# Package: lavacreg (via r-universe)

September 11, 2024

**Type** Package

**Title** Latent Variable Count Regression Models

**Version** 0.2-2

**Date** 2024-06-13

**Description** Estimation of a multi-group count regression models (i.e., Poisson, negative binomial) with latent covariates. This packages provides two extensions compared to ordinary count regression models based on a generalized linear model: First, measurement models for the predictors can be specified allowing to account for measurement error. Second, the count regression can be simultaneously estimated in multiple groups with stochastic group weights. The marginal maximum likelihood estimation is described in Kiefer & Mayer (2020) <doi:10.1080/00273171.2020.1751027>.

**License** GPL (>= 2)

**URL** https://github.com/chkiefer/lavacreg

**BugReports** https://github.com/chkiefer/lavacreg/issues

**LazyData** true

**Depends** R (>= 3.5.0)

**Imports** Rcpp (>= 1.0.5), fastGHQuad, pracma, methods, stats, SparseGrid

**LinkingTo** Rcpp, RcppArmadillo

**RoxygenNote** 7.3.1

**Suggests** knitr, rmarkdown, testthat

**Encoding** UTF-8

**VignetteBuilder** knitr

**Repository** https://chkiefer.r-universe.dev

**RemoteUrl** https://github.com/chkiefer/lavacreg

**RemoteRef** HEAD

**RemoteSha** 456cec6d59b3a89519688db54fcee29bbd827243

# Contents



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`countreg` *Fitting Count Regression Models with Latent Covariates*

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## Description

This function is the main function of the package and can be used to estimate latent variable count regression models in one or multiple group(s).

## Usage

```
countreg(
  forml,
  data,
  lv = NULL,
  group = NULL,
  family = "poisson",
  silent = FALSE,
  se = TRUE,
  creg_options = NULL
)
```

## Arguments

| | |
|---|---|
| `forml` | An object of class `formula` (or one that can be coerced to that class): a symbolic description of the model to be fitted. The details of model specification are given under Details. |
| `data` | A data frame containing all variables specified in `forml` and/or indicators of the latent variables specified in `lv` (if applicable). |
| `lv` | A named list, where names of elements represent the names of the latent variables and each element consists of a character vector containing variable names of indicators for the respective latent variable, e.g., `list(eta1 = c("z1", "z2", "z3"))`. |
| `group` | A group variable. If specified, the regression model specified in `forml` is estimated as multi-group model (i.e., within each group). |
| `family` | A character indicating the family of the generalized linear model to be estimated. At the moment, `"poisson"` (for Poisson regression; default) or `"nbinom"` (for negative binomial regression) are available. |

| | |
|---|---|
| silent | Logical. Should informations about the estimation process be suppressed? (Defaults to FALSE) |
| se | Logical. Should standard errors be computed? Defaults to TRUE. (Can take a while for complex models) |
| creg_options | optional list of additional options for the estimation procedure |

## Value

An object of type lavacreg. Use summary(object) to print results containing parameter estimates and their standard errors.

## Examples

```
fit <- countreg(forml = "dv ~ z11", data = example01, family = "poisson")
summary(fit)

fit <- countreg(
  forml = "dv ~ eta1 + z11 + z21",
  lv = list(eta1 = c("z41", "z42", "z43")),
  group = "treat",
  data = example01,
  family = "poisson"
)
summary(fit)
```

---

# example01 *A first example dataset to illustrate the use of lavacreg*

---

## Description

A dataset containing 9 variables: a dependent variable dv, a group variable treat and 7 indicators for 3 latent covariates.

## Usage

```
example01
```

## Format

A data frame with 871 rows and 9 variables:

**dv** Count of correctly-answered items (dependent variable)

**treat** Treatment group variable, where 0 is control and 2 is treatment

**z11** First indicator of internal LoC

**z12** Second indicator of internal LoC

**z21** First indicator of external LoC

**z22** Second indicator of external LoC

**z41** First indicator of depression

**z42** Second indicator of depression

**z43** Third indicator of depression

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`is_count` *Check for count variable*

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## Description

Checks if the variable is a count variable

## Usage

```
is_count(x, tol = .Machine$double.eps^0.5)
```

## Arguments

| | |
|---|---|
| `x` | vector to be checked |
| `tol` | Tolerance |

## Value

Function returns logical value indicating whether x can be considered a count variable or not.

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`summary,lavacreg-method` *Summary of a lavacreg object*

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## Description

Exports the parameter table with parameter estimates and standard errors for an estimated latent variable count regression model.

## Usage

```
## S4 method for signature 'lavacreg'
summary(object)
```

## Arguments

| | |
|---|---|
| `object` | lavacreg object |

## Value

Function prints the parameter table of an estimated model, which includes the parameter estimates and standard errors.

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