

# Package ‘tidytreatment’

July 22, 2025

**Type** Package

**Title** Tidy Methods for Bayesian Treatment Effect Models

**Version** 0.3.1

**Description** Functions for extracting tidy data from Bayesian treatment effect models, in particular BART, but extensions are possible. Functionality includes extracting tidy posterior summaries as in ‘tidybayes’ <<https://github.com/mjskay/tidybayes>>, estimating (average) treatment effects, common support calculations, and plotting useful summaries of these.

**Encoding** UTF-8

**LazyData** true

**License** MIT + file LICENSE

**URL** <https://github.com/bonStats/tidytreatment>

**BugReports** <https://github.com/bonStats/tidytreatment/issues>

**Language** en-US

**Depends** R (>= 3.1.0)

**Suggests** knitr, rmarkdown, stan4bart, bartCause, ggplot2, testthat (>= 3.0.0), withr, lme4

**VignetteBuilder** knitr

**RoxygenNote** 7.3.2

**Imports** tidybayes, purrr, tidyr, dplyr, readr, rlang, dbarts, BART, coda, magrittr

**Enhances** bartMachine

**Config/testthat/edition** 3

**NeedsCompilation** no

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**Repository** CRAN

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---

avg\_treatment\_effects *Get (conditional) average treatment effect draws from posterior*

---

## Description

(C)ATE = (Conditional) Average Treatment Effects newdata specifies the conditions, if unspecified it defaults to the original data. Assumes treated column is either a integer column of 1's (treated) and 0's (nontreated) or logical indicating treatment if TRUE.

## Usage

```
avg_treatment_effects(
  model,
  treatment,
  newdata,
  subset = "all",
  common_support_method,
  cutoff,
  ...
)
```

## Arguments

|                       |                                                                                                    |
|-----------------------|----------------------------------------------------------------------------------------------------|
| model                 | A supported Bayesian model fit that can provide fits and predictions.                              |
| treatment             | A character string specifying the name of the treatment variable.                                  |
| newdata               | Data frame to generate fitted values from. If omitted, defaults to the data used to fit the model. |
| subset                | Either "treated", "nontreated", or "all". Default is "all".                                        |
| common_support_method | Either "sd", or "chisq". Default is unspecified, and no common support calculation is done.        |
| cutoff                | Cutoff for common support (if in use).                                                             |
| ...                   | Arguments to be passed to tidybayes::fitted_draws typically scale for BART models.                 |

## Value

A tidy data frame (tibble) with treatment effect values.

---

`bartmodel1`*Example model 1*

---

**Description**

Model fit with simulated data from simulated dataset suhillsim1.

**Usage**

```
bartmodel1
```

**Format**

Object of type `BART::wbart`

**Details**

Propensity score estimated and included suhillsim1 for fitting the model.

**Source**

<https://github.com/bonStats/tidytreatment/tree/master/data-raw>

---

`bartmodel1_modelmatrix`*Model matrix used for bartmodel1*

---

**Description**

Useful for testing tidytreatment package functions.

**Usage**

```
bartmodel1_modelmatrix
```

**Format**

Object of type `BART::wbart`

**Source**

<https://github.com/bonStats/tidytreatment/tree/master/data-raw>

---

|                      |                                             |
|----------------------|---------------------------------------------|
| covariate_importance | <i>Counts of variable overall inclusion</i> |
|----------------------|---------------------------------------------|

---

**Description**

Inclusion metric for bartMachine and BART are scaled differently. bartMachine averaged over number of trees, in addition to number of MCMC draws.

**Usage**

```
covariate_importance(model, ...)
```

**Arguments**

|       |                                          |
|-------|------------------------------------------|
| model | Model                                    |
| ...   | Arguments to pass to particular methods. |

**Value**

Tidy data with counts of variable inclusion, when interacting with treatment variable.

---

|                                     |                                                                     |
|-------------------------------------|---------------------------------------------------------------------|
| covariate_with_treatment_importance | <i>Counts of variable inclusion when interacting with treatment</i> |
|-------------------------------------|---------------------------------------------------------------------|

---

**Description**

Counts of variable inclusion when interacting with treatment

**Usage**

```
covariate_with_treatment_importance(model, treatment, ...)
```

**Arguments**

|           |                                                                   |
|-----------|-------------------------------------------------------------------|
| model     | Model                                                             |
| treatment | A character string specifying the name of the treatment variable. |
| ...       | Arguments to pass to particular methods.                          |

**Value**

Tidy data with counts of variable inclusion, when interacting with treatment variable.

---

|                      |                                                                                  |
|----------------------|----------------------------------------------------------------------------------|
| epred_draws.bartcFit | <i>Get expected prediction draws from posterior of bartCause-package objects</i> |
|----------------------|----------------------------------------------------------------------------------|

---

### Description

Typically referred to as fitted value draws on response scale, where appropriate.

### Usage

```
## S3 method for class 'bartcFit'
epred_draws(
  object,
  ...,
  value = ".epred",
  re_formula = NULL,
  fitstage = c("response", "assignment")
)
```

### Arguments

|            |                                                                                                             |
|------------|-------------------------------------------------------------------------------------------------------------|
| object     | A bartCauseFit object.                                                                                      |
| ...        | Additional arguments (e.g. newdata) passed to the underlying prediction method for the type of model given. |
| value      | The name of the output column.                                                                              |
| re_formula | If NULL (default), include all group-level effects; if NA, include no group-level effects.                  |
| fitstage   | If is.null(type), return posterior from response or treatment assignment model.                             |

---

|                          |                                                                                 |
|--------------------------|---------------------------------------------------------------------------------|
| epred_draws.stan4bartFit | <i>Get expected prediction draws from posterior of stan4bart-package models</i> |
|--------------------------|---------------------------------------------------------------------------------|

---

### Description

Typically referred to as fitted value draws on response scale, where appropriate.

### Usage

```
## S3 method for class 'stan4bartFit'
epred_draws(object, newdata, ..., value = ".epred", re_formula = NULL)
```

**Arguments**

|            |                                                                                              |
|------------|----------------------------------------------------------------------------------------------|
| object     | A stan4bartFit object.                                                                       |
| newdata    | Data frame to generate predictions from [optional].                                          |
| ...        | Additional arguments passed to the underlying prediction method for the type of model given. |
| value      | The name of the output column.                                                               |
| re_formula | If NULL (default), include all group-level effects; if NA, include no group-level effects.   |

---

fitted\_draws.bartMachine

*Get fitted draws from posterior of bartMachine model*


---

**Description**

Get fitted draws from posterior of bartMachine model

**Usage**

```
## S3 method for class 'bartMachine'
fitted_draws(
  model,
  newdata,
  value = ".value",
  ...,
  n = NULL,
  include_newdata = TRUE,
  include_sigsqs = FALSE
)
```

**Arguments**

|                 |                                                                                                    |
|-----------------|----------------------------------------------------------------------------------------------------|
| model           | A bartMachine model.                                                                               |
| newdata         | Data frame to generate fitted values from. If omitted, defaults to the data used to fit the model. |
| value           | The name of the output column for fitted_draws; default ".value".                                  |
| ...             | Not currently in use.                                                                              |
| n               | Not currently implemented.                                                                         |
| include_newdata | Should the newdata be included in the tibble?                                                      |
| include_sigsqs  | Should the posterior sigma-squared draw be included?                                               |

**Value**

A tidy data frame (tibble) with fitted values.

---

|                    |                                                       |
|--------------------|-------------------------------------------------------|
| fitted_draws.lbart | <i>Get fitted draws from posterior of lbart model</i> |
|--------------------|-------------------------------------------------------|

---

## Description

Get fitted draws from posterior of lbart model

## Usage

```
## S3 method for class 'lbart'
fitted_draws(
  model,
  newdata,
  value = ".value",
  ...,
  n = NULL,
  include_newdata = TRUE,
  include_sigsqs = FALSE
)
```

## Arguments

|                 |                                                                                                    |
|-----------------|----------------------------------------------------------------------------------------------------|
| model           | A model from BART package.                                                                         |
| newdata         | Data frame to generate fitted values from. If omitted, defaults to the data used to fit the model. |
| value           | The name of the output column for fitted_draws; default ".value".                                  |
| ...             | Not currently in use.                                                                              |
| n               | Not currently implemented.                                                                         |
| include_newdata | Should the newdata be included in the tibble?                                                      |
| include_sigsqs  | Should the posterior sigma-squared draw be included?                                               |

## Value

A tidy data frame (tibble) with fitted values.

---

|                    |                                                       |
|--------------------|-------------------------------------------------------|
| fitted_draws.mbart | <i>Get fitted draws from posterior of mbart model</i> |
|--------------------|-------------------------------------------------------|

---

## Description

Get fitted draws from posterior of mbart model

## Usage

```
## S3 method for class 'mbart'
fitted_draws(
  model,
  newdata,
  value = ".value",
  ...,
  n = NULL,
  include_newdata = TRUE,
  include_sigsqs = FALSE
)
```

## Arguments

|                 |                                                                                                    |
|-----------------|----------------------------------------------------------------------------------------------------|
| model           | A model from BART package.                                                                         |
| newdata         | Data frame to generate fitted values from. If omitted, defaults to the data used to fit the model. |
| value           | The name of the output column for fitted_draws; default ".value".                                  |
| ...             | Not currently in use.                                                                              |
| n               | Not currently implemented.                                                                         |
| include_newdata | Should the newdata be included in the tibble?                                                      |
| include_sigsqs  | Should the posterior sigma-squared draw be included?                                               |

## Value

A tidy data frame (tibble) with fitted values.

---

|                     |                                                        |
|---------------------|--------------------------------------------------------|
| fitted_draws.mbart2 | <i>Get fitted draws from posterior of mbart2 model</i> |
|---------------------|--------------------------------------------------------|

---

## Description

Get fitted draws from posterior of mbart2 model

## Usage

```
## S3 method for class 'mbart2'
fitted_draws(
  model,
  newdata,
  value = ".value",
  ...,
  n = NULL,
  include_newdata = TRUE,
  include_sigsqs = FALSE
)
```

## Arguments

|                 |                                                                                                    |
|-----------------|----------------------------------------------------------------------------------------------------|
| model           | A model from BART package.                                                                         |
| newdata         | Data frame to generate fitted values from. If omitted, defaults to the data used to fit the model. |
| value           | The name of the output column for fitted_draws; default ".value".                                  |
| ...             | Not currently in use.                                                                              |
| n               | Not currently implemented.                                                                         |
| include_newdata | Should the newdata be included in the tibble?                                                      |
| include_sigsqs  | Should the posterior sigma-squared draw be included?                                               |

## Value

A tidy data frame (tibble) with fitted values.

---

|                    |                                                       |
|--------------------|-------------------------------------------------------|
| fitted_draws.pbart | <i>Get fitted draws from posterior of pbart model</i> |
|--------------------|-------------------------------------------------------|

---

## Description

Get fitted draws from posterior of pbart model

## Usage

```
## S3 method for class 'pbart'
fitted_draws(
  model,
  newdata,
  value = ".value",
  ...,
  n = NULL,
  include_newdata = TRUE,
  include_sigsqs = FALSE
)
```

## Arguments

|                 |                                                                                                    |
|-----------------|----------------------------------------------------------------------------------------------------|
| model           | A model from BART package.                                                                         |
| newdata         | Data frame to generate fitted values from. If omitted, defaults to the data used to fit the model. |
| value           | The name of the output column for fitted_draws; default ".value".                                  |
| ...             | Not currently in use.                                                                              |
| n               | Not currently implemented.                                                                         |
| include_newdata | Should the newdata be included in the tibble?                                                      |
| include_sigsqs  | Should the posterior sigma-squared draw be included?                                               |

## Value

A tidy data frame (tibble) with fitted values.

---

|                    |                                                       |
|--------------------|-------------------------------------------------------|
| fitted_draws.wbart | <i>Get fitted draws from posterior of wbart model</i> |
|--------------------|-------------------------------------------------------|

---

## Description

Get fitted draws from posterior of wbart model

## Usage

```
## S3 method for class 'wbart'
fitted_draws(
  model,
  newdata,
  value = ".value",
  ...,
  n = NULL,
  include_newdata = TRUE,
  include_sigsqs = FALSE
)
```

## Arguments

|                 |                                                                                                    |
|-----------------|----------------------------------------------------------------------------------------------------|
| model           | A model from BART package.                                                                         |
| newdata         | Data frame to generate fitted values from. If omitted, defaults to the data used to fit the model. |
| value           | The name of the output column for fitted_draws; default ".value".                                  |
| ...             | Not currently in use.                                                                              |
| n               | Not currently implemented.                                                                         |
| include_newdata | Should the newdata be included in the tibble?                                                      |
| include_sigsqs  | Should the posterior sigma-squared draw be included?                                               |

## Value

A tidy data frame (tibble) with fitted values.

---

|                   |                                                               |
|-------------------|---------------------------------------------------------------|
| fitted_draws_BART | <i>Get fitted draws from posterior of BART-package models</i> |
|-------------------|---------------------------------------------------------------|

---

**Description**

Get fitted draws from posterior of BART-package models

**Usage**

```
fitted_draws_BART(
  model,
  newdata = NULL,
  value = ".value",
  ...,
  include_newdata = TRUE,
  include_sigsqs = FALSE,
  scale = "real"
)
```

**Arguments**

|                 |                                                                                                    |
|-----------------|----------------------------------------------------------------------------------------------------|
| model           | A model from BART package.                                                                         |
| newdata         | Data frame to generate fitted values from. If omitted, defaults to the data used to fit the model. |
| value           | The name of the output column for fitted_draws; default ".value".                                  |
| ...             | Arguments to pass to predict (e.g. BART::predict.wbart).                                           |
| include_newdata | Should the newdata be included in the tibble?                                                      |
| include_sigsqs  | Should the posterior sigma-squared draw be included?                                               |
| scale           | Should the fitted values be on the real, probit or logit scale?                                    |

**Value**

A tidy data frame (tibble) with fitted values.

---

|                    |                                                      |
|--------------------|------------------------------------------------------|
| has_common_support | <i>Evaluate if observations have common support.</i> |
|--------------------|------------------------------------------------------|

---

**Description**

The common support identification methods are based on Hill and Su (2013). Loosely speaker, an individuals treatment effect estimate has common support if the counter factual estimate is not too uncertain. The estimates are uncertain when the prediction is 'far away' from other observations. Removing estimates without common support can be beneficial for treat effect estimates.

**Usage**

```
has_common_support(model, treatment, method, cutoff, modeldata = NULL)
```

**Arguments**

|           |                                                                       |
|-----------|-----------------------------------------------------------------------|
| model     | A supported Bayesian model fit that can provide fits and predictions. |
| treatment | A character string specifying the name of the treatment variable.     |
| method    | Method to use in determining common support. 'chisq', or 'sd'.        |
| cutoff    | Cutoff point to use for method.                                       |
| modeldata | Manually provide model data for some models (e.g. from BART package)  |

**Details**

Hill, Jennifer; Su, Yu-Sung. Ann. Appl. Stat. 7 (2013), no. 3, 1386–1420. doi:10.1214/13-AOAS630. <https://projecteuclid.org/euclid.aoas/1380804800>

**Value**

Tibble with a row for each observation and a column indicating whether common support exists.

---

```
has_tidyreatment_methods
```

*Check if a model class has required generic methods for tidyreatment functions.*

---

**Description**

Check if a model class has required generic methods for tidyreatment functions.

**Usage**

```
has_tidyreatment_methods(model)
```

**Arguments**

|       |                      |
|-------|----------------------|
| model | Model to be checked. |
|-------|----------------------|

**Value**

Boolean

---

highDim\_testdataset3    *ACIC2019 High Dimensional Test Dataset*

---

### Description

Dataset from the "Data Challenge" for the Atlantic Causal Inference Conference 2019.

### Usage

```
highDim_testdataset3
```

### Format

A data frame with 2000 observations, and 187 variables.

**Y** Outcome variable

**A** Treatment variable

**V1,V2,V3,V4,V5,V6,V7,V8,V9,V10,V11,V12,V13,V14,V15,V16,V17,V18,V19,V20,V21,V22,V23,V24,V25,V26,V27,V28,V29,V30,V31,V32,V33,V34,V35,V36,V37,V38,V39,V40,V41,V42,V43,V44,V45,V46,V47,V48,V49,V50,V51,V52,V53,V54,V55,V56,V57,V58,V59,V60,V61,V62,V63,V64,V65,V66,V67,V68,V69,V70,V71,V72,V73,V74,V75,V76,V77,V78,V79,V80,V81,V82,V83,V84,V85,V86,V87,V88,V89,V90,V91,V92,V93,V94,V95,V96,V97,V98,V99,V100,V101,V102,V103,V104,V105,V106,V107,V108,V109,V110,V111,V112,V113,V114,V115,V116,V117,V118,V119,V120,V121,V122,V123,V124,V125,V126,V127,V128,V129,V130,V131,V132,V133,V134,V135,V136,V137,V138,V139,V140,V141,V142,V143,V144,V145,V146,V147,V148,V149,V150,V151,V152,V153,V154,V155,V156,V157,V158,V159,V160,V161,V162,V163,V164,V165,V166,V167,V168,V169,V170,V171,V172,V173,V174,V175,V176,V177,V178,V179,V180,V181,V182,V183,V184,V185,V186,V187** Other covariates ...

### Source

<https://www.mcgill.ca/epi-biostat-occh/seminars-events/event-archive/atlantic-causal-inference-conference-2019/data-challenge>

---

```
linpred_draws.bartcFit
```

*Get expected prediction draws (on linear scale) from posterior of  
bartCause-package objects*

---

### Description

Typically referred to as fitted value draws on linear scale, where appropriate.

### Usage

```
## S3 method for class 'bartcFit'
linpred_draws(
  object,
  ...,
  value = ".linpred",
  re_formula = NULL,
  fitstage = c("response", "assignment")
)
```

**Arguments**

|            |                                                                                                             |
|------------|-------------------------------------------------------------------------------------------------------------|
| object     | A bartCauseFit object.                                                                                      |
| ...        | Additional arguments (e.g. newdata) passed to the underlying prediction method for the type of model given. |
| value      | The name of the output column.                                                                              |
| re_formula | If NULL (default), include all group-level effects; if NA, include no group-level effects.                  |
| fitstage   | If is.null(type), return posterior from response or treatment assignment model.                             |

---

linpred\_draws.stan4bartFit

*Get expected prediction draws (on linear scale) from posterior of stan4bart-package models*

---

**Description**

Typically referred to as fitted value draws on linear scale, where appropriate.

**Usage**

```
## S3 method for class 'stan4bartFit'
linpred_draws(object, newdata, ..., value = ".linpred", re_formula = NULL)
```

**Arguments**

|            |                                                                                              |
|------------|----------------------------------------------------------------------------------------------|
| object     | A stan4bartFit object.                                                                       |
| newdata    | Data frame to generate predictions from [optional].                                          |
| ...        | Additional arguments passed to the underlying prediction method for the type of model given. |
| value      | The name of the output column.                                                               |
| re_formula | If NULL (default), include all group-level effects; if NA, include no group-level effects.   |

---

posterior\_trees\_BART    *Get posterior tree draws into tibble format from BART model*

---

## Description

Tibble grouped by iteration ('iter') and tree id ('tree\_id'). All information calculated by method is included in output.

## Usage

```
posterior_trees_BART(model, label_digits = 2)
```

## Arguments

**model**                 BART model.  
**label\_digits**        Rounding for labels.

## Value

A tibble with columns to

**iter** Integer describing unique MCMC iteration.

**tree\_id** Integer. Unique tree id with each 'iter'.

**node** Integer describing node in tree. Unique to each 'tree'-'iter'.

**parent** Integer describing parent node in tree.

**label** Label for the node.

**tier** Position in tree hierarchy.

**var** Variable for split.

**cut** Numeric. Value of decision rule for 'var'.

**is\_leaf** Logical. 'TRUE' if leaf, 'FALSE' if stem.

**leaf\_value**

**child\_left** Integer. Left child of node.

**child\_right** Integer. Right child of node.

---

predicted\_draws.bartcFit

*Get prediction draws from posterior of bartCause-package objects*

---

## Description

Get prediction draws from posterior of bartCause-package objects

## Usage

```
## S3 method for class 'bartcFit'
predicted_draws(
  object,
  ...,
  value = ".prediction",
  re_formula = NULL,
  fitstage = c("response", "assignment")
)
```

## Arguments

|            |                                                                                                             |
|------------|-------------------------------------------------------------------------------------------------------------|
| object     | A bartCauseFit object.                                                                                      |
| ...        | Additional arguments (e.g. newdata) passed to the underlying prediction method for the type of model given. |
| value      | The name of the output column.                                                                              |
| re_formula | If NULL (default), include all group-level effects; if NA, include no group-level effects.                  |
| fitstage   | If is.null(type), return posterior from response or treatment assignment model.                             |

---

predicted\_draws.bartMachine

*Get predict draws from posterior of bartMachine model*

---

## Description

Get predict draws from posterior of bartMachine model

**Usage**

```
## S3 method for class 'bartMachine'
predicted_draws(
  object,
  newdata,
  value = ".prediction",
  ...,
  ndraws = NULL,
  include_newdata = TRUE,
  include_fitted = FALSE,
  include_sigsqs = FALSE
)
```

**Arguments**

|                 |                                                                                                                                      |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------|
| object          | A bartMachine model.                                                                                                                 |
| newdata         | Data frame to generate predictions from. If omitted, most model types will generate predictions from the data used to fit the model. |
| value           | The name of the output column for predicted_draws; default ".prediction".                                                            |
| ...             | Not currently in use.                                                                                                                |
| ndraws          | Not currently implemented.                                                                                                           |
| include_newdata | Should the newdata be included in the tibble?                                                                                        |
| include_fitted  | Should the posterior fitted values be included in the tibble?                                                                        |
| include_sigsqs  | Should the posterior sigma-squared draw be included?                                                                                 |

**Value**

A tidy data frame (tibble) with predicted values.

---

predicted\_draws.stan4bartFit

*Get prediction draws from posterior of stan4bart-package models*

---

**Description**

Get prediction draws from posterior of stan4bart-package models

**Usage**

```
## S3 method for class 'stan4bartFit'
predicted_draws(object, newdata, ..., value = ".prediction", re_formula = NULL)
```

**Arguments**

|            |                                                                                              |
|------------|----------------------------------------------------------------------------------------------|
| object     | A stan4bartFit object.                                                                       |
| newdata    | Data frame to generate predictions from [optional].                                          |
| ...        | Additional arguments passed to the underlying prediction method for the type of model given. |
| value      | The name of the output column.                                                               |
| re_formula | If NULL (default), include all group-level effects; if NA, include no group-level effects.   |

---

predicted\_draws.wbart *Get predict draws from posterior of wbart model*

---

**Description**

Get predict draws from posterior of wbart model

**Usage**

```
## S3 method for class 'wbart'
predicted_draws(
  object,
  newdata,
  value = ".prediction",
  ...,
  ndraws = NULL,
  include_newdata = TRUE,
  include_fitted = FALSE,
  include_sigsqs = FALSE
)
```

**Arguments**

|                 |                                                                                                                                      |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------|
| object          | A wbart model.                                                                                                                       |
| newdata         | Data frame to generate predictions from. If omitted, most model types will generate predictions from the data used to fit the model. |
| value           | The name of the output column for predicted_draws; default ".prediction".                                                            |
| ...             | Use to specify random number generator, default is rng=stats::rnorm.                                                                 |
| ndraws          | Not currently implemented.                                                                                                           |
| include_newdata | Should the newdata be included in the tibble?                                                                                        |
| include_fitted  | Should the posterior fitted values be included in the tibble?                                                                        |
| include_sigsqs  | Should the posterior sigma-squared draw be included?                                                                                 |

**Value**

A tidy data frame (tibble) with predicted values.

---

predicted\_draws\_BART    *Get predict draws from posterior of BART-package models*

---

## Description

Get predict draws from posterior of BART-package models

## Usage

```
predicted_draws_BART(
  object,
  newdata = NULL,
  value = ".prediction",
  ...,
  rng = stats::rnorm,
  include_newdata = TRUE,
  include_fitted = FALSE,
  include_sigsqs = FALSE
)
```

## Arguments

|                 |                                                                                                                                      |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------|
| object          | A BART-package model.                                                                                                                |
| newdata         | Data frame to generate predictions from. If omitted, most model types will generate predictions from the data used to fit the model. |
| value           | The name of the output column for predicted_draws; default ".prediction".                                                            |
| ...             | Arguments to pass to predict (e.g. <code>BART::predict.wbart</code> ).                                                               |
| rng             | Random number generator function. Default is <code>rnorm</code> for models with Gaussian errors.                                     |
| include_newdata | Should the newdata be included in the tibble?                                                                                        |
| include_fitted  | Should the posterior fitted values be included in the tibble?                                                                        |
| include_sigsqs  | Should the posterior sigma-squared draw be included?                                                                                 |

## Value

A tidy data frame (tibble) with predicted values.

---

`residual_draws.bartMachine`*Get residual draw for bartMachine model*

---

## Description

Get residual draw for bartMachine model

## Usage

```
## S3 method for class 'bartMachine'
residual_draws(
  object,
  newdata,
  value = ".residual",
  ...,
  ndraws = NULL,
  include_newdata = TRUE,
  include_sigsqs = FALSE
)
```

## Arguments

|                              |                                                                                              |
|------------------------------|----------------------------------------------------------------------------------------------|
| <code>object</code>          | bartMachine model.                                                                           |
| <code>newdata</code>         | Data frame to generate predictions from. If omitted, original data used to fit the model.    |
| <code>value</code>           | Name of the output column for residual_draws; default is <code>.residual</code> .            |
| <code>...</code>             | Additional arguments passed to the underlying prediction method for the type of model given. |
| <code>ndraws</code>          | Not currently implemented.                                                                   |
| <code>include_newdata</code> | Should the newdata be included in the tibble?                                                |
| <code>include_sigsqs</code>  | Should the posterior sigma-squared draw be included?                                         |

## Value

Tibble with residuals.

---

residual\_draws.pbart    *Get residual draw for pbart model*


---

## Description

The original response variable must be passed as an argument to this function. e.g. ‘response = y’

## Usage

```
## S3 method for class 'pbart'
residual_draws(
  object,
  newdata,
  value = ".residual",
  ...,
  ndraws = NULL,
  include_newdata = TRUE,
  include_sigsqs = FALSE
)
```

## Arguments

|                 |                                                                                              |
|-----------------|----------------------------------------------------------------------------------------------|
| object          | wbart model.                                                                                 |
| newdata         | Data frame to generate predictions from. If omitted, original data used to fit the model.    |
| value           | Name of the output column for residual_draws; default is .residual.                          |
| ...             | Additional arguments passed to the underlying prediction method for the type of model given. |
| ndraws          | Not currently implemented.                                                                   |
| include_newdata | Should the newdata be included in the tibble?                                                |
| include_sigsqs  | Should the posterior sigma-squared draw be included?                                         |

## Value

Tibble with residuals.

---

residual\_draws.wbart    *Get residual draw for wbart model*

---

## Description

The original response variable must be passed as an argument to this function. e.g. ‘response = y’

## Usage

```
## S3 method for class 'wbart'
residual_draws(
  object,
  newdata,
  value = ".residual",
  ...,
  ndraws = NULL,
  include_newdata = TRUE,
  include_sigsqs = FALSE
)
```

## Arguments

|                 |                                                                                              |
|-----------------|----------------------------------------------------------------------------------------------|
| object          | wbart model.                                                                                 |
| newdata         | Data frame to generate predictions from. If omitted, original data used to fit the model.    |
| value           | Name of the output column for residual_draws; default is .residual.                          |
| ...             | Additional arguments passed to the underlying prediction method for the type of model given. |
| ndraws          | Not currently implemented.                                                                   |
| include_newdata | Should the newdata be included in the tibble?                                                |
| include_sigsqs  | Should the posterior sigma-squared draw be included?                                         |

## Value

Tibble with residuals.

---

|                     |                                         |
|---------------------|-----------------------------------------|
| residual_draws_BART | <i>Get residual draw for BART model</i> |
|---------------------|-----------------------------------------|

---

**Description**

Classes from BART-package models

**Usage**

```
residual_draws_BART(
  object,
  response,
  newdata = NULL,
  value = ".residual",
  include_newdata = TRUE,
  include_sigsqs = FALSE
)
```

**Arguments**

|                 |                                                                                           |
|-----------------|-------------------------------------------------------------------------------------------|
| object          | model from BART package.                                                                  |
| response        | Original response vector.                                                                 |
| newdata         | Data frame to generate predictions from. If omitted, original data used to fit the model. |
| value           | Name of the output column for residual_draws; default is .residual.                       |
| include_newdata | Should the newdata be included in the tibble?                                             |
| include_sigsqs  | Should the posterior sigma-squared draw be included?                                      |

**Value**

Tibble with residuals.

---

|                       |                                                             |
|-----------------------|-------------------------------------------------------------|
| simulate_su_hill_data | <i>Simulate data with scenarios from Hill and Su (2013)</i> |
|-----------------------|-------------------------------------------------------------|

---

**Description**

Sample  $n$  observations with the following scheme:

1. Covariates:  $X_j \sim N(0, 1)$ .
2. Assignment:  $Z \sim \text{Bin}(n, p)$  with  $p = \text{logit}^{-1}(a + X\gamma^L + Q\gamma^N)$  where  $a = \omega - \text{mean}(X\gamma^L + Q\gamma^N)$ .
3. Mean response:  $E(Y(0)|X) = X\beta_0^L + Q\beta_0^N$  and  $E(Y(1)|X) = X\beta_1^L + Q\beta_1^N$ .
4. Observation:  $Y \sim N(\mu, \sigma_y^2)$ .

Superscript  $L$  denotes the linear components, whilst  $N$  denotes the non-linear components.

**Usage**

```
simulate_su_hill_data(
  n,
  treatment_linear = TRUE,
  response_parallel = TRUE,
  response_aligned = TRUE,
  y_sd = 1,
  tau = 4,
  omega = 0,
  add_categorical = FALSE,
  n_subjects = 0,
  sd_subjects = 1,
  coef_categorical_treatment = NULL,
  coef_categorical_nontreatment = NULL
)
```

**Arguments**

|                               |                                                                                                       |
|-------------------------------|-------------------------------------------------------------------------------------------------------|
| n                             | Size of simulated sample.                                                                             |
| treatment_linear              | Treatment assignment mechanism is linear?                                                             |
| response_parallel             | Response surface is parallel?                                                                         |
| response_aligned              | Response surface is aligned?                                                                          |
| y_sd                          | Observation noise.                                                                                    |
| tau                           | Treatment effect for parallel response surfaces. Not applicable if surface is non-parallel.           |
| omega                         | Offset to control treatment assignment ratios.                                                        |
| add_categorical               | Should a categorical variable be added? (Not in Hill and Su)                                          |
| n_subjects                    | How many subjects are there? For repeated observations. (Hill and Su = 0, default)                    |
| sd_subjects                   | Random effect intercept standard deviation for subjects. (Not in Hill and Su. Used if n_subjects > 0) |
| coef_categorical_treatment    | What are the coefficients of the categorical variable under treatment? (Not in Hill and Su)           |
| coef_categorical_nontreatment | What are the coefficients of the categorical variable under nontreatment? (Not in Hill and Su)        |

**Details**

Coefficients used are returned in the list this function creates. See Table 1 in Su and Hill (2013) for the table of coefficients. The  $X_j$  are in a data.frame named data in the returned list. The

formula for the model matrix  $[X, Q]$  is named `su_hill_formula` in the returned list. The coefficients used for the model matrix are contained in `coefs`. The Su and Hill (2013) simulations did not include categorical variables, but you can add them here using arguments: `add_categorical`, `coef_categorical_treatment`, `coef_categorical_nontreatment`.

Hill, Jennifer; Su, Yu-Sung. Ann. Appl. Stat. 7 (2013), no. 3, 1386–1420. doi:10.1214/13-AOAS630. <https://projecteuclid.org/euclid.aoas/1380804800>

## Value

An object of class `suhillsim` that is a list with elements

|                       |                                             |
|-----------------------|---------------------------------------------|
| <code>data</code>     | Simulated data in <code>data.frame</code>   |
| <code>mean_y</code>   | The mean y values for each individual (row) |
| <code>args</code>     | List of arguments passed to function        |
| <code>formulas</code> | Response formulas used to generate data     |
| <code>coefs</code>    | Coefficients for the formulas               |

---

|                         |                                    |
|-------------------------|------------------------------------|
| <code>suhillsim1</code> | <i>Example simulated dataset 1</i> |
|-------------------------|------------------------------------|

---

## Description

Simulated with `simulate_su_hill_data(...)`, see details. Includes propensity score estimated using BART (`prop_score`), see source.

## Usage

```
suhillsim1
```

## Format

See `?simulate_su_hill_data` for output format.

## Details

```
set.seed(101)
suhillsim1 <- simulate_su_hill_data(n = 100, treatment_linear = FALSE, omega = 0, add_categorical = TR
  coef_categorical_treatment = c(0,0,1),
  coef_categorical_nontreatment = c(-1,0,-1))
```

## Source

<https://github.com/bonStats/tidytreatment/tree/master/data-raw>

---

suhillsim2\_ranef

*Example simulated dataset 2: with subject specific random effects*


---

### Description

Simulated with `simulate_su_hill_data(...)`, see details.

### Usage

```
suhillsim2_ranef
```

### Format

See `?simulate_su_hill_data` for output format.

### Details

```
set.seed(101)
suhillsim1 <- simulate_su_hill_data(n = 100, treatment_linear = FALSE, omega = 0, add_categorical = TRUE,
  coef_categorical_treatment = c(0,0,1),
  coef_categorical_nontreatment = c(-1,0,-1), sd_subjects = 2, n_subjects = 10)
```

### Source

<https://github.com/bonStats/tidytreatment/tree/master/data-raw>

---

tidytreatment

*tidytreatment: Tidy methods for Bayesian treatment effect models*


---

### Description

`tidytreatment` provides functions for extracting tidy data from Bayesian treatment effect models, estimating treatment effects, and plotting useful summaries of these.

### Author(s)

**Maintainer:** Joshua J Bon <joshua.jbon@gmail.com> ([ORCID](#))

### See Also

Useful links:

- <https://github.com/bonStats/tidytreatment>
- Report bugs at <https://github.com/bonStats/tidytreatment/issues>

---

|          |                                                          |
|----------|----------------------------------------------------------|
| tidy_ate | <i>Get average treatment effect draws from posterior</i> |
|----------|----------------------------------------------------------|

---

**Description**

ATE = Average Treatment Effects Assumes treated column is either a integer column of 1's (treated) and 0's (nontreated) or logical indicating treatment if TRUE.

**Usage**

```
tidy_ate(model, treatment, common_support_method, cutoff, ...)
```

**Arguments**

|                       |                                                                                             |
|-----------------------|---------------------------------------------------------------------------------------------|
| model                 | A supported Bayesian model fit that can provide fits and predictions.                       |
| treatment             | A character string specifying the name of the treatment variable.                           |
| common_support_method | Either "sd", or "chisq". Default is unspecified, and no common support calculation is done. |
| cutoff                | Cutoff for common support (if in use).                                                      |
| ...                   | Arguments to be passed to tidybayes::fitted_draws typically scale for BART models.          |

**Value**

A tidy data frame (tibble) with treatment effect values.

---

|          |                                                                     |
|----------|---------------------------------------------------------------------|
| tidy_att | <i>Get average treatment effect on treated draws from posterior</i> |
|----------|---------------------------------------------------------------------|

---

**Description**

ATT = average Treatment Effects on Treated Assumes treated column is either a integer column of 1's (treated) and 0's (nontreated) or logical indicating treatment if TRUE.

**Usage**

```
tidy_att(model, treatment, common_support_method, cutoff, ...)
```

**Arguments**

|                       |                                                                                             |
|-----------------------|---------------------------------------------------------------------------------------------|
| model                 | A supported Bayesian model fit that can provide fits and predictions.                       |
| treatment             | A character string specifying the name of the treatment variable.                           |
| common_support_method | Either "sd", or "chisq". Default is unspecified, and no common support calculation is done. |
| cutoff                | Cutoff for common support (if in use).                                                      |
| ...                   | Arguments to be passed to tidybayes::fitted_draws typically scale for BART models.          |

**Value**

A tidy data frame (tibble) with treatment effect values.

---

|                     |                                                              |
|---------------------|--------------------------------------------------------------|
| tidy_draws.bartcFit | <i>Tidy access to posterior of bartCause-package objects</i> |
|---------------------|--------------------------------------------------------------|

---

**Description**

Tidy access to posterior of bartCause-package objects

**Usage**

```
## S3 method for class 'bartcFit'
tidy_draws(model, type = NULL, fitstage = c("response", "assignment"), ...)
```

**Arguments**

|          |                                                                                 |
|----------|---------------------------------------------------------------------------------|
| model    | A bartCauseFit object.                                                          |
| type     | Posterior quantity to return. See <a href="#">bartc-generics</a> .              |
| fitstage | If is.null(type), return posterior from response or treatment assignment model. |
| ...      | Additional parameters passed up the generic method chain.                       |

---

|                   |                                                               |
|-------------------|---------------------------------------------------------------|
| treatment_effects | <i>Get (individual) treatment effect draws from posterior</i> |
|-------------------|---------------------------------------------------------------|

---

## Description

CTE = Conditional Treatment Effects (usually used to generate (C)ATE or ATT) newdata specifies the conditions, if unspecified it defaults to the original data. Assumes treated column is either a integer column of 1's (treated) and 0's (nontreated) or logical indicating treatment if TRUE.

## Usage

```
treatment_effects(
  model,
  treatment,
  newdata,
  subset = "all",
  common_support_method,
  cutoff,
  ...
)
```

## Arguments

|                       |                                                                                                    |
|-----------------------|----------------------------------------------------------------------------------------------------|
| model                 | A supported Bayesian model fit that can provide fits and predictions.                              |
| treatment             | A character string specifying the name of the treatment variable.                                  |
| newdata               | Data frame to generate fitted values from. If omitted, defaults to the data used to fit the model. |
| subset                | Either "treated", "nontreated", or "all". Default is "all".                                        |
| common_support_method | Either "sd", or "chisq". Default is unspecified, and no common support calculation is done.        |
| cutoff                | Cutoff for common support (if in use).                                                             |
| ...                   | Arguments to be passed to <code>tidybayes::fitted_draws</code> typically scale for BART models.    |

## Value

A tidy data frame (tibble) with treatment effect values.

---

treatment\_effects.bartcFit

*Get (individual) treatment effect draws from bartcFit posterior*


---

## Description

CTE = Conditional Treatment Effects (usually used to generate (C)ATE or ATT) newdata specifies the conditions, if unspecified it defaults to the original data. Assumes treated column is either a integer column of 1's (treated) and 0's (nontreated) or logical indicating treatment if TRUE.

## Usage

```
## S3 method for class 'bartcFit'
treatment_effects(
  model,
  treatment = NULL,
  newdata = NULL,
  subset = "all",
  common_support_method,
  cutoff,
  ...
)
```

## Arguments

|                       |                                                                                             |
|-----------------------|---------------------------------------------------------------------------------------------|
| model                 | A supported Bayesian model fit that can provide fits and predictions.                       |
| treatment             | Not used. Treatment variable specified by bartcFit object.                                  |
| newdata               | Not used. extracts treatment effects already calculated by bartcFit object.                 |
| subset                | Either "treated", "nontreated", or "all". Default is "all".                                 |
| common_support_method | Either "sd", or "chisq". Default is unspecified, and no common support calculation is done. |
| cutoff                | Cutoff for common support (if in use).                                                      |
| ...                   | Arguments to be passed to tidybayes::fitted_draws typically scale for BART models.          |

## Value

A tidy data frame (tibble) with treatment effect values.

---

treatment\_effects.default

*Get treatment effect draws from posterior*


---

## Description

CTE = Conditional Treatment Effects (or CATE, the average effects) newdata specifies the conditions, if unspecified it defaults to the original data. Assumes treated column is either a integer column of 1's (treated) and 0's (nontreated) or logical indicating treatment if TRUE.

## Usage

```
## Default S3 method:
treatment_effects(
  model,
  treatment,
  newdata,
  subset = "all",
  common_support_method,
  cutoff,
  ...
)
```

## Arguments

|                       |                                                                                                    |
|-----------------------|----------------------------------------------------------------------------------------------------|
| model                 | A supported Bayesian model fit that can provide fits and predictions.                              |
| treatment             | A character string specifying the name of the treatment variable.                                  |
| newdata               | Data frame to generate fitted values from. If omitted, defaults to the data used to fit the model. |
| subset                | Either "treated", "nontreated", or "all". Default is "all".                                        |
| common_support_method | Either "sd", or "chisq". Default is unspecified, and no common support calculation is done.        |
| cutoff                | Cutoff for common support (if in use).                                                             |
| ...                   | Arguments to be passed to tidybayes::fitted_draws typically scale for BART models.                 |

## Value

A tidy data frame (tibble) with treatment effect values.

---

|                |                                                         |
|----------------|---------------------------------------------------------|
| variance_draws | <i>Get variance draws from posterior of BART models</i> |
|----------------|---------------------------------------------------------|

---

**Description**

Models from BART-package include warm-up and skipped MCMC draws.

**Usage**

```
variance_draws(model, value = ".sigma_sq", ...)
```

**Arguments**

|       |                                                                            |
|-------|----------------------------------------------------------------------------|
| model | A model from a supported package.                                          |
| value | The name of the output column for variance parameter; default ".sigma_sq". |
| ...   | Additional arguments.                                                      |

**Value**

A tidy data frame (tibble) with draws of variance parameter

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