Package ‘likert’

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Type Package

Title Analysis and Visualization Likert Items

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Author Jason Bryer <jason@bryer.org>, Kimberly Speerschneider <kimkspeer@gmail.com>

Maintainer Jason Bryer <jason@bryer.org>


BugReports https://github.com/jbryer/likert/issues

Description An approach to analyzing Likert response items, with an emphasis on visualizations. The stacked bar plot is the preferred method for presenting Likert results. Tabular results are also implemented along with density plots to assist researchers in determining whether Likert responses can be used quantitatively instead of qualitatively. See the likert(), summary.likert(), and plot.likert() functions to get started.

License GPL

LazyLoad yes

VignetteBuilder utils

Depends R (>= 3.0),ggplot2,xtable

Imports psych,reshape2,gridExtra,grid,plyr

Suggests devtools,shiny

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NeedsCompilation no

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**Description**

Likert Analysis and Visualization

**Author(s)**

<jason@bryer.org>
**abs_formatter**

| abs_formatter                                | Absolute value formatter for continuous_scale |

**Description**

This will print the absolute value for labeling on axis. Useful for stacked bar plots where negative values are not negative percentages but represent negative groups.

**Usage**

abs_formatter(x)

**Arguments**

- **x**: value to be reformatted.

**Value**

the absolute value of x.

**align.plots**

Adapted from ggExtra package which is no longer available. This is related to an experimental mlpsa plot that will combine the circular plot along with the two individual distributions.

**Description**

Adapted from ggExtra package which is no longer available. This is related to an experimental mlpsa plot that will combine the circular plot along with the two individual distributions.

**Usage**

```r
## S3 method for class 'plots'
align(gl, ...)
```

**Arguments**

- **gl**: grid.layout
- **...**: graphic elements to combine.

**References**

http://groups.google.com/group/ggplot2/browse_thread/thread/1b859d6b4b441c90 http://ggextra.googlecode.com/svn/trunk/R/align.r
Fictitious dataset with importance and satisfaction results across five different offices.

Description

This data set is used in the GapAnalysis demo and is used to demonstrate how the likert package handles a gap analysis.

Format

a data frame with 68 observations of 11 variables.

label_wrap_mod  Wrap label text.

Description

Wrap label text.

Usage

label_wrap_mod(value, width = 25)

Arguments

value  vector (converted using as.character) to be wrapped.
width  the maximum width of each line in characters.

Adapted from https://github.com/hadley/ggplot2/wiki/labeller

likert  Analyze Likert type items.

Description

This function will provide various statistics about a set of likert items. The resulting object will have the following items:

Usage

likert(items, summary, grouping = NULL, factors = NULL, importance, nlevels = length(levels(items[, 1])))
Arguments

- **items**
  - data frame containing the likert based items. The variables in the data frame should be factors.

- **summary**
  - a pre-summarized data frame. The first column must be the items and the remaining columns are the levels (e.g. strongly disagree, disagree, etc).

- **grouping**
  - (optional) should the results be summarized by the given grouping variable.

- **factors**
  - a vector with length(factors) == ncol(items) defining which factor each column belongs to. The values correspond to the factor label.

- **importance**
  - a data frame of the same dimensions as items containing an importance rating for each item. The order of columns should match and the names from items will be used.

- **nlevels**
  - number of possible levels. Only necessary if there are missing levels.

Details

- **results** - this data frame will contain a column 'Item', 'Group' (if a grouping variable was specified, and a column for each level of the items (e.g. agree, disagree, etc.). The value within each cell corresponds to the percentage of responses for that level and group.

- **items** - a copy of the original items data frame.

- **grouping** - a copy of the original grouping vector.

- **nlevels** - the number of levels used in the calculations.

Value

- a likert class with the following elements: results, items, grouping, nlevels, and summary.

See Also

- plot.likert
- summary.likert

Examples

```r
data(pisaitems)
items29 <- pisaitems[, substr(names(pisaitems), 1,5) == '/quotesingle.Var/ST25Q/quotesingle.Var]
names(items29) <- c("Magazines", "Comic books", "Fiction", "Non-fiction books", "Newspapers")
l29 <- likert(items29)
summary(l29)
plot(l29)
```
likert.bar.plot  
*Bar Plot for Likert Items.*

**Description**

Bar plot for the results of `likert`.

**Usage**

```r
likert.bar.plot(l, group.order, center = (l$nlevels - 1)/2 + 1, ...)
```

**Arguments**

- `l`: results of `likert`.
- `group.order`: the order in which groups (for grouped items) or items (for non-grouped items) should be plotted.
- `center`: specifies which level should be treated as the center. For example, `center = 3` would use the third level as the center whereas `center = 3.5` would indicate no specific level is the center but <= 3 are low levels and >= 4 are high levels (i.e. used for forced choice items or those without a neutral option). This also influences where the color breaks from low to high.
- `...`: passed to `likert.options`
- `likert`: object of type `likert`.

**See Also**

- `plot.likert`
- `likert.heat.plot`
- `likert.bar.plot`
- `likert.density.plot`

likert.density.plot  
*Creates a density plot for likert items.*

**Description**

This function will create a visualization that treats the likert items as a continuous variable.

**Usage**

```r
likert.density.plot(likert, facet = TRUE, bw = 0.5, legend, ...)
```
Arguments

likert object of type likert.

facet for non-grouped items, should each density distribution be plotted in a separate facet.

bw the smoothing bandwidth. This is often set to the standard deviation but this is often inadequate for Likert type items. The value of 0.5 is used since the difference between any two adjacent levels is one.

legend title for the legend.

... parameters passed to density.

See Also

plot.likert

Description

Internal method.

Usage

likert.heat.plot(likert, low.color = "white", high.color = "blue",
    text.color = "black", text.size = 4, wrap = 50, ...)

Arguments

likert object of type likert.

low.color color for low values.

high.color color for high values.

text.color color of text attributes.

text.size size of text attributes.

wrap width to wrap label text for non-grouped likert objects.

... currently unused.

See Also

plot.likert
likert.bar.plot
likert.histogram.plot  

Histogram of number of responses.

Description

Plots a histogram of the number of responses for each item and group (if specified). Negative values (in maroon by default) indicate the number of missing values for that item and group.

Usage

likert.histogram.plot(l, xlab = "n", plot.missing = TRUE,  
bar.color = "grey70", missing.bar.color = "maroon",  
label.completed = "Completed", label.missing = "Missing",  
legend.position = "bottom", wrap = ifelse(is.null(l$grouping), 50, 100),  
order, group.order, panel.arrange = "v", panel.strip.color = "#F0F0F0",  
text.size = 2.5, ...)

Arguments

l  
results of likert.

xlab  
label used for the x-axis.

plot.missing  
if TRUE, missing values will be plotted to the left of the x-axis.

bar.color  
the bar color.

missing.bar.color  
the color of the bar for missing values.

label.completed  
the color to use in the legend representing the count of complete values.

label.missing  
the label to use in the legend representing the count of missing values.

legend.position  
location of the legend.

wrap  
number of characters before warping the text in the panel strips.

order  
the order of the items.

group.order  
the order in which groups (for grouped items) or items (for non-grouped items) should be plotted.

panel.arrange  
v for vertical or h for horizontal.

panel.strip.color  
the color for panels.

text.size  
text size.

...  
other ggplot2 parameters.
**likert.matrix.plot**

*Matrix plot (experimental)*

**Description**

Matrix plot (experimental)

**Usage**

`likert.matrix.plot(likert, nSample = nrow(likert$items), ...)`

**Arguments**

- `likert`: results of `likert`.
- `nSample`: random sample of all rows. This function may take a while to run with large datasets (including the `pisaitems` data). Plotting a random subsample allows for quicker development.
- `...`: parameters passed to `pairs.ordered.categorical`.

**likert.options**

*Builds an object with options for plotting `likert` results.*

**Description**

Builds an object with options for plotting `likert` results.

**Usage**

`likert.options(low.color = "#D8B365", high.color = "#5AB4AC", neutral.color = "grey90", neutral.color.ramp = "white", colors = NULL, plot.percent.low = TRUE, plot.percent.high = TRUE, plot.percent.neutral = TRUE, plot.percents = FALSE, text.size = 3, text.color = "black", centered = TRUE, include.center = TRUE, ordered = TRUE, wrap = 50, wrap.grouping = 50, legend = "Response", legend.position = "bottom", panel.arrange = "v", panel.strip.color = "#F0F0F0", ...)`

**Arguments**

- `low.color`: color for low values.
- `high.color`: color for high values.
- `neutral.color`: color for middle values (if odd number of levels).
- `neutral.color.ramp`: second color used when calling `colorRamp` with `low.color` and `high.color` to define the color palettes.
colors vector specifying the colors to use. This must be equal to the number of likert levels.

plot.percent.low whether to plot low percentages.

plot.percent.high whether to plot high percentages.

plot.percent.neutral whether to plot netural percentages.

plot.percents whether to label each category/bar.

text.size size of text attributes.

text.color color of text attributes.

centered if true, the bar plot will be centered around zero such that the lower half of levels will be negative.

include.center if TRUE, include the center level in the plot otherwise the center will be ex- cluded.

ordered reorder items from high to low.

wrap width to wrap label text for item labels

wrap.grouping width to wrap label text for group labels.

legend title for the legend.

legend.position the position for the legend ("left", "right", "bottom", "top", or two-element numeric vector).

panel.arrange how panels for grouped likert items should be arrange. Possible values are v (vertical, the default), h (horizontal), and NULL (auto fill horizontal and vertical)

panel.strip.color the background color for panel labels.

... included for future expansion.

mass Results from an administration of the Math Anxiety Scale Survey.

Description

A data frame of results of the Math Anxiety Scale Survey administered to 20 students in a statistics course. This data frame contains the original data and can be used to verify the pre-summarized procedures.

Format

data frame with 14 rows and 6 columns.

References

MathAnxiety

Pre-summarized results from an administration of the Math Anxiety Scale Survey.

Description

A data frame of presummarized results of the Math Anxiety Scale Survey administered to 20 students in a statistics course.

Format

data frame with 14 rows and 6 columns.

References


MathAnxietyGender

Pre-summarized results from an administration of the Math Anxiety Scale Survey grouped by gender.

Description

A data frame of presummarized results of the Math Anxiety Scale Survey administered to 20 students in a statistics course grouped by gender.

Format

data frame with 28 rows and 7 columns.

References

Description

North American (i.e. Canada, Mexico, and United States) results from the 2009 Programme of International Student Assessment (PISA) as provided by the Organization for Economic Co-operation and Development (OECD). See http://www.pisa.oecd.org/ for more information including the code book.

Format

a data frame 66,690 observations of 81 variables from North America.

Source

Organization for Economic Co-operation and Development

Description

This is an implementation of the S3 plot generic function. Based upon the type parameter this function will call either likert.bar.plot, likert.heat.plot, or likert.density.plot. See the help pages for those functions for all the available parameters to customize the aesthetics of the figure. Although those functions can be plotted directly, we recommend call the generic plot function.

Usage

```r
## S3 method for class 'likert'
plot(x, type = c("bar", "heat", "density"),
     include.histogram = FALSE, panel.widths = c(3, 1), panel.arrange = "v",
     panel.strip.color = "#F0F0F0", legend.position = "bottom", group.order,
     panel.background = element_rect(size = 1, color = "grey70", fill = NA), ...)
```

Arguments

- `x` the likert items to plot
- `type` the type of plot to create. Current values are bar and heat.
- `include.histogram` if TRUE, a histogram of count of responses is also plotted.
- `panel.widths` if include.histogram=TRUE, this vector of length two specifies the ratio of the left and right panels.
panel.arrange  how panels for grouped likert items should be arrange. Possible values are v (vertical, the default), h (horizontal), and NULL (auto fill horizontal and vertical)
panel.strip.color  the background color for panel labels.
legend.position  the position for the legend ("left", "right", "bottom", "top", or two-element numeric vector).
group.order  the order in which groups (for grouped items) or items (for non-grouped items) should be plotted.
panel.background  define background of the plot. See theme.
...  other parameters passed passed to likert.bar.plot or likert.heat.plot.

See Also
likert.bar.plot
likert.heat.plot
likert.density.plot
likert.histogram.plot

plot.likert.gap  Plots a set of likert items.

Description
This is an implementation of the S3 plot generic function. Based upon the type parameter this function will call either likert.bar.plot, likert.heat.plot, or likert.density.plot. See the help pages for those functions for all the available parameters to customize the aesthetics of the figure. Although those functions can be plotted directly, we recommend call the generic plot function.

Usage
## S3 method for class 'likert.gap'
plot(x, type = c("bar", "density"),
include.histogram = FALSE, panel.widths = c(3, 1), panel.arrange = "v",
panel.strip.color = "#F0F0F0", legend.position = "bottom",
panel.background = element_rect(size = 1, color = "grey70", fill = NA),
satisfaction.label = "Satisfaction", importance.label = "Importance",
legend, ...)
Arguments

x the likert items to plot
type the type of plot to create. Current values are bar and heat.
include.histogram if TRUE, a histogram of count of responses is also plotted.
panel.widths if include.histogram=TRUE, this vector of length two specifies the ratio of the left and right panels.
panel.arrange how panels for grouped likert items should be arrange. Possible values are v (vertical, the default), h (horizontal), and NULL (auto fill horizontal and vertical)
panel.strip.color the background color for panel labels.
legend.position the position for the legend ("left", "right", "bottom", "top", or two-element numeric vector).
panel.background define background of the plot. See theme.
satisfaction.label label used for satisfaction items.
importance.label label used for importance items.
legend title for the legend.
... other parameters passed passed to likert.bar.plot or likert.heat.plot.

See Also

likert.bar.plot
likert.heat.plot
likert.density.plot
likert.histogram.plot

print.likert

Prints results table.

Description

Prints results table.

Usage

## S3 method for class 'likert'
print(x, ...)

Arguments

x the likert class to print.
... parameters passed to print.data.frame.
print.likert.bar.plot  
*Print method for likert.bar.plot.* The primary purpose is to suppress the "Stacking not well defined when ymin != 0" warning printed by ggplot2 for bar plots that have negative bars (i.e. the centered plots).

**Description**
Print method for **likert.bar.plot**. The primary purpose is to suppress the "Stacking not well defined when ymin != 0" warning printed by ggplot2 for bar plots that have negative bars (i.e. the centered plots).

**Usage**
```r
## S3 method for class 'likert.bar.plot'
print(x, ...)
```

**Arguments**
- `x` a plot from **likert.bar.plot**.
- `...` other parameters passed to ggplot2.

---

print.likert.gap  
*Prints results table.*

**Description**
Prints results table.

**Usage**
```r
## S3 method for class 'likert.gap'
print(x, ...)
```

**Arguments**
- `x` the likert class to print.
- `...` parameters passed to **print.data.frame**.
print.likert.heat.plot

*Print method for* likert.heat.plot.

**Description**

Print method for *likert.heat.plot*.

**Usage**

```r
## S3 method for class 'likert.heat.plot'
print(p, ...)
```

**Arguments**

- `p`: a plot from *likert.heat.plot*.
- `...`: other parameters passed to ggplot2.

print.xlikert *Prints the results of* xtable.likert.

**Description**

Print method for *xtable.likert*.

**Usage**

```r
## S3 method for class 'xlikert'
print(x, tabular.environment = "longtable",
       floating = FALSE, ...)
```

**Arguments**

- `x`: results of *xtable.likert*.
- `tabular.environment`: see *print.xtable*.
- `floating`: see *print.xtable*.
- `...`: other parameters passed to *print.xtable*.
recode  

**R**  

**Recode a vector.**  

**Description**  
This utility function will recode values from an original character or factor vector with new values.  

**Usage**  
recode(x, from, to, to.class = NULL)  

**Arguments**  
- **x**  
  the vector whose values will be recoded.  
- **from**  
  the old values in x to be recoded.  
- **to**  
  the new values.  
- **to.class**  
  an ‘as.’ function representing the desired vector type (i.e. as.character, as.numeric, as.logical, as.numeric).  

**Value**  
a vector with same length of x with recoded values.  

**Examples**  
test <- letters[sample(5, 10, replace=TRUE)]  
recode(test, from=letters[1:5], to=paste('Letter', letters[1:5]))  

**reverse.levels**  

**Reverse the levels of a factor.**  

**Description**  
Reverse the levels of a factor.  

**Usage**  
reverse.levels(x)  

**Arguments**  
- **x**  
  a factor or a data.frame of factors whose levels will be reverse coded.
Examples

mylevels <- c('Strongly Disagree', 'Disagree', 'Neither', 'Agree', 'Strongly Agree')
test <- factor(sample(mylevels[1:5], 10, replace=TRUE))
cbind(test, as.integer(test), as.integer(reverse.levels(test)))

sasr

Results from the Survey of Academic Self-Regulation (SASR).

Description

The Survey of Academic Self-Regulation (SASR) is comprised of six factors: self-regulation, intrinsic motivation, extrinsic motivation, self-efficacy, metacognition, and personal relevance and control.

Format

a data frame with 860 observations of 63 variables.

References


shinyLikert

Shiny App for the likert package.

Description

This will start a shiny app included with the package to show many of the features available in the likert package.

Usage

shinyLikert()

References

http://rstudio.com/shiny
Summary

The `summary` function returns a data frame that provides additional information. It contains 'Item' and 'Group' columns similar to the results data frame as well as a column 'low' corresponding to the sum of levels below neutral, a column 'high' corresponding to the sum of levels above neutral, and columns 'mean' and 'sd' corresponding to the mean and standard deviation, respectively, of the results. The numeric values are determined by `as.numeric` which will use the values of the factors.

Usage

```r
## S3 method for class 'likert'
summary(object, center = (object$nlevels - 1)/2 + 1,
        ordered = TRUE, ...)
```

Arguments

- `object`: the likert class to summarize.
- `center`: specifies which level should be treated as the center. For example, `center = 3` would use the third level as the center whereas `center = 3.5` would indicate no specific level is the center but <= 3 are low levels and >= 4 are high levels (i.e. used for forced choice items or those without a neutral option).
- `ordered`: whether the results should be ordered. Currently unsupported for grouped analysis.
- `...`: currently unused.

Summary.likert.gap

Prints summary table of a Likert analysis.

Description

The `summary` function returns a data frame that provides additional information. It contains 'Item' and 'Group' columns similar to the results data frame as well as a column 'low' corresponding to the sum of levels below neutral, a column 'high' corresponding to the sum of levels above neutral, and columns 'mean' and 'sd' corresponding to the mean and standard deviation, respectively, of the results. The numeric values are determined by `as.numeric` which will use the values of the factors.

Usage

```r
## S3 method for class 'likert.gap'
summary(object, ...)
```
Arguments

object the likert class to summarize.
...
parameters passed to summary.likert

Value

a list with two data frames with summarized data for satisfaction and importance results separately.

---

xtable.likert

Prints a LaTeX table of the likert items.

Description

Create a LaTeX or HTML table of the likert results.

Usage

## S3 method for class 'likert'
xtable(x, caption = NULL, label = NULL, align = NULL,
digits = NULL, display = NULL, auto = FALSE, include.n = TRUE,
include.mean = TRUE, include.sd = TRUE, include.low = TRUE,
include.neutral = (x$nlevels%%2 != 0), include.high = TRUE,
include.levels = TRUE, include.missing = TRUE, center = (x$nlevels -
1)/2 + 1, ordered = TRUE, ...)

Arguments

x likert class object.
caption the table caption.
label the table label.
align column alignments.
digits number of digits to use for numeric columns.
display column formats.
auto Logical, indicating whether to apply automatic format when no value is passed to align, digits, or display (see xtable for more information.
include.n option to include n
include.mean option to include mean
include.sd option to include sd
include.low option to include low
include.neutral option to include neutral
include.high option to include high
include.levels option to include levels
include.missing
  option to include missing levels.

center  specifies which level should be treated as the center. For example, center = 3 would use the third level as the center whereas center = 3.5 would indicate no specific level is the center but <= 3 are low levels and >= 4 are high levels (i.e. used for forced choice items or those without a neutral option). This also influences which levels are summarized in the low and high groups.

ordered  whether the results should be ordered. See summary.likert

...  other parameters passed to xtable.

See Also

xtable, print.xtable
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