

# Package ‘perccalc’

May 9, 2026

**Title** Estimate Percentiles from an Ordered Categorical Variable

**Version** 1.0.5

**Description** An implementation of two functions that estimate values for percentiles from an ordered categorical variable as described by Reardon (2011, isbn:978-0-87154-372-1). One function estimates percentile differences from two percentiles while the other returns the values for every percentile from 1 to 100.

**Depends** R (>= 3.4.0)

**License** MIT + file LICENSE

**URL** <https://cimentadaj.github.io/perccalc/>,  
<https://github.com/cimentadaj/perccalc>

**Language** en-US

**Encoding** UTF-8

**LazyData** true

**RoxygenNote** 7.0.1

**Imports** stats, tibble, multcomp

**Suggests** magrittr, spelling, dplyr, knitr, rmarkdown, testthat,  
ggplot2, MASS, carData, tidyr (>= 1.0.0), covr

**VignetteBuilder** knitr

**NeedsCompilation** no

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**Repository** CRAN

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perc_diff	<i>Calculate percentile differences from an ordered categorical variable and a continuous variable.</i>
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### Description

Calculate percentile differences from an ordered categorical variable and a continuous variable.

### Usage

```
perc_diff(
  data_model,
  categorical_var,
  continuous_var,
  weights = NULL,
  percentiles = c(90, 10)
)
```

```
perc_diff_df(
  data_model,
  categorical_var,
  continuous_var,
  weights = NULL,
  percentiles = c(90, 10)
)
```

### Arguments

data_model	A data frame with at least the categorical and continuous variables from which to estimate the percentile differences
categorical_var	The bare unquoted name of the categorical variable. This variable SHOULD be an ordered factor. If not, will raise an error.
continuous_var	The bare unquoted name of the continuous variable from which to estimate the percentiles
weights	The bare unquoted name of the optional weight variable. If not specified, then estimation is done without weights
percentiles	A numeric vector of two numbers specifying which percentiles to subtract

### Details

perc\_diff drops missing observations silently for calculating the linear combination of coefficients.

**Value**

perc\_diff returns a vector with the percentile difference and its associated standard error. perc\_diff\_df returns the same but as a data frame.

**Examples**

```
set.seed(23131)
N <- 1000
K <- 20

toy_data <- data.frame(id = 1:N,
                      score = rnorm(N, sd = 2),
                      type = rep(paste0("inc", 1:20), each = N/K),
                      wt = 1)

# perc_diff(toy_data, type, score)
# type is not an ordered factor!

toy_data$type <- factor(toy_data$type, levels = unique(toy_data$type), ordered = TRUE)

perc_diff(toy_data, type, score, percentiles = c(90, 10))
perc_diff(toy_data, type, score, percentiles = c(50, 10))

perc_diff(toy_data, type, score, weights = wt, percentiles = c(30, 10))
# Results as data frame
perc_diff_df(toy_data, type, score, weights = wt, percentiles = c(30, 10))
```

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perc\_dist

*Calculate a distribution of percentiles from an ordered categorical variable and a continuous variable.*

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**Description**

Calculate a distribution of percentiles from an ordered categorical variable and a continuous variable.

**Usage**

```
perc_dist(data_model, categorical_var, continuous_var, weights = NULL)
```

**Arguments**

`data_model` A data frame with at least the categorical and continuous variables from which to estimate the percentiles

categorical_var	The bare unquoted name of the categorical variable. This variable <b>should</b> be an ordered factor. If not, will raise an error.
continuous_var	The bare unquoted name of the continuous variable from which to estimate the percentiles
weights	The bare unquoted name of the optional weight variable. If not specified, then equal weights are assumed.

### Details

perc\_dist drops missing observations silently for calculating the linear combination of coefficients.

### Value

A data frame with the scores and standard errors for each percentile

### Examples

```
set.seed(23131)
N <- 1000
K <- 20

toy_data <- data.frame(id = 1:N,
                      score = rnorm(N, sd = 2),
                      type = rep(paste0("inc", 1:20), each = N/K),
                      wt = 1)

# perc_diff(toy_data, type, score)
# type is not an ordered factor!

toy_data$type <- factor(toy_data$type, levels = unique(toy_data$type), ordered = TRUE)

perc_dist(toy_data, type, score)
```

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pisa_2006	<i>Mathematics test scores of Spain, Germany and Estonia in the PISA 2006 test</i>
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### Description

A dataset containing the test scores and other household information of students from Spain, Germany and Estonia from the PISA 2006 test.

### Usage

```
pisa_2006
```

**Format**

A data frame with 25884 rows and 10 variables:

**year** Year of the survey

**CNT** Long country names

**STIDSTD** Unique student id

**father\_edu** The father's highest achieved degree in the ISCED scale

**household\_income** The household's total income in categories

**avg\_math** The average math test score out of the 5 plausible values in Mathematics

**Source**

A subset extracted from the PISA2006lite R package, <https://github.com/pbiecek/PISA2012lite>

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pisa_2012	<i>Mathematics test scores of Spain, Germany and Estonia in the PISA 2012 test</i>
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**Description**

A dataset containing the test scores and other household information of students from Spain, Germany and Estonia from the PISA 2012 test.

**Usage**

```
pisa_2012
```

**Format**

A data frame with 35093 rows and 10 variables:

**year** Year of the survey

**CNT** Long country names

**STIDSTD** Unique student id

**father\_edu** The father's highest achieved degree in the ISCED scale

**household\_income** The household's total income in categories

**avg\_math** The average math test score out of the 5 plausible values in Mathematics

**Source**

A subset extracted from the PISA2012lite R package, <https://github.com/pbiecek/PISA2012lite>

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