Package ‘rciplot’

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Type Package

Title Plot Jacobson-Truax Reliable Change Indices

Version 0.1.1

Description The concept of reliable and clinically significant change
(Jacobson & Truax, 1991) helps you answer the following questions for a
sample with two measurements at different points in time (pre & post):
Which proportion of my sample has a (considering the reliability of the
instrument) probably not-just-by-chance difference in pre- vs. post-scores?
Which proportion of my sample does not only change in a statistically
significant way (see question one), but also in a clinically significant way
(e.g. change from a test score regarded "dysfunctional" to a score regarded
"functional")?
This package allows you to very easily create a scatterplot of your sample
in which the x-axis maps to the pre-scores, the y-axis maps to the
post-scores and several graphical elements (lines, colors) allow you to gain
a quick overview about reliable changes in these scores.
An example of this kind of plot is Figure 2 of Jacobson & Truax (1991).
Referenced article:

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URL https://gitlab.com/REDS1736/rciplot

Encoding UTF-8

LazyData true

Imports dplyr, ggplot2, stats, tibble

RoxygenNote 7.2.2

Depends R (>= 2.10)

NeedsCompilation no

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**Description**

Create a scatterplot of your sample in which the x-axis maps to the pre-scores, the y-axis maps to the post-scores and several graphical elements (lines, colors) allow you to gain a quick overview about reliable changes in these scores. An example of this kind of plot is Figure 2 of Jacobson & Truax (1991). Jacobson-Truax classification (represented in point colors) is always based on ‘recovery_cutoff’, not on any other plotted horizontal line (e.g. mid of means).

**Usage**

```r
ciplot(
  data,
  pre = NULL,
  post = NULL,
  group = NULL,
  reliability = NULL,
  reliable_change_alpha = 0.05,
  recovery_cutoff = NULL,
  classification_method = "recovery cutoff",
  show_classification_counts = TRUE,
  show_classification_percentages = TRUE,
  higher_is_better = TRUE,
  pre_jitter = 0,
  post_jitter = 0,
  opacity = 0.5,
  size_points = 1,
  size_lines = 0.3,
  draw_meanmid_line = FALSE,
  draw_2sd_functional_line = FALSE,
  draw_2sd_dysfunctional_line = FALSE,
  mean_functional = NULL,
  mean_dysfunctional = NULL,
  sd_functional = 1,
  sd_dysfunctional = 1
)
```
### rciplot

#### Arguments

- **data**: Dataframe containing all relevant data
- **pre**: Name of the column in `data` containing pre values
- **post**: Name of the column in `data` containing post values
- **group**: Name of column by which cases are to be grouped (controls shape of scatter plot points)
- **reliability**: Reliability of the used test / instrument
- **reliable_change_alpha**: Probability of alpha error for the calculation of the critical distance which is the minimum pre-post difference to be regarded statistically significant
- **recovery_cutoff**: Test score below which individuals are considered healthy / recovered
- **classification_method**: What cutoff value is to be used to classify individuals into healthy / unhealthy individuals? Possible values: "recovery cutoff" = the so-called function parameter, "mid of means" = the exact numeric mid between the two function parameters mean_functional and mean_dysfunctional, "2 sd dysfunctional" = everybody with a score higher than 2 SD above the dysfunctional group mean is healthy "2 sd functional" = everybody with a score higher than 2 SD below the functional group mean is healthy
- **show_classification_counts**: If TRUE, show number of cases for each classification (e.g. reliable improvement, no reliable change, ...) in legend
- **show_classification_percentages**: Expanding on `show_classification_counts`. If TRUE, show the respective percentage of the whole sample each classification makes up.
- **higher_is_better**: TRUE if higher values indicate a remission / healthy individual. FALSE if higher values indicate worse health.
- **pre_jitter**: Jitter factor to apply to pre values
- **post_jitter**: Jitter factor to apply to post values
- **opacity**: Alpha value of scatter plot points
- **size_points**: Size of scatter plot points.
- **size_lines**: Size (thickness) of lines in plot.
- **draw_meanmid_line**: Draw a horizontal line indicating the middle between the population means for a functional (healthy) population and a dysfunctional (diseased) population, described as criterion *c* in Jacobson & Truax (1991).
- **draw_2sd_functional_line**: Draw a horizontal line indicating a cutoff at a 2 SD distance from 'mean_functional', described as criterion *b* in Jacobson & Truax (1991).
- **draw_2sd_dysfunctional_line**: Draw a horizontal line indicating a cutoff at a 2 SD distance from 'mean_dysfunctional', described as criterion *a* in Jacobson & Truax (1991).
mean_functional
   Required if 'draw_meanmid_line = T' or 'draw_2sd_[dys]functional_line = T'.
   Mean test score of the functional population.

mean_dysfunctional
   Required if 'draw_meanmid_line = T' or 'draw_2sd_[dys]functional_line'.  Mean
   test score of the dysfunctional population.

sd_functional
   Optional for 'draw_meanmid_line = T'.  Standard deviation of the functional
   population.

sd_dysfunctional
   Optional for 'draw_meanmid_line = T'.  Standard deviation of the dysfunctional
   population.

Value

A list containing:

higher_is_better
   Exactly the input parameter higher_is_better

reliable_change
   Pre-Post differences larger than this difference are regarded reliable

plot
   ggplot2 scatter plot analogous to Figure 2 of Jacobson & Truax (1991)

categorization
   List containing categorization of all samples given in data.  Thus, has as many items as data has rows.

Examples

# Using example data from 'sample_data.rda' to recreate Figure 2 of
# Jacobson & Truax (1991):
rciplot(
   data = sample_data,
   pre = 'pre_data',
   post = 'post_data',
   reliability = 0.88,
   recovery_cutoff = 104,
   opacity = 1
)

---

sample_data  
Sample Data from Jacobson & Truax (1991)

Description

This data set is an excerpt from Table 2 of Jacobson & Truax (1991).

Usage

sample_data
**Format**

A CSV table containing the columns ‘ppid’, ‘pre’ and ‘post’ where ‘ppid’ is a continuously incrementing list of unique integers, ‘pre’ contains pretest values (floating-point) and ‘post’ contains posttest values (floating-point too).

**Source**

Table 2 in Jacobson & Truax (1991)

**References**

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