

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:

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

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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

```
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>

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