Package ‘DCPO’

October 12, 2022

Version 0.5.3
Title Dynamic Comparative Public Opinion
Description Estimates latent variables of public opinion cross-nationally and over time from sparse and incomparable survey data. 'DCPO' uses a population-level graded response model with country-specific item bias terms. Sampling is conducted with 'Stan'. References: Solt (2020) <doi:10.31235/osf.io/d5n9p>.
License GPL (>= 3)
Encoding UTF-8
LazyData true
ByteCompile true
Depends R (>= 3.4.0), Rcpp (>= 0.12.17), methods
Imports rstan (>= 2.18.1), rstantools (>= 2.0.0), beeper, dplyr, forcats, janitor, purrr, tibble, tidyr
LinkingTo StanHeaders (>= 2.18.0), rstan (>= 2.18.1), BH (>= 1.66.0-1), Rcpp (>= 0.12.0), RcppEigen (>= 0.3.3.4.0)
Suggests knitr
SystemRequirements GNU make
NeedsCompilation yes
RoxygenNote 7.0.0
Biarch true
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Repository CRAN
Date/Publication 2020-05-29 12:50:02 UTC

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DCPO-package

DCPO: Dynamic Comparative Public Opinion

Description

DCPO estimates dynamic comparative public opinion as a latent variable from survey data.

References


dcpo

Estimate Dynamic Comparative Public Opinion

Description

dcpo uses diverse survey data to estimate public opinion across countries and over time.

Usage

dcpo(dcpo_input, chime = TRUE, ...)

Arguments

dcpo_input  a data frame of survey items and marginals generated by DCPOtools::dcpo_setup
chime       play chime when complete?
...          arguments to be passed to rstan::stan. Defaults reset by dcpo are described below under details.

Details

dcpo, when passed a data frame dcpo_input of survey marginals created by dcpo_setup, estimates a latent variable of public opinion. See rstan::stan for additional options; stan defaults reset by dcpo are seed = 324, thin = 2, cores = min(stan_args$chains, parallel::detectCores()/2), and control <- list(adapt_delta = 0.99, stepsize = 0.005, max_treedepth = 14)

Value

a stanfit object
Examples

```r
out1 <- dcpo(demsup_data,
  chains = 1,
  iter = 300) # 1 chain/300 iterations for example purposes only; use defaults
```

**dcpo_xvt**

Cross-validation testing for DCPO

**Description**

dcpo_xvt performs a single cross-validation test for DCPO

**Usage**

```r
dcpo_xvt(
  dcpo_input,
  fold_number = 1,
  number_of_folds = 10,
  fold_seed = 324,
  chime = TRUE,
  ...
)
```

**Arguments**

- **dcpo_input**: a data frame of survey items and marginals generated by DCPOtools::dcpo_setup
- **fold_number**: an integer indicating the number of the fold to treated as test data in the current analysis
- **number_of_folds**: an integer indicating the total number of folds
- **fold_seed**: a seed for reproducibly randomly assigning observations to folds; when a complete set of k-fold cross-validations is to be performed, the same seed should be used for all
- **chime**: play chime when complete?
- **...**: arguments to be passed to rstan::stan. See dcpo.

**Details**

dcpo_xvt performs a single cross-validation test of a DCPO estimation. To perform a complete k-fold cross-validation, call it repeatedly, changing only the fold_number argument.

**Value**

a stanfit object
demsup_data

Examples

# Single cross-validation test with 25% test set
demsup_xvtest_25pct <- dcpo_xvt(demsup_data,
    number_of_folds = 4,
    iter = 300,
    chains = 1) # 1 chain/300 iterations for example only; use defaults

---

demsup_data

Support for Democracy in 51 Survey Datasets

Description

A dataset containing the prices and other attributes of almost 54,000 diamonds.

Usage

demsup_data

Format

A list of 15 elements

- **K** an integer, the total number of countries in the data
- **T** an integer, the total number of years in the data
- **Q** an integer, the total number of distinct survey questions in the data
- **R** an integer, the maximum number of response cutpoints in any survey question in the data
- **N** an integer, the number of KTQR observations
- **kk** a numeric vector of length N, the country of each observation
- **tt** a numeric vector of length N, the year of each observation
- **qq** a numeric vector of length N, the question of each observation
- **rr** a numeric vector of length N, the response cutpoint of each observation
- **y_r** a numeric vector of length N, the number of respondents who provided a response above the relevant cutpoint for each observation
- **n_r** a numeric vector of length N, the total number of respondents for each observation
- **fixed_cutp** a QxR matrix, a truth table indicating the question-cutpoint to be fixed at difficulty .5
- **use_delta** a QxK tibble, a truth table indicating whether item difficulty should be estimated to vary by question-country to account for potential item-response bias
- **data** an Nx14 tibble, the aggregate survey response dataset in its original format
- **data_args** a list of length 3, indicating the arguments passed to DCPOtools::format_dcpo to generate demsup_data from demsup_data$data
get_xvt_results

Details

Data on aggregate support for democracy reported in 51 survey datasets in 998 country-years, formatted for use with the functions of the DCPO package.

Source


---

get_xvt_results

Get results of DCPO cross-validation testing

Description

geret_xvt_results performs a single cross-validation test for dcpo's estimates of cross-national public opinion

Usage

geret_xvt_results(dcpo_xvt_output, ci = 80)

Arguments

dcpo_xvt_output
output from a single call to DCP0::dcpo_xvt or a k-fold test list of such output generated by purrr::map

ci
an integer indicating the desired width of credible interval for coverage testing; 80 is the default.

Value

a stanfit object

Examples

# Single cross-validation test with 25% test set
demsup_xvtest_25pct <- dcpo_xvt(demsup_data,
  chime = FALSE,
  number_of_folds = 4,
  iter = 300,
  chains = 1) # 1 chain/300 iterations for example only; use defaults
geret_xvt_results(demsup_xvtest_25pct)
**summarize_dcpo_results**

*Extract DCPO Results*

**Description**

`summarize_dcpo_results` is a convenience function that produces summary statistics of the main parameters of a DCPO stanfit object along with the relevant identifying information (country, year, question, and cutpoint).

**Usage**

```r
summarize_dcpo_results(
  dcpo_input,
  dcpo_output,
  pars = c("theta", "sigma", "alpha", "beta", "delta"),
  probs = c(0.1, 0.9)
)
```

**Arguments**

- **dcpo_input**: the data frame of survey items and marginals generated by `DCPOtools::dcpo_setup` previously passed to `DCPO::dcpo` to generate the stanfit object passed as `dcpo_output`
- **dcpo_output**: a stanfit object output by `DCPO::dcpo`
- **pars**: a character vector of parameter names to be summarized from the `DCPO` model: theta (mean public opinion), sigma (polarization in public opinion), alpha (question dispersion), beta (question-cutpoint difficulty), and/or delta (country-specific question bias)
- **probs**: a numeric vector of quantiles of interest; the default is `c(.1,.9)`

**Value**

a tibble

**Examples**

```r
out1 <- dcpo(demsup_data,
  chime = FALSE,
  chains = 1,
  iter = 300) # 1 chain/300 iterations for example purposes only; use defaults

theta_results <- summarize_dcpo_results(dcpo_input = demsup_data,
  dcpo_output = out1,
  pars = "theta")
```
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