

# Package ‘CTTvis’

December 17, 2024

**Type** Package

**Title** Visualize Item Metrics of the Classical Test Theory Framework

**Version** 0.1.1

**Description** Visualizes results of item analysis such as item difficulty, item discrimination, and coefficient alpha for ease of result communication.

**License** GPL-3

**URL** <https://github.com/TaridWong/CTTvis>

**Depends** R (>= 4.3)

**Imports** CTT (>= 2.3.3)

**Encoding** UTF-8

**LazyData** true

**RoxygenNote** 7.3.2

**Suggests** knitr, rmarkdown, testthat (>= 3.0.0)

**VignetteBuilder** knitr

**Config/testthat/edition** 3

**NeedsCompilation** no

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**Repository** CRAN

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`coefficient_alpha_plot`*coefficient\_alpha\_visualization*

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## Description

plotting results of coefficient alpha analysis from the Classical test theory framework. Items that increase the overall coefficient alpha when dropped will be shown above the overall alpha line. This helps identifying items that could be revised or removed based on its influence to unidimensional coefficient alpha reliability of the test.

This function can also be used with polytomous item responses. However, it is recommended for users to perform reverse coding as necessary before implementing this function.

## Usage

```
coefficient_alpha_plot(responses, title = "Coefficient Alpha", alpha_round = 3)
```

## Arguments

<code>responses</code>	A dichotomous item response object (a dataframe or a matrix)
<code>title</code>	Title of the plot
<code>alpha_round</code>	Rounding option for coefficient alpha. default to 4 decimal points.

## Value

A data frame sorted by coefficient alpha if dropped in ascending order. A plot of coefficient alpha of each item in relation to the overall coefficient alpha.

## Examples

```
data(reliability_df)

# To plot coefficient alpha with the overall alpha rounding of 3 decimal places

coefficient_alpha_plot(responses = reliability_df,
  title = "Coefficient Alpha Plot", alpha_round = 3)
```

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dichotomous\_response    *dichotomous item responses*

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**Description**

A simulated dataset for dichotomous item responses. Percent correct of responses ranges from 0.2 to 0.95. N = 100. Number of items = 10.

**Usage**

```
data(dichotomous_response)
```

**Format**

An object of class "data.frame"

**References**

This data set was artificially created for the CTTvis package.

**Examples**

```
data(dichotomous_response)
head(dichotomous_response)
```

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difficulty\_plot    *item\_difficulty\_visualization*

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**Description**

plotting results of item difficulty analysis from the Classical test theory framework

**Usage**

```
difficulty_plot(
  responses,
  title = "Item Difficulty",
  easyFlag = 0.9,
  hardFlag = 0.5
)
```

**Arguments**

<code>responses</code>	A dichotomous item response object (a dataframe or a matrix)
<code>title</code>	Title of the plot
<code>easyFlag</code>	threshold of the easy item
<code>hardFlag</code>	threshold of the hard item

**Value**

A data frame sorted by item difficulty in ascending order. A plot of item difficulty in relation to the specified threshold.

**Examples**

```
data(dichotomous_response)

# To plot item difficulty with easyFlag of .9 and hardFlag of .5

difficulty_plot(responses = dichotomous_response,
               title = "Item Difficulty Plot", easyFlag = .90, hardFlag = .50)
```

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`point_biserial_plot`    *point\_biserial\_visualization*

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**Description**

plotting results of item discrimination analysis from the Classical test theory framework

**Usage**

```
point_biserial_plot(
  responses,
  title = "Item Discrimination",
  pBis_threshold = 0.2
)
```

**Arguments**

<code>responses</code>	A dichotomous item response object (a dataframe or a matrix)
<code>title</code>	Title of the plot
<code>pBis_threshold</code>	Threshold of the point-biserial correlation (pBis)

**Value**

A data frame sorted by item discrimination in ascending order. A plot of item discrimination in relation to the specified threshold.

**Examples**

```
data(dichotomous_response)

# To plot item discrimination with pBis threshold of .20.

point_biserial_plot(responses = dichotomous_response,
  title = "Item Discrimination Plot", pBis_threshold = 0.20)
```

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reliability_df	<i>reliability dataframe</i>
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**Description**

A simulated dataset for reliability analysis testing. Each item varies in terms of their influence on the overall reliability if dropped from the test. N = 100. Number of items = 10.

**Usage**

```
data(reliability_df)
```

**Format**

An object of class "data.frame"

**References**

This data set was artificially created for the CTTvis package.

**Examples**

```
data(reliability_df)
head(reliability_df)
```

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