

Package ‘cacc’

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Title Conjunctive Analysis of Case Configurations

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Description A set of functions to conduct Conjunctive Analysis of Case Configurations (CACC) as described in Miethe, Hart, and Regoeczi (2008) <[doi:10.1007/s10940-008-9044-8](https://doi.org/10.1007/s10940-008-9044-8)>, and identify and quantify situational clustering in dominant case configurations as described in Hart (2019) <[doi:10.1177/0011128719866123](https://doi.org/10.1177/0011128719866123)>. Initially conceived as an exploratory technique for multivariate analysis of categorical data, CACC has developed to include formal statistical tests that can be applied in a wide variety of contexts. This technique allows examining composite profiles of different units of analysis in an alternative way to variable-oriented methods.

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Encoding UTF-8

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URL <https://github.com/amoneva/cacc>

BugReports <https://github.com/amoneva/cacc/issues>

Imports dplyr, ggplot2, rlang, stats, tibble, tidyR

Depends R (>= 4.1)

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NeedsCompilation no

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cacc	<i>Conjunctive Analysis of Case Configurations</i>
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Description

Computes a Conjunctive Analysis of Case Configurations (CACC).

Usage

```
cacc(data, ivs, dv)
```

Arguments

data	A data frame or a tibble.
ivs	A vector of names of the independent variables, without quotes. Variables must be categorical, either integer, character, or factor.
dv	Name of the dependent variable, without quotes. Variable must be a dichotomous integer or factor with values 0 (absence) and 1 (presence).

Value

Returns a tibble with the CACC matrix.

References

Miethe, T. D., Hart, T. C., & Regoeczi, W. C. (2008). The Conjunctive Analysis of Case Configurations: An Exploratory Method for Discrete Multivariate Analyses of Crime Data. *Journal of Quantitative Criminology*, 24, 227–241. <https://doi.org/10.1007/s10940-008-9044-8>

Examples

```
cacc(  
  data = onharassment,  
  ivs = c(sex, age, hours, snapchat, instagram, facebook, twitter, name, photos, privacy),  
  dv = rep_victim  
)  
cacc(onharassment, ivs = sex:privacy, dv = rep_victim)  
  
# Syntax with the native R pipe  
onharassment |> cacc(ivs = sex:privacy, dv = rep_victim)
```

`cluster_sci`*Situational Clustering Index*

Description

Computes a Situational Clustering Index (SCI) to quantify the magnitude of the clustering of observations among dominant profiles in a `cacc_matrix`.

Usage

```
cluster_sci(cacc_matrix)
```

Arguments

`cacc_matrix` A tibble. The output of the `cacc` function.

Value

Returns a numeric value.

References

Hart, T. C. (2019). Identifying Situational Clustering and Quantifying Its Magnitude in Dominant Case Configurations: New Methods for Conjunctive Analysis. *Crime & Delinquency*, 66(1), 143-159. <https://doi.org/10.1177/0011128719866123>

Examples

```
cluster_sci(cacc(onharassment, ivs = sex:privacy, dv = rep_victim))
```

cluster_xsq	<i>Chi-Square Goodness-of-Fit Test</i>
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Description

Computes a Chi-Square Goodness-of-Fit Test to determine whether there is statistically significant clustering of observations among dominant profiles in a `cacc_matrix`.

Usage

```
cluster_xsq(cacc_matrix)
```

Arguments

`cacc_matrix` A tibble. The output of the `cacc` function.

Value

Returns a list with the Chi-square results. This is the same object returned by the `chisq.test` function from the `stats` package.

References

Hart, T. C. (2019). Identifying Situational Clustering and Quantifying Its Magnitude in Dominant Case Configurations: New Methods for Conjunctive Analysis. *Crime & Delinquency*, 66(1), 143-159. <https://doi.org/10.1177/0011128719866123>

Examples

```
cluster_xsq(cacc(onharassment, ivs = sex:privacy, dv = rep_victim))
```

main_effect	<i>Main effect</i>
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Description

Computes the main effect that a specific value of a variable produces on the outcome probability in a `cacc_matrix`.

Usage

```
main_effect(cacc_matrix, iv, value, summary = TRUE)
```

Arguments

<code>cacc_matrix</code>	A tibble. The output of the <code>cacc</code> function.
<code>iv</code>	A single variable name contained in a <code>cacc_matrix</code> .
<code>value</code>	A single numeric or character value the <code>iv</code> specified can take.
<code>summary</code>	Logical. Defaults to TRUE. Whether or not to return the summary statistics for the main effect.

Value

When `summary = TRUE`, returns a tibble with summary stats for the main effect. If `summary = FALSE`, returns a tibble containing a single numeric variable, ranging from 0 to 1, containing the main effects of the value of the selected `iv` on the probability of outcome.

References

Hart, T. C., Rennison, C. M., & Miethe, T. D. (2017). Identifying Patterns of Situational Clustering and Contextual Variability in Criminological Data: An Overview of Conjunctive Analysis of Case Configurations. *Journal of Contemporary Criminal Justice*, 33(2), 112–120. <https://doi.org/10.1177/1043986216689746>

Examples

```
main_effect(
  cacc_matrix = cacc(onharassment, ivs = sex:privacy, dv = rep_victim),
  iv = age,
  value = "15-17"
)
main_effect(
  cacc_matrix = cacc(onharassment, ivs = sex:privacy, dv = rep_victim),
  iv = age,
  value = "15-17",
  summary = FALSE
)
```

onharassment

Profiles of 4174 Spanish students

Description

A dataset containing the demographics, online routines, and self-reported online harassment repeat victimization and offending of 4174 Spanish non-university education students.

Usage

```
onharassment
```

Format

A data frame with 4174 rows and 12 variables:

sex Factor. The students' self-reported sex.

age Factor. The students' self-reported age

hours Factor. The students' self-reported number of daily hours spent online.

snapchat Factor. Whether students report using the social media Snapchat on a daily basis.

instagram Factor. Whether students report using the social media Instagram on a daily basis.

facebook Factor. Whether students report using the social media Facebook on a daily basis.

twitter Factor. Whether students report using the social media Twitter on a daily basis.

name Factor. Whether students report using their real names on social media.

photos Factor. Whether students report uploading personal photos to social media.

privacy Factor. Whether students report restricting their social media access to contacts only.

rep_victim Factor. Whether students report repeatedly suffering online harassment.

rep_offender Factor. Whether students report repeatedly committing online harassment.

Source

Moneva, A., Miró-Llinares, F., & Hart, T. C. (2021). Hunter or Prey? Exploring the situational profiles that define repeated online harassment victims and offenders. *Deviant Behavior*, 42(11), 1366-1381. <https://doi.org/10.1080/01639625.2020.1746135>

plot_effect

Density Plot for the Main Effect

Description

Plots an annotated boxplot and kernel density estimate to visualize the distribution of the main effect that a specific value of a variable produces on the outcome probability in a `cacc_matrix`.

Usage

```
plot_effect(cacc_matrix, iv, value)
```

Arguments

`cacc_matrix` A tibble. The output of the `cacc` function.

`iv` A single variable name contained in a `cacc_matrix`.

`value` A single numeric or character value the `iv` specified can take.

Value

Returns a ggplot object.

References

Hart, T. C., Rennison, C. M., & Miethe, T. D. (2017). Identifying Patterns of Situational Clustering and Contextual Variability in Criminological Data: An Overview of Conjunctive Analysis of Case Configurations. *Journal of Contemporary Criminal Justice*, 33(2), 112–120. <https://doi.org/10.1177/1043986216689746>

Examples

```
plot_effect(  
  cacc_matrix = cacc(onharassment, ivs = sex:privacy, dv = rep_victim),  
  iv = age,  
  value = "15-17"  
)
```

plot_sci

Lorenz Curve for the Situational Clustering Index

Description

Plots a Lorenz Curve for the Situational Clustering Index (SCI) to visualize the magnitude of the clustering of observations among dominant profiles in a `cacc_matrix`.

Usage

```
plot_sci(cacc_matrix)
```

Arguments

`cacc_matrix` A tibble. The output of the `cacc` function.

Value

Returns a ggplot object.

References

Hart, T. C. (2019). Identifying Situational Clustering and Quantifying Its Magnitude in Dominant Case Configurations: New Methods for Conjunctive Analysis. *Crime & Delinquency*, 66(1), 143-159.

Examples

```
plot_sci(cacc_matrix = cacc(onharassment, ivs = sex:privacy, dv = rep_victim))
```

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