption = "This is a demo",
  legend.title = "transmission",
  facet.wrap.name = "No. of cylinders",
  facet.proptest = TRUE
)
```

 ggscatterstats

Scatterplot with marginal distributions

Description

Scatterplots from ggplot2 combined with marginal histograms/boxplots/density plots with statistical details added as a subtitle.

Usage

```
ggscatterstats(data = NULL, x, y, xlab = NULL, ylab = NULL,
  line.size = 1.5, line.color = "blue", marginal = TRUE,
  marginal.type = "histogram", marginal.size = 5, margins = c("both", "x",
  "y"), width.jitter = NULL, height.jitter = NULL, xfill = "#009E73",
  yfill = "#D55E00", centrality.para = NULL, type = "pearson",
  results.subtitle = NULL, title = NULL, caption = NULL, maxit = 500,
  k = 3, axes.range.restrict = FALSE, messages = TRUE)
```

Arguments

data	Dataframe from which variables specified are preferentially to be taken.
x	A vector containing the explanatory variable.
y	The response - a vector of length the number of rows of x.

<code>xlab</code>	Label for x axis variable.
<code>ylab</code>	Label for y axis variable.
<code>line.size</code>	Size for the regression line.
<code>line.color</code>	color for the regression line.
<code>marginal</code>	Decides whether <code>ggExtra::ggMarginal()</code> plots will be displayed; the default is TRUE.
<code>marginal.type</code>	Type of marginal distribution to be plotted on the axes ("histogram", "boxplot", "density", "violin").
<code>marginal.size</code>	Integer describing the relative size of the marginal plots compared to the main plot. A size of 5 means that the main plot is 5x wider and 5x taller than the marginal plots.
<code>margins</code>	Character describing along which margins to show the plots. Any of the following arguments are accepted: "both", "x", "y".
<code>width.jitter</code>	Degree of jitter in x direction. Defaults to 40% of the resolution of the data.
<code>height.jitter</code>	Degree of jitter in y direction. Defaults to 40% of the resolution of the data.
<code>xfill</code>	color fill for x axis distribution (default: "#009E73").
<code>yfill</code>	color fill for y axis distribution (default: "#D55E00").
<code>centrality.para</code>	Decides <i>which</i> measure of central tendency ("mean" or "median") is to be displayed as vertical (for x) and horizontal (for y) lines.
<code>type</code>	Type of association between paired samples required ("parametric": Pearson's product moment correlation coefficient" or "nonparametric": Spearman's rho" or "robust": Robust regression using an M estimator"). Corresponding abbreviations are also accepted: "p" (for parametric/pearson's), "np" (nonparametric/spearman), "r" (robust), resp.
<code>results.subtitle</code>	Decides whether the results of statistical tests are to be displayed as subtitle.
<code>title</code>	The text for the plot title.
<code>caption</code>	The text for the plot caption.
<code>maxit</code>	Maximum number of iterations for robust linear regression or bootstrap samples to compute Spearman's rho confidence intervals (Default: 500).
<code>k</code>	Number of decimal places expected for results.
<code>axes.range.restrict</code>	Logical decides whether to restrict the axes values ranges to min and max values of the x and y variables (Default: FALSE).
<code>messages</code>	Decides whether messages references, notes, and warnings are to be displayed (Default: TRUE).

Author(s)

Indrajeet Patil

See Also

[grouped_ggscatterstats](#) [ggcorrmat](#) [grouped_ggcorrmat](#)

Examples

```
# to get reproducible results from bootstrapping
set.seed(123)

# simple function call with the defaults
ggstatsplot::ggscatterstats(
  data = datasets::mtcars,
  x = wt,
  y = mpg
)

# more detailed function call
ggstatsplot::ggscatterstats(
  data = datasets::iris,
  x = Petal.Length,
  y = Sepal.Length,
  centrality.param = 'median',
  type = 'robust',
  marginal.type = 'density'
)
```

grouped_ggbetweenstats

Violin plots for group or condition comparisons repeated across all levels of a grouping variable.

Description

A combined plot of comparison plot created for levels of a grouping variable.

Usage

```
grouped_ggbetweenstats(grouping.var, title.prefix = "Group", data = NULL, x,
  y, plot.type = "boxviolin", type = "parametric",
  effsize.type = "unbiased", xlab = NULL, ylab = NULL, caption = NULL,
  k = 3, var.equal = FALSE, nboot = 100, notch = FALSE,
  notchwidth = 0.5, linetype = "solid", outlier.tagging = NULL,
  outlier.label = NULL, outlier.label.color = "black",
  outlier.color = "black", outlier.coef = 1.5, mean.plotting = TRUE,
  mean.size = 5, mean.color = "darkred", messages = TRUE, ...)
```


Arguments

grouping.var	Grouping variable.
title.prefix	Character specifying the prefix text for the fixed plot title (name of each factor level) (Default: "Group").
data	Dataframe from which variables specified are preferentially to be taken.
x	The grouping variable.
y	The response - a vector of length the number of rows of x.
plot.type	Character describing the <i>type</i> of plot. Currently supported plots are "box" (for pure boxplots), "violin" (for pure violin plots), and "boxviolin" (for a mix of box and violin plots; default).
type	Type of statistic expected ("parametric" or "nonparametric" or "robust").Corresponding abbreviations are also accepted: "p" (for parametric), "np" (nonparametric), "r" (robust), resp.
effsize.type	Type of effect size needed for <i>parametric</i> tests ("biased" (Cohen's <i>d</i> for t-test ; partial eta-squared for anova) or "unbiased" (Hedge's <i>g</i> for t-test ; partial omega-squared for anova)).
xlab	Label for x axis variable.
ylab	Label for y axis variable.
caption	The text for the plot caption.
k	Number of decimal places expected for results.
var.equal	A logical variable indicating whether to treat the two variances as being equal (Default: FALSE).
nboot	Number of bootstrap samples for computing effect size (Default: 100).
notch	A logical. If FALSE (default), a standard box plot will be displayed. If TRUE, a notched box plot will be used. Notches are used to compare groups; if the notches of two boxes do not overlap, this suggests that the medians are significantly different. In a notched box plot, the notches extend $1.58 * IQR / \sqrt{n}$. This gives a roughly 95 interval for comparing medians. IQR: Inter-Quartile Range.
notchwidth	For a notched box plot, width of the notch relative to the body (default 0.5).
linetype	Character strings ("blank", "solid", "dashed", "dotted", "dotdash", "longdash", and "twodash") specifying the type of line to draw box plots (Default: "solid"). Alternatively, the numbers 0 to 6 can be used (0 for "blank", 1 for "solid", etc.).
outlier.tagging	Decides whether outliers should be tagged (Default: FALSE).
outlier.label	Label to put on the outliers that have been tagged.
outlier.label.color	Color for the label to to put on the outliers that have been tagged (Default: "black").
outlier.color	Default aesthetics for outliers (Default: "black").
outlier.coef	Coefficient for outlier detection using Tukey's method. With Tukey's method, outliers are below (1st Quartile) or above (3rd Quartile) outlier.coef times the Inter-Quartile Range (IQR) (Default: 1.5).

<code>mean.plotting</code>	Decides whether mean is to be highlighted and its value to be displayed (Default: TRUE).
<code>mean.size</code>	Point size for the data point corresponding to mean (Default: 5).
<code>mean.color</code>	Color for the data point corresponding to mean (Default: "darkred").
<code>messages</code>	Decides whether messages references, notes, and warnings are to be displayed (Default: TRUE).
<code>...</code>	Arguments passed on to <code>combine_plots</code>
	title.text String or plotmath expression to be drawn as title for the <i>combined plot</i> .
	title.color Text color for title.
	title.size Point size of title text.
	title.vjust Vertical justification for title. Default = 0.5 (centered on y). 0 = baseline at y, 1 = ascender at y.
	title.hjust Horizontal justification for title. Default = 0.5 (centered on x). 0 = flush-left at x, 1 = flush-right.
	title.fontface The font face ("plain", "bold", etc.) for title.
	caption.text String or plotmath expression to be drawn as the caption for the <i>combined plot</i> .
	caption.color Text color for caption.
	caption.size Point size of title text.
	caption.vjust Vertical justification for caption. Default = 0.5 (centered on y). 0 = baseline at y, 1 = ascender at y.
	caption.hjust Horizontal justification for caption. Default = 0.5 (centered on x). 0 = flush-left at x, 1 = flush-right.
	caption.fontface The font face ("plain", "bold", "italic", "bold.italic") for caption.
	sub.text The label with which the <i>combined plot</i> should be annotated. Can be a plotmath expression.
	sub.color Text color for annotation label.
	sub.size Point size of annotation text.
	sub.x The x position of annotation label.
	sub.y The y position of annotation label.
	sub.hjust Horizontal justification for annotation label.
	sub.vjust Vertical justification for annotation label.
	sub.vpadding Vertical padding. The total vertical space added to the label, given in grid units. By default, this is added equally above and below the label. However, by changing the y and vjust parameters, this can be changed.
	sub.fontface The font face ("plain", "bold", "italic", "bold.italic") for the annotation label.
	sub.angle Angle at which annotation label is to be drawn.
	sub.lineheight Line height of annotation label.
	title.caption.rel.heights Numerical vector of relative columns heights while combining (title, plot, caption).

title.rel.heights Numerical vector of relative columns heights while combining (title, plot).

caption.rel.heights Numerical vector of relative columns heights while combining (plot, caption).

Author(s)

Indrajeet Patil

See Also

[ggbetweenstats](#)

Examples

```
# to get reproducible results from bootstrapping
set.seed(123)

# the most basic function call
ggstatsplot::grouped_ggbetweenstats(
  data = mtcars,
  x = cyl,
  y = wt,
  grouping.var = am
)
```

grouped_ggcorrmat	<i>Visualization of a correlalogram (or correlation matrix) using 'ggplot2'/'ggcorrplot' for all levels of a grouping variable</i>
-------------------	--

Description

Helper function for `ggstatsplot::ggcorrmat` to apply this function across multiple levels of a given factor and combining the resulting plots using `ggstatsplot::combine_plots`.

Usage

```
grouped_ggcorrmat(grouping.var, title.prefix = "Group", data, cor.vars,
  cor.vars.names = NULL, output = "plot", type = "full",
  method = "square", corr.method = "pearson", exact = FALSE,
  continuity = TRUE, beta = 0.2, digits = 2, sig.level = 0.05,
  hc.order = FALSE, hc.method = "complete", lab = TRUE,
  colors = c("#E69F00", "white", "#009E73"), outline.color = "black",
  ggtheme = ggplot2::theme_gray, ggstatsplot.theme = TRUE,
  subtitle = NULL, caption = NULL, caption.default = TRUE,
  lab.col = "black", lab.size = 5, insig = "pch", pch = 4,
```

```
pch.col = "black", pch.cex = 11, tl.cex = 12, tl.col = "black",
tl.srt = 45, axis.text.x.margin.t = 0, axis.text.x.margin.r = 0,
axis.text.x.margin.b = 0, axis.text.x.margin.l = 0,
legend.title.margin = TRUE, t.margin = unit(0, "mm"), b.margin = unit(3,
"mm"), messages = TRUE, ...)
```

Arguments

<code>grouping.var</code>	Grouping variable.
<code>title.prefix</code>	Character specifying the prefix text for the fixed plot title (name of each factor level) (Default: "Group").
<code>data</code>	Dataframe from which variables specified are preferentially to be taken.
<code>cor.vars</code>	List of variables for which the correlation matrix is to be computed and visualized.
<code>cor.vars.names</code>	Optional list of names to be used for <code>cor.vars</code> . The names should be entered in the same order.
<code>output</code>	Expected output from this function: "plot" (visualization matrix) or "correlations" (correlation matrix) or "p-values" (matrix of p-values).
<code>type</code>	Character, "full" (default), "upper" or "lower", display full matrix, lower triangular or upper triangular matrix.
<code>method</code>	Character argument that decides the visualization method of correlation matrix to be used. Allowed values are "square" (default), "circle"
<code>corr.method</code>	A character string indicating which correlation coefficient is to be computed ("pearson" (default) or "kendall" or "spearman"). "robust" can also be entered but only if output argument is set to either "correlations" or "p-values". The robust correlation used is percentage bend correlation (see <code>?WRS2::pball</code>). Abbreviations will not work.
<code>exact</code>	A logical indicating whether an exact <i>p</i> -value should be computed. Used for Kendall's <i>tau</i> and Spearman's <i>rho</i> . For more details, see <code>?stats::cor.test</code> .
<code>continuity</code>	A logical. If TRUE, a continuity correction is used for Kendall's <i>tau</i> and Spearman's <i>rho</i> when not computed exactly (Default: TRUE).
<code>beta</code>	A numeric bending constant for robust correlation coefficient (Default: 0.2).
<code>digits</code>	Decides the number of decimal digits to be added into the plot (Default: 2).
<code>sig.level</code>	Significance level (Default: 0.05). If the p-value in p-mat (p-value matrix) is bigger than <code>sig.level</code> , then the corresponding correlation coefficient is regarded as insignificant.
<code>hc.order</code>	Logical value. If TRUE, correlation matrix will be hc.ordered using <code>hclust</code> function (Default is FALSE).
<code>hc.method</code>	The agglomeration method to be used in <code>hclust</code> (see <code>?hclust</code>).
<code>lab</code>	Logical value. If TRUE, correlation coefficient values will be displayed in the plot.
<code>colors</code>	A vector of 3 colors for low, mid, and high correlation values.
<code>outline.color</code>	The outline color of square or circle. Default value is "gray".

<code>ggtheme</code>	A function, <code>ggplot2</code> theme name. Default value is <code>ggplot2::theme_gray</code> . Allowed values are the official <code>ggplot2</code> themes, including <code>theme_bw</code> , <code>theme_minimal</code> , <code>theme_classic</code> , <code>theme_void</code> , etc.
<code>ggstatsplot.theme</code>	A logical. Decides whether default theme for <code>ggstatsplot</code> , which is <code>theme_mpr1</code> , is to be overlaid on the entered theme (Default: <code>ggstatsplot.theme = TRUE</code>).
<code>subtitle</code>	The text for the plot subtitle.
<code>caption</code>	The text for the plot caption. If not specified (if it is <code>NULL</code> , i.e.), a default caption will be shown.
<code>caption.default</code>	Logical decides whether the default caption should be shown.
<code>lab.col</code>	Color to be used for the correlation coefficient labels (applicable only when <code>lab = TRUE</code>).
<code>lab.size</code>	Size to be used for the correlation coefficient labels (applicable only when <code>lab = TRUE</code>).
<code>insig</code>	Character used to show specialized insignificant correlation coefficients (" <code>pch</code> " (default) or " <code>blank</code> "). If " <code>blank</code> ", the corresponding glyphs will be removed; if " <code>pch</code> " is used, characters (see <code>?pch</code> for details) will be added on the corresponding glyphs.
<code>pch</code>	Decides the glyphs (read point shapes) to be used for insignificant correlation coefficients (only valid when <code>insig = "pch"</code>). Default value is <code>pch = 4</code> .
<code>pch.col</code> , <code>pch.cex</code>	The color and the <code>cex</code> (size) of <code>pch</code> (only valid when <code>insig = "pch"</code>). Defaults are <code>pch.col = "#F0E442"</code> and <code>pch.cex = 10</code> .
<code>tl.cex</code> , <code>tl.col</code> , <code>tl.srt</code>	The size, the color, and the string rotation of text label (variable names, i.e.).
<code>axis.text.x.margin.t</code> , <code>axis.text.x.margin.r</code> , <code>axis.text.x.margin.b</code> , <code>axis.text.x.margin.l</code>	Margins between x-axis and the variable name texts (t: top, r: right, b: bottom, l:left), especially useful in case the names are slanted, i.e. when the <code>tl.srt</code> is between 45 and 75 (Defaults: 0, 0, 0, 0, resp.).
<code>legend.title.margin</code>	Logical indicating whether to adjust the margin between legend title and the colorbar (Default: <code>TRUE</code>).
<code>t.margin</code> , <code>b.margin</code>	Margins in grid units. For more details, see <code>?grid::unit()</code> .
<code>messages</code>	Decides whether messages references, notes, and warnings are to be displayed (Default: <code>TRUE</code>).
<code>...</code>	Arguments passed on to <code>combine_plots</code>
	title.text String or plotmath expression to be drawn as title for the <i>combined plot</i> .
	title.color Text color for title.
	title.size Point size of title text.
	title.vjust Vertical justification for title. Default = 0.5 (centered on y). 0 = baseline at y, 1 = ascender at y.

title.hjust Horizontal justification for title. Default = 0.5 (centered on x). 0 = flush-left at x, 1 = flush-right.

title.fontface The font face ("plain", "bold", etc.) for title.

caption.text String or plotmath expression to be drawn as the caption for the *combined plot*.

caption.color Text color for caption.

caption.size Point size of title text.

caption.vjust Vertical justification for caption. Default = 0.5 (centered on y). 0 = baseline at y, 1 = ascender at y.

caption.hjust Horizontal justification for caption. Default = 0.5 (centered on x). 0 = flush-left at x, 1 = flush-right.

caption.fontface The font face ("plain", "bold", "italic", "bold.italic") for caption.

sub.text The label with which the *combined plot* should be annotated. Can be a plotmath expression.

sub.color Text color for annotation label.

sub.size Point size of annotation text.

sub.x The x position of annotation label.

sub.y The y position of annotation label.

sub.hjust Horizontal justification for annotation label.

sub.vjust Vertical justification for annotation label.

sub.vpadding Vertical padding. The total vertical space added to the label, given in grid units. By default, this is added equally above and below the label. However, by changing the y and vjust parameters, this can be changed.

sub.fontface The font face ("plain", "bold", "italic", "bold.italic") for the annotation label.

sub.angle Angle at which annotation label is to be drawn.

sub.lineheight Line height of annotation label.

title.caption.rel.heights Numerical vector of relative columns heights while combining (title, plot, caption).

title.rel.heights Numerical vector of relative columns heights while combining (title, plot).

caption.rel.heights Numerical vector of relative columns heights while combining (plot, caption).

Note

If you are using R Notebook or Markdown and see a blank image being inserted when a chunk is executed, this behavior can be turned off by setting `legend.title.margin = FALSE`.

Author(s)

Indrajeet Patil

See Also[ggcorrmat](#)**Examples**

```
# for getting correlations
ggstatsplot::grouped_ggcorrmat(
  data = datasets::iris,
  grouping.var = Species,
  cor.vars = Sepal.Length:Petal.Width,
  output = "plot",
  nrow = 3,
  ncol = 1
)

# for getting correlations
ggstatsplot::grouped_ggcorrmat(
  data = datasets::iris,
  grouping.var = Species,
  cor.vars = Sepal.Length:Petal.Width,
  output = "correlations"
)
```

grouped_gghistostats *Grouped histograms for distribution of a numeric variable*

Description

Helper function for `ggstatsplot::gghistostats` to apply this function across multiple levels of a given factor and combining the resulting plots using `ggstatsplot::combine_plots`.

Usage

```
grouped_gghistostats(grouping.var, title.prefix = "Group", data, x,
  bar.measure = "count", xlab = NULL, subtitle = NULL, caption = NULL,
  type = "parametric", test.value = 0, bf.prior = 0.707,
  bf.message = TRUE, k = 3, low.color = "#0072B2",
  high.color = "#D55E00", results.subtitle = TRUE,
  legend.title.margin = TRUE, t.margin = unit(0, "mm"), b.margin = unit(3,
  "mm"), centrality.param = NULL, centrality.color = "blue",
  centrality.size = 1.2, centrality.linetype = "dashed",
  test.value.line = FALSE, test.value.color = "black",
  test.value.size = 1.2, test.value.linetype = "dashed",
  line.labeller = FALSE, line.labeller.y = -2, binwidth = NULL,
  messages = TRUE, ...)
```

Arguments

grouping.var	Grouping variable.
title.prefix	Character specifying the prefix text for the fixed plot title (name of each factor level) (Default: "Group").
data	Dataframe from which variables specified are preferentially to be taken.
x	A numeric variable.
bar.measure	Character describing what value needs to be represented as height in the bar chart. This can either be "count", which shows number of points in bin, or "density", which density of points in bin, scaled to integrate to 1, or "proportion", which shows relative frequencies of observations in each bin.
xlab	Label for x axis variable.
subtitle	The text for the plot subtitle <i>if</i> you don't want results from one sample test to be displayed.
caption	The text for the plot caption.
type	Type of statistic expected ("parametric" or "nonparametric" or "bayes"). Abbreviations accepted are "p" or "np" or "bf", respectively.
test.value	A number specifying the value of the null hypothesis.
bf.prior	A number between 0.5 and 2 (default 0.707), the prior width to use in calculating Bayes factors.
bf.message	Logical. Decides whether to display Bayes Factor in favor of null hypothesis for parametric test if the null hypothesis can't be rejected (Default: bf.message = TRUE).
k	Number of decimal places expected for results.
low.color, high.color	Colors for low and high ends of the gradient. Defaults are colorblind-friendly.
results.subtitle	Decides whether the results of statistical tests are to be displayed as subtitle (Default: results.subtitle = TRUE). If set to FALSE, no statistical tests will be run.
legend.title.margin	Adjusting the margin between legend title and the colorbar.
t.margin, b.margin	Margins in grid units. For more details, see ?grid::unit().
centrality.para	Decides <i>which</i> measure of central tendency ("mean" or "median") is to be displayed as a vertical line.
centrality.color	Decides color for the vertical line for centrality parameter (Default: "blue").
centrality.size	Decides size for the vertical line for centrality parameter (Default: 1.2).
centrality.linetype	Decides linetype for the vertical line for centrality parameter (Default: "dashed").
test.value.line	Decides whether test value is to be displayed as a vertical line (Default: FALSE).

<code>test.value.color</code>	Decides color for the vertical line denoting test value (Default: "black").
<code>test.value.size</code>	Decides size for the vertical line for test value (Default: 1.2).
<code>test.value.linetype</code>	Decides linetype for the vertical line for test value (Default: "dashed").
<code>line.labeller</code>	A logical that decides whether line labels should be displayed (Default: FALSE).
<code>line.labeller.y</code>	A numeric denoting the y-coordinate for displaying line labels (Default: -2).
<code>binwidth</code>	The width of the bins. Can be specified as a numeric value, or a function that calculates width from x. The default is to use bins bins that cover the range of the data. You should always override this value, exploring multiple widths to find the best to illustrate the stories in your data.
<code>messages</code>	Decides whether messages references, notes, and warnings are to be displayed (Default: TRUE).
<code>...</code>	Arguments passed on to <code>combine_plots</code>
	title.text String or plotmath expression to be drawn as title for the <i>combined plot</i> .
	title.color Text color for title.
	title.size Point size of title text.
	title.vjust Vertical justification for title. Default = 0.5 (centered on y). 0 = baseline at y, 1 = ascender at y.
	title.hjust Horizontal justification for title. Default = 0.5 (centered on x). 0 = flush-left at x, 1 = flush-right.
	title.fontface The font face ("plain", "bold", etc.) for title.
	caption.text String or plotmath expression to be drawn as the caption for the <i>combined plot</i> .
	caption.color Text color for caption.
	caption.size Point size of title text.
	caption.vjust Vertical justification for caption. Default = 0.5 (centered on y). 0 = baseline at y, 1 = ascender at y.
	caption.hjust Horizontal justification for caption. Default = 0.5 (centered on x). 0 = flush-left at x, 1 = flush-right.
	caption.fontface The font face ("plain", "bold", "italic", "bold.italic") for caption.
	sub.text The label with which the <i>combined plot</i> should be annotated. Can be a plotmath expression.
	sub.color Text color for annotation label.
	sub.size Point size of annotation text.
	sub.x The x position of annotation label.
	sub.y The y position of annotation label.
	sub.hjust Horizontal justification for annotation label.
	sub.vjust Vertical justification for annotation label.

sub.vpadding Vertical padding. The total vertical space added to the label, given in grid units. By default, this is added equally above and below the label. However, by changing the `y` and `vjust` parameters, this can be changed.

sub.fontface The font face ("plain", "bold", "italic", "bold.italic") for the annotation label.

sub.angle Angle at which annotation label is to be drawn.

sub.lineheight Line height of annotation label.

title.caption.rel.heights Numerical vector of relative columns heights while combining (title, plot, caption).

title.rel.heights Numerical vector of relative columns heights while combining (title, plot).

caption.rel.heights Numerical vector of relative columns heights while combining (plot, caption).

Author(s)

Indrajeet Patil

See Also

[gghistostats](#)

Examples

```
ggstatsplot::grouped_gghistostats(
  data = iris,
  x = Sepal.Length,
  test.value = 5,
  grouping.var = Species,
  nrow = 1,
  messages = FALSE
)
```

grouped_ggpiestats *Grouped pie charts with statistical tests*

Description

Helper function for `ggstatsplot::ggpiestats` to apply this function across multiple levels of a given factor and combining the resulting plots using `ggstatsplot::combine_plots`.

Usage

```
grouped_ggpiestats(grouping.var, title.prefix = "Group", data, main,
  condition = NULL, factor.levels = NULL, stat.title = NULL,
  caption = NULL, legend.title = NULL, facet.wrap.name = NULL, k = 3,
  facet.proptest = TRUE, messages = TRUE, ...)
```

Arguments

grouping.var	Grouping variable.
title.prefix	Character specifying the prefix text for the fixed plot title (name of each factor level) (Default: "Group").
data	The data as a data frame.
main	A string naming the variable to use as the rows in the contingency table.
condition	A string naming the variable to use as the columns in the contingency table.
factor.levels	A character vector with labels for factor levels of main variable.
stat.title	Title for the effect being investigated with the chi-square test.
caption	The text for the plot caption.
legend.title	Title of legend.
facet.wrap.name	The text for the facet_wrap variable label.
k	Number of decimal places expected for results.
facet.proptest	Decides whether proportion test for main variable is to be carried out for each level of condition (Default: TRUE).
messages	Decides whether messages references, notes, and warnings are to be displayed (Default: TRUE).
...	Arguments passed on to combine_plots

title.text String or plotmath expression to be drawn as title for the *combined plot*.
title.color Text color for title.
title.size Point size of title text.
title.vjust Vertical justification for title. Default = 0.5 (centered on y). 0 = baseline at y, 1 = ascender at y.
title.hjust Horizontal justification for title. Default = 0.5 (centered on x). 0 = flush-left at x, 1 = flush-right.
title.fontface The font face ("plain", "bold", etc.) for title.
caption.text String or plotmath expression to be drawn as the caption for the *combined plot*.
caption.color Text color for caption.
caption.size Point size of title text.
caption.vjust Vertical justification for caption. Default = 0.5 (centered on y). 0 = baseline at y, 1 = ascender at y.
caption.hjust Horizontal justification for caption. Default = 0.5 (centered on x). 0 = flush-left at x, 1 = flush-right.

- caption.fontface** The font face ("plain", "bold", "italic", "bold.italic") for caption.
- sub.text** The label with which the *combined plot* should be annotated. Can be a plotmath expression.
- sub.color** Text color for annotation label.
- sub.size** Point size of annotation text.
- sub.x** The x position of annotation label.
- sub.y** The y position of annotation label.
- sub.hjust** Horizontal justification for annotation label.
- sub.vjust** Vertical justification for annotation label.
- sub.vpadding** Vertical padding. The total vertical space added to the label, given in grid units. By default, this is added equally above and below the label. However, by changing the y and vjust parameters, this can be changed.
- sub.fontface** The font face ("plain", "bold", "italic", "bold.italic") for the annotation label.
- sub.angle** Angle at which annotation label is to be drawn.
- sub.lineheight** Line height of annotation label.
- title.caption.rel.heights** Numerical vector of relative columns heights while combining (title, plot, caption).
- title.rel.heights** Numerical vector of relative columns heights while combining (title, plot).
- caption.rel.heights** Numerical vector of relative columns heights while combining (plot, caption).

Author(s)

Indrajeet Patil

See Also

[ggpiestats](#)

Examples

```
# grouped one-sample proportion tests
ggstatsplot::grouped_ggpiestats(
  data = mtcars,
  grouping.var = am,
  main = cyl
)
```

grouped_ggscatterstats

Scatterplot with marginal distributions for all levels of a grouping variable

Description

Grouped scatterplots from ggplot2 combined with marginal histograms/boxplots/density plots with statistical details added as a subtitle.

Usage

```
grouped_ggscatterstats(grouping.var, title.prefix = "Group", data, x, y,
  xlab = NULL, ylab = NULL, line.size = 1.5, line.color = "blue",
  marginal = TRUE, marginal.type = "histogram", marginal.size = 5,
  margins = c("both", "x", "y"), width.jitter = NULL,
  height.jitter = NULL, xfill = "#009E73", yfill = "#D55E00",
  centrality.param = NULL, type = "pearson", results.subtitle = NULL,
  caption = NULL, maxit = 500, k = 3, axes.range.restrict = FALSE,
  messages = TRUE, ...)
```

Arguments

grouping.var	Grouping variable.
title.prefix	Character specifying the prefix text for the fixed plot title (name of each factor level) (Default: "Group").
data	Dataframe from which variables specified are preferentially to be taken.
x	A vector containing the explanatory variable.
y	The response - a vector of length the number of rows of x.
xlab	Label for x axis variable.
ylab	Label for y axis variable.
line.size	Size for the regression line.
line.color	color for the regression line.
marginal	Decides whether ggExtra::ggMarginal() plots will be displayed; the default is TRUE.
marginal.type	Type of marginal distribution to be plotted on the axes ("histogram", "boxplot", "density", "violin").
marginal.size	Integer describing the relative size of the marginal plots compared to the main plot. A size of 5 means that the main plot is 5x wider and 5x taller than the marginal plots.
margins	Character describing along which margins to show the plots. Any of the following arguments are accepted: "both", "x", "y".
width.jitter	Degree of jitter in x direction. Defaults to 40% of the resolution of the data.

height.jitter	Degree of jitter in y direction. Defaults to 40% of the resolution of the data.
xfill	color fill for x axis distribution (default: "#009E73").
yfill	color fill for y axis distribution (default: "#D55E00").
centrality.param	Decides <i>which</i> measure of central tendency ("mean" or "median") is to be displayed as vertical (for x) and horizontal (for y) lines.
type	Type of association between paired samples required ("parametric": Pearson's product moment correlation coefficient" or "nonparametric": Spearman's rho" or "robust": Robust regression using an M estimator"). Corresponding abbreviations are also accepted: "p" (for parametric/pearson's), "np" (nonparametric/spearman), "r" (robust), resp.
results.subtitle	Decides whether the results of statistical tests are to be displayed as subtitle.
caption	The text for the plot caption.
maxit	Maximum number of iterations for robust linear regression or bootstrap samples to compute Spearman's rho confidence intervals (Default: 500).
k	Number of decimal places expected for results.
axes.range.restrict	Logical decides whether to restrict the axes values ranges to min and max values of the x and y variables (Default: FALSE).
messages	Decides whether messages references, notes, and warnings are to be displayed (Default: TRUE).
...	Arguments passed on to <code>combine_plots</code>
	title.text String or plotmath expression to be drawn as title for the <i>combined plot</i> .
	title.color Text color for title.
	title.size Point size of title text.
	title.vjust Vertical justification for title. Default = 0.5 (centered on y). 0 = baseline at y, 1 = ascender at y.
	title.hjust Horizontal justification for title. Default = 0.5 (centered on x). 0 = flush-left at x, 1 = flush-right.
	title.fontface The font face ("plain", "bold", etc.) for title.
	caption.text String or plotmath expression to be drawn as the caption for the <i>combined plot</i> .
	caption.color Text color for caption.
	caption.size Point size of title text.
	caption.vjust Vertical justification for caption. Default = 0.5 (centered on y). 0 = baseline at y, 1 = ascender at y.
	caption.hjust Horizontal justification for caption. Default = 0.5 (centered on x). 0 = flush-left at x, 1 = flush-right.
	caption.fontface The font face ("plain", "bold", "italic", "bold.italic") for caption.
	sub.text The label with which the <i>combined plot</i> should be annotated. Can be a plotmath expression.

sub.color Text color for annotation label.

sub.size Point size of annotation text.

sub.x The x position of annotation label.

sub.y The y position of annotation label.

sub.hjust Horizontal justification for annotation label.

sub.vjust Vertical justification for annotation label.

sub.vpadding Vertical padding. The total vertical space added to the label, given in grid units. By default, this is added equally above and below the label. However, by changing the y and vjust parameters, this can be changed.

sub.fontface The font face ("plain", "bold", "italic", "bold.italic") for the annotation label.

sub.angle Angle at which annotation label is to be drawn.

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title.caption.rel.heights Numerical vector of relative columns heights while combining (title, plot, caption).

title.rel.heights Numerical vector of relative columns heights while combining (title, plot).

caption.rel.heights Numerical vector of relative columns heights while combining (plot, caption).

Author(s)

Indrajeet Patil

See Also

[ggscatterstats](#) [ggcorrmat](#) [grouped_ggcorrmat](#)

Examples

```
# to ensure reproducibility
set.seed(123)

# basic function call
ggstatsplot::grouped_ggscatterstats(
  data = datasets::iris,
  x = Sepal.Length,
  y = Sepal.Width,
  grouping.var = Species,
  messages = FALSE
)
```

specify_decimal_p *Custom function for getting specified number of decimal places in results for p-value*

Description

Function to format an R object for pretty printing with a specified (k) number of decimal places. The function also allows highly significant p-values to be denoted as "p < 0.001" rather than "p = 0.000".

Usage

```
specify_decimal_p(x, k = 3, p.value = FALSE)
```

Arguments

x A numeric variable.
k Number of digits after decimal point (should be an integer) (Default: k = 3).
p.value Decides whether the number is a p-value (Default: FALSE).

Value

Formatted numeric values.

Author(s)

Indrajeet Patil

theme_mpr1 *Default theme used in all ggstatsplot package plots*

Description

Common theme used across all plots generated in ggstatsplot and *assumed* by the author to be aesthetically pleasing to the user/reader.

Usage

```
theme_mpr1()
```

Value

A ggplot2 object with the theme_mpr1 theme.

Author(s)

Indrajeet Patil

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