

# Package ‘GK2011’

October 12, 2022

**Type** Package

**Title** Gaines and Kuklinski (2011) Estimators for Hybrid Experiments

**Version** 0.1.3

**Date** 2016-05-26

**Description** Implementations of the treatment effect estimators for hybrid (self-selection) experiments, as developed by Brian J. Gaines and James H. Kuklinski, (2011), "Experimental Estimation of Heterogeneous Treatment Effects Related to Self-Selection," American Journal of Political Science 55(3): 724-736.

**License** GPL (>= 2)

**URL** <https://github.com/leeper/GK2011>

**BugReports** <https://github.com/leeper/GK2011/issues>

**LazyData** TRUE

**Imports** stats

**Suggests** testthat

**RoxygenNote** 5.0.1

**NeedsCompilation** no

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**Repository** CRAN

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## R topics documented:

GK2011-package	2
ajps	2
estimate	3
<b>Index</b>	<b>6</b>

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GK2011-package

*GK2011*

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**Description**

Gaines and Kuklinski (2011) Estimators for Hybrid Experiments

**Author(s)**

Thomas J. Leeper <thosjleeper@gmail.com>

**References**

Brian J. Gaines and James H. Kuklinski, (2011), "Experimental Estimation of Heterogeneous Treatment Effects Related to Self-Selection," *American Journal of Political Science* 55(3): 724-736.

**See Also**

[estimate](#)

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ajps

*Gaines and Kuklinski (2011) AJPS data*

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**Description**

Subset of data from Gaines and Kuklinski (2011)

**Usage**

ajps

**Format**

**tr** The treatment indicator, where 1=treatment, 2=control, 3=chose treatment, 4=chose control.

**therm.obama** A "feeling thermometer" toward John McCain.

**therm.mccain** A "feeling thermometer" toward Barack Obama.

**pid** An indicator of party identification, where -1=Republican, 0=Independent, 1=Democrat.

**Details**

This dataset contains a subset of variables, extracted from the dataset used by Gaines and Kuklinski (2011).

**Source**

Brian J. Gaines and James H. Kuklinski, (2011), "Experimental Estimation of Heterogeneous Treatment Effects Related to Self-Selection," *American Journal of Political Science* 55(3): 724-736.

**See Also**

[estimate](#)

**Examples**

```
data(ajps)

# replicate Gaines and Kuklinski (2011) Table 2
pmean <- function(x) sprintf("%0.1f", mean(x))
cbind(
  # Democrats
  aggregate(cbind(therm.mccain, therm.obama) ~ tr,
            data = ajps[ajps$pid == 1, ], FUN = pmean)[, 1:3],
  n_dem = aggregate(therm.obama ~ tr,
                    data = ajps[ajps$pid == 1, ], FUN = length)[, 2],
  # Republicans
  aggregate(cbind(therm.mccain, therm.obama) ~ tr,
            data = ajps[ajps$pid == -1, ], FUN = pmean)[, 2:3],
  n_rep = aggregate(therm.obama ~ tr,
                    data = ajps[ajps$pid == -1, ], FUN = length)[, 2]
)

# effects for McCain among Democrats
with(ajps[ajps$pid == 1, ], {
  estimate(rand = tr %in% 1:2, tr = tr %in% c(1,3), y = therm.mccain)
})
# effects for McCain among Republicans
with(ajps[ajps$pid == -1, ], {
  estimate(rand = tr %in% 1:2, tr = tr %in% c(1,3), y = therm.mccain)
})

# effects for Obama among Democrats
with(ajps[ajps$pid == 1, ], {
  estimate(rand = tr %in% 1:2, tr = tr %in% c(1,3), y = therm.obama)
})
# effects for Obama among Republicans
with(ajps[ajps$pid == -1, ], {
  estimate(rand = tr %in% 1:2, tr = tr %in% c(1,3), y = therm.obama)
})
```

**Description**

Estimators for Hybrid Experiments

**Usage**

```
estimate(rand, tr, y, iterations = 5000L)
```

**Arguments**

rand	An integer or logical vector specifying whether each observation is from the random (1) or self-selection (0) arm of the experiment.
tr	An integer or logical vector specifying whether each observation was treated (1) or control (0), regardless of the arm of the experiment.
y	A numeric vector specifying outcome values.
iterations	An integer specifying the number of bootstrap iterations used to estimate standard errors.

**Details**

The package provides R implementations of the treatment effect estimators for hybrid (self-selection) experiments, as developed by Gaines and Kuklinski (2011). These functions estimate local average treatment effects for unobserved population subgroups inclined and disinclined to be treated, as revealed by a three-condition (two-arm) experimental design. In the design, participants are randomly assigned to one of three conditions: 1) treatment (T), 2) control (C), or 3) self-selection (S) of treatment or control. The design enables the estimation of three treatment effects:

1. First, the sample average treatment effect is estimated from conditions (1) and (2) as:  $\hat{t} = \bar{Y}_T - \bar{Y}_C$
2. The effect for those inclined to choose treatment is given by:  $\hat{t}_s = \frac{\bar{Y}_S - \bar{Y}_C}{\hat{\alpha}}$  where  $\hat{\alpha}$  is the observed proportion of individuals in group S that choose T (rather than C).
3. The effect for those disinclined to choose treatment (or, equivalently, inclined to choose control) is given by:  $\hat{t}_n = \frac{\bar{Y}_T - \bar{Y}_S}{1 - \hat{\alpha}}$

By definition, the sample average treatment effect is an average of the other two effects.

**Value**

A data.frame containing the following variables:

- Effect, a character vector of effect names (“t”, “t\_s”, “t\_n”, “naive”)
- Estimate, a numeric vector of effect estimates
- SE, a numeric vector of bootstrapped standard errors
- t, a t-statistic for the effect
- p, a two-tailed p-value

The return value will also carry an attribute “alpha”, indicating the estimated proportion  $\alpha$ .

**Author(s)**

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**References**

Brian J. Gaines and James H. Kuklinski, (2011), "Experimental Estimation of Heterogeneous Treatment Effects Related to Self-Selection," *American Journal of Political Science* 55(3): 724-736.

**See Also**

[ajps](#)

**Examples**

```
# create fake data
set.seed(12345)
d <-
data.frame(rand = c(rep(1, 200), rep(0, 100)),
            tr = c(rep(0, 100), rep(1, 100), rep(0, 37), rep(1, 63)),
            y = c(rnorm(100), rnorm(100) + 1, rnorm(37), rnorm(63) + 3))

# estimate effects
estimate(rand = d$rand, tr = d$tr, y = d$y)
```

# Index

\* **datasets**

ajps, [2](#)

\* **package**

GK2011-package, [2](#)

ajps, [2](#), [5](#)

estimate, [2](#), [3](#), [3](#)

GK2011 (GK2011-package), [2](#)

GK2011-package, [2](#)