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>, and identify and quantify situational clustering in dominant case configurations as described in Hart (2019) <doi: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

RoxygenNote 7.2.1

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

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

Imports dplyr, ggplot2, rlang, stats, tibble, tidyr

Depends R (>= 4.1)

LazyData true

NeedsCompilation no

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Contents

`cacc` *Conjunctive Analysis of Case Configurations*

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 *Chi-Square Goodness-of-Fit Test*

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 *Main effect*

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

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.
summary	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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