Package 'rciplot'

July 23, 2025

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:
Jacobson, N. S., & Truax, P. (1991) <doi:10.1037/0022-006X.59.1.12>.

License MIT + file LICENSE

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

Author Maximilian Hagspiel [aut, cre, cph]

Maintainer Maximilian Hagspiel <maxhag@mailbox.org>

Repository CRAN

Date/Publication 2023-03-15 09:10:02 UTC

Contents

---

rciplot *rciplot*

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

```
rciplot(
  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
)
```

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-named 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

Jacobson, N. S., & Truax, P. (1991). Clinical Significance: A Statistical Approach to Defining Meaningful Change in Psychotherapy Research. Journal of Consulting and Clinical Psychology, 59, 12-19. <doi:10.1037/0022-006X.59.1.12>

Index