Package 'DyadRatios'

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Type Package

Title Dyad Ratios Algorithm

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Description

Estimates the Dyad Ratios Algorithm for pooling and smoothing poll estimates. The Dyad Ratios Algorithm smooths both forward and backward in time over polling results allowing differences in both question type and polling house. The result is an estimate of a single latent variable that describes the systematic trend over time in the (noisy) polling results. See James A. Stimson (2018) <doi:10.1177/0759106318761614> and the package's vignette for more details.

Depends R (>= 3.5.0)

Imports ggplot2, lubridate, stats

License GPL (>= 2)

Encoding UTF-8

Suggests dplyr, rio, knitr, rmarkdown

VignetteBuilder knitr

RoxygenNote 7.3.2

NeedsCompilation no

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Repository CRAN

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extract   *Dyad Ratios Algorithm*

Description

Estimates the Dyad Ratios Algorithm for constructing latent time series from survey-research marginals.

Arguments

varname	String giving the name of the input series to be smoothed. This should identify similar or comparable values in the series. Values in the series that have the same varname will be assumed to come from the same source.
date	ISO numeric representation of the date the survey was in the field (usually the start, end, or median date).
index	Numeric value of the series. It might be a percent or proportion responding in a single category (e.g., the approve response in presidential approval) or some multi-response summary. For ease of interpretation, polarity should be the same for all items.
ncases	Number of cases (e.g., sample size) of the survey. This provides differential weighting for the values. Setting this to NULL or leaving it blank will weight each value equally.
unit	Aggregation period—one of 'D' (daily), 'M' (monthly), 'Q' (quarterly), 'A' (annual), or 'O' (multi-year aggregation).
mult	Number of years, only used if unit is 'O'.
begindt	Beginning date of the analysis. Defaults to earliest date in the dataset. Should be specified with lubridate::ymd().
enddt	Ending date for the analysis. Defaults to the latest date in the data.
npass	Not yet implemented.
smoothing	Logical. Specifies whether exponential smoothing is applied to the intermediate estimates during the iterative solution process. Defaults to TRUE.
endmonth	Ending month of the analysis.

Value

A list with components:

- call: The initial call to 'extract()'.
- T: Number of aggregation periods.
- nvar: Number of series used in the analysis.
- unit: The aggregation period.
- dimensions: Number of dimensions estimated (1 or 2).
- period: List of aggregation periods.

- `varname`: List in order of the variables used in the analysis.

- `N`: Number of non-missing observations for each series.

- `means`: Item descriptive information.

- `std.deviations`: Item descriptive information.

- `setup1`: Basic information about the options and iterative solution for the first dimension.

- `setup2`: Basic information about the options and iterative solution for the second dimension, if applicable.

- `loadings1`: Item–scale correlations from the first dimension of the final solution. Their square is the validity estimate used in weighting.

- `loadings2`: Item–scale correlations from the second dimension of the final solution, if applicable.

- `latent1`: Estimated time series for first dimension.

- `latent2`: Estimated time series for second dimension, if applicable.

- `hist`: Data frame with iteration history, including convergence statistics.

- `totalvar`: Total variance in the data that could be explained by the estimated dimensions.

- `var_exp`: Data frame with variance explained and proportion of variance explained for each dimension.

- `dropped`: Data frame listing any series that were dropped from the analysis due to insufficient data.

- `smoothing`: Logical indicating whether smoothing was applied during the iterative solution process.

References

Stimson, J. A. (2018). 'The Dyad Ratios Algorithm for Estimating Latent Public Opinion: Estimation, Testing, and Comparison to Other Approaches', *Bulletin of Sociological Methodology/Bulletin de Méthodologie Sociologique*, 137–138(1), 201–218. doi:10.1177/0759106318761614

Examples

```
data(jennings)
dr_out <- extract(varname = jennings$variable,
                  date = jennings$date,
                  index = jennings$value,
                  ncases = jennings$n,
                  begindt = min(jennings$date),
                  enddt = max(jennings$date),
                  npass=1)
summary(dr_out)
```

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get_mood   *Get Mood Estimates from Dyad Ratios Algorithm*

Description

Retrieve the latent variable estimates from the dyad ratios algorithm produced by the 'extract()' function.

Arguments

out   An object of class "extract", typically a result of the 'extract()' function.

...   Other arguments to be passed down (currently unused).

Value

A data frame containing the period of aggregation and the corresponding latent variable estimates for each dimension.

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jennings   *Jennings Government Trust Data*

Description

A dataset of survey marginals from the British Social Attitudes (BSA) survey, measuring public trust in government. These marginals are commonly used as input to the Dyad Ratios Algorithm for constructing latent time series. We replaced missing sample sizes with a value of 850, which is roughly the minimum sample size observed in the data.

Format

A data frame with 4 variables and 'r nrow(jennings)' rows:

variable Character string identifying the survey question or series.

date Date the survey was fielded.

value percentage of people indicating distrust in the government.

n Sample size for the survey wave.

Source

Jennings, W. N. Clarke, J. Moss and G. Stoker (2017). "The Decline in Diffuse Support for National Politics: The Long View on Political Discontent in Britain" In *Public Opinion Quarterly*, 81(3), 748-758. doi:10.1093/poq/nfx020

Examples

```
data(jennings)
head(jennings)
```

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plot.extract *Plot Method for the extract Function.*

Description

This function generates a line plot of the latent variable estimates obtained from the 'extract()' function. It can handle both one-dimensional and two-dimensional latent variable estimates.

Arguments

x   An object of class "extract", typically a result of the 'extract()' function.

...   Additional graphical parameters to be passed to the plot function.

Value

A ggplot of the latent variable estimate(s) over time.

Examples

```
data(jennings)
dr_out <- extract(varname = jennings$variable,
                  date = jennings$date,
                  index = jennings$value,
                  ncases = jennings$n,
                  begindt = min(jennings$date),
                  enddt = max(jennings$date),
                  npass=1)
plot(dr_out)
```

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print.extract *Print method for extract function*

Description

Print method for extract function

Arguments

x   An object of class "extract", typically a result of the extract function.

...   Other arguments to be pased down

Value

A printed summary of the output from the extract function and the input object returned invisbly.

Examples

```
data(jennings)
dr_out <- extract(varname = jennings$variable,
                  date = jennings$date,
                  index = jennings$value,
                  ncases = jennings$n,
                  begindt = min(jennings$date),
                  enddt = max(jennings$date),
                  npass=1)
print(dr_out)
```

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summary.extract   *Summary Method for extract Objects*

Description

Prints a summary from objects estimated with the the extract function.

Arguments

object	An object of class "extract", typically a result of the extract function.
...	Other arguments to be passed down (currently unused).

Value

Printed output of variable loadings and descriptive information.

Examples

```
data(jennings)
dr_out <- extract(varname = jennings$variable,
                  date = jennings$date,
                  index = jennings$value,
                  ncases = jennings$n,
                  begindt = min(jennings$date),
                  enddt = max(jennings$date),
                  npass=1)
summary(dr_out)
```

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