Package ‘Fahrmeir’

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Title Data from the Book "Multivariate Statistical Modelling Based on Generalized Linear Models", First Edition, by Ludwig Fahrmeir and Gerhard Tutz

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Description

Effects of age and smoking status on breathing test results for workers in industrial plants in Texas.

Usage

data(breath)

Format

A data frame with 18 observations on the following 4 variables.

- **Age** a factor with levels <40 40-59
- **n** number of workers in group
- **Smoking.status** a factor with levels Current.smoker Former.smoker Never.smoked
- **Breathing.test** a factor with levels Abnormal Borderline Normal

Details

We consider the effects of age and smoking status upon breathing test results for workers in industrial plants in Texas. The test results are given on an ordered scale with categories "Abnormal", "Borderline" and "Normal". It is of interest how age and smoking status are connected to breathing test results.

Source


Examples

```r
str(breath)
breath$Breathing.test <- ordered(breath$Breathing.test)
library(MASS)
breath.polr1 <- polr(Breathing.test ~ Age*Smoking.status, weight=n, data=breath)
breath.polr2 <- polr(Breathing.test ~ Age*Smoking.status, weight=n, data=breath, method="cloglog")
summary(breath.polr1)
summary(breath.polr2)
# continuation ratio models (as of page 89) might be fitted with
# Design or VGAM package.
```
Caesarian Birth Study

Description
Data on infection from births by Caesarian section

Usage
data(caesar)

Format
A data frame with 24 observations on the following 7 variables.

- **y**: a factor with levels 1 2 3, the response
- **w**: number of patients in group
- **noplan**: a factor with levels not planned, was the caesarian planned?
- **factor**: a factor with levels risk factors without, was there risk factors?
- **antib**: a factor with levels antibiotics without
- **yl**: logistic response, 0=no infection
- **patco**: covariate pattern number

Details
Infection from birth by Caesarian section. The response variable, y, has levels 1=type I infection, 2=type II infection, 3=none infection. Where risk-factors (diabetes, overweight, others) present? Where antibiotics used as prophylaxis? Aim is to analyse effects on response by covariates.

Author(s)
Kjetil Halvorsen

Source

Examples
summary(caesar)
caesar.glml <- glm(yl ~ noplan+factor+antib, data=caesar, weight=w,
                   family=binomial(link="logit"))
caesar.glm2 <- glm(yl ~ noplan+factor+antib, data=caesar, weight=w,
                   family=binomial(link="probit"))
summary(caesar.glml)
summary(caesar.glm2)
Description

The effect of two agents of immuno-activating ability that may induce cell differentiation was investigated.

Usage

data(cells)

Format

A data frame with 16 observations on the following 3 variables.

y  number of cells differentiating
TNF  dose of TNF, U/ml
IFN  dose of IFN, U/ml

Details

The effect of two agents of immuno-activating ability that may induce cell differentiation was investigated. As response variable the number of cells that exhibited markers after exposure was recorded. It is of interest if the agents TNF (tumor necrosis factor) and IFN (interferon) stimulate cell differentiation independently, or if there is a synergetic effect. 200 cells were examined at each dose combination.

Author(s)

Kjetil Halvorsen

Source


Examples

str(cells)
cells.poisson <- glm(y~TNF+IFN+TNF:IFN, data=cells, family=poisson)
summary(cells.poisson)
confint(cells.poisson)
# Now we follow the book, example 2.6, page 51:
# there seems to be overdispersion?
cells.quasi <- glm(y~TNF+IFN+TNF:IFN, data=cells, family=quasipoisson)
# We follow the book, example 2.7, page 56:
with(cells, tapply(y, factor(TNF), function(x) c(mean(x), var(x))))
# which might indicate the use of a negative binomial model

---

**credit**

*Credit Score Data From a South German Bank*

**Description**

The credit data frame has 1000 rows and 8 columns. This are data for 1000 clients of a south german bank, 700 good payers and 300 bad payers. They are used to construct a credit scoring method.

**Usage**

data(credit)

**Format**

This data frame contains the following columns:

- **Y**: a factor with levels buen mal, the response variable. buen is the good payers.
- **Cuenta**: a factor with levels no good running bad running, quality of the credit clients bank account.
- **Mes**: a numeric vector, duration of loan in months.
- **Ppag**: a factor with levels pre buen pagador pre mal pagador, if the client previously have been a good or bad payer.
- **Use**: a factor with levels privado profesional, the use to which the loan is made.
- **DM**: a numeric vector, the size of loan in german marks.
- **Sexo**: a factor with levels mujer hombre, sex of the client.
- **Estc**: a factor with levels no vive solo vive solo, civil state of the client.

**Source**


**Examples**

summary(credit)
### happy

**Reported Happiness**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rep.happiness</td>
<td>an ordered factor with levels Not to happy &lt; Pretty happy &lt; Very happy</td>
</tr>
<tr>
<td>School</td>
<td>a factor with levels &lt;12 &gt;16 12 13-16</td>
</tr>
<tr>
<td>Sex</td>
<td>a factor with levels Females Males</td>
</tr>
<tr>
<td>n</td>
<td>number of persons in group</td>
</tr>
</tbody>
</table>

**Description**

Relationship between sex, years in school, and reported happiness.

**Usage**

```r
data(happy)
```

**Format**

A data frame with 24 observations on the following 4 variables.

**Source**


**Examples**

```r
str(happy)
table(happy)
```

### headneck

**Head and Neck Cancer data**

**Description**

Data from a head and neck cancer study where time was discretized by one-month intervals.

**Usage**

```r
data(headneck)
```
Format

A data frame with 47 observations on the following 4 variables.

- **month** a numeric vector
- **atrisk** a numeric vector, number at risk
- **deaths** a numeric vector
- **withdrawals** a numeric vector

Source


Examples

```r
str(headneck)
summary(headneck)
with(headneck, {plot(month, atrisk, type="s");
    lines(month, deaths, type="s", col="red");
    lines(month, withdrawals, type="S", col="green"))
```

ohio

Air Pollution and Health

Description

Air Pollution and Health, annual data on children 7 to ten years old in Ohio.

Usage

data(ohio)

Format

A data frame with 32 observations on the following 6 variables.

- **a7** Presence (1) or absence (0) of respiratory infection
- **a8** Presence (1) or absence (0) of respiratory infection
- **a9** Presence (1) or absence (0) of respiratory infection
- **a10** Presence (1) or absence (0) of respiratory infection
- **mother.smoke** a factor with levels no yes
- **n** number of children
Details

Within the harvard Study of Air Pollution and Health, 537 children were examined annually from age 7 to 10, on the presence or absence of respiratory infection. So there are four repeated measurements on each child, or "short time series". The only available covariate is mothers smoking status at start of study.

Source


Examples

str(ohio)

summary(ohio)

Regensburg

Job Expectation

Description

A sample of psychology students was asked if they expected to find adequate employment after graduation.

Usage

data(Regensburg)

Format

A data frame with 30 observations on the following 4 variables.

y response categories
n number of students with this response in group
age age in years
lage natural log of age

Details

In a study on the perspectives of students, psychology students at the university of Regensburg have been asked if they expect to find an adequate employment after getting their degree. The response categories where ordered with respect to their expectation. Categories where "don’t expect adequate employment" - 1, "not sure" - 2, "immediately after the degree" - 3.

Source

**Examples**

```r
str(Regensburg)
summary(Regensburg)
# Example 3.5 page 83 in book:
library(MASS)
Regensburg$y <- ordered(Regensburg$y)
Regensburg.polr <- polr(y~lage, data=Regensburg, weights = n)
summary(Regensburg.polr)
class(Regensburg.polr)
```

---

**rheuma**

*Data from Patients with Acute Rheumatoid Arthritis*

---

**Description**

Data from patients with acute rheumatoid arthritis. A new agent was compared with an active control, and each patient was evaluated on a five-point assessment scale.

**Usage**

```r
data(rheuma)
```

**Format**

A data frame with 10 observations on the following 3 variables.

**Drug** a factor with levels `Active.control` `New.agent`

**Improvement** an ordered factor with levels `Much.worse` `Worse` `No.change` `Improved` `Much.improved`

**n** number of patients in group

**Details**

The global assessment in this example may be subdivided in the coarse response "improvement", "no change" and "worse". On a higher level improvement is split into "much improved" and "improved", while the "worse" category is split into "worse" and "much worse".

**Source**


**Examples**

```r
str(rheuma)
summary(rheuma)
```
Data Set of Tonsil Size in Children

Description

Children have been classified according to their relative tonsil size and wheater or not they are carriers of Streptococcus pyogenes.

Usage

data(tonsil)

Format

A data frame with 6 observations on the following 3 variables.

Streptococcus.p a factor with levels carriers noncarriers
Size numeric, 1, 2 or 3, tonsil size
n number of children in group

Details

It may be assumed that tonsil size always starts in the normal state "present but not enlarged" (category 1). If the tonsils grow abnormally, they may become "enlarged" (category 2), if the process does not stop, they may become "greatly enlarged" (category 3).

Source


Examples

str(tonsil)
summary(tonsil)
visual

Visual Impairment Data

Description

For 5199 individuals bivariate binary responses were observed, indicating wheater or not an eye was visually impaired, with covariates. The main objective is to analyze the influence of age and race on visual impairment, controlling for education, a surrogate for socioeconomic status. Data are only given individually for right and left eye, the bivariate response is lost.

Usage

data(visual)

Format

The format is: List of 2 $ left : 'data.frame': 16 obs. of 4 variables: ..$ left: Factor w/ 2 levels "no","yes": 2 1 2 1 2 1 2 1 ... ..$ race: Factor w/ 2 levels "black","white": 2 2 2 2 2 2 2 1 1 ... ..$ age : Factor w/ 4 levels "40-50","51-60",: 1 1 2 2 3 3 4 4 1 1 ... ..$ n : int [1:16] 15 617 24 557 42 789 139 673 29 750 ... $ right: 'data.frame': 16 obs. of 4 variables: ..$ right: Factor w/ 2 levels "no","yes": 2 1 2 1 2 1 2 1 ... ..$ race : Factor w/ 2 levels "black","white": 2 2 2 2 2 2 2 1 1 ... ..$ age : Factor w/ 4 levels "40-50","51-60",: 1 1 2 2 3 3 4 4 1 1 ... ..$ n : int [1:16] 19 613 25 556 48 783 146 666 31 748 ... 

Source


Examples

str(visual)
summary(visual)

wine

Bitterness of White Wines

Description

In a study on the bitterness of white wine it is of interest wheater treatments that can be controlleds during pressing the grapes influence the bitterness of wines. The two factors considered are the temperature and the admission of contact with skin when pressing the grapes.

Usage

data(wine)
Format

A data frame with 72 observations on the following 5 variables.

- **temp** a factor, temperature, with levels high low
- **contact** a factor with levels no yes
- **bottle** a factor with levels 1 2 3 4 5 6 7 8
- **judge** a factor with levels 1 2 3 4 5 6 7 8 9
- **score** numeric, ordinal score, from '1'=nonbitter to '5'=very bitter

Source


Examples

- `str(wine)`
- `summary(wine)`
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