Package ‘iccbeta’

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Type Package
Title Multilevel Model Intraclass Correlation for Slope Heterogeneity
Version 1.1.0
License GPL (>= 2)
Description A function and vignettes for computing an intraclass correlation described in Aguinis & Culpepper (2015) <doi:10.1177/1094428114563618>. This package quantifies the share of variance in a dependent variable that is attributed to group heterogeneity in slopes.

Imports Rcpp (>= 0.12.12)
LinkingTo Rcpp (>= 0.12.12), RcppArmadillo (>= 0.7.800)
Depends R (>= 3.2.0)
Suggests lme4, RLRsim

URL https://github.com/tmsalab/iccbeta

BugReports https://github.com/tmsalab/iccbeta/issues
RoxygenNote 6.0.1

NeedsCompilation yes

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iccbeta-package  iccbeta: Multilevel Model Intraclass Correlation for Slope Heterogeneity

Description
A function and vignettes for computing an intraclass correlation described in Aguinis & Culpepper (2015) <doi:10.1177/1094428114563618>. This package quantifies the share of variance in a dependent variable that is attributed to group heterogeneity in slopes.

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References

See Also
Useful links:
  • https://github.com/tmsalab/iccbeta
  • Report bugs at https://github.com/tmsalab/iccbeta/issues

Examples
## Not run:
if(requireNamespace("lme4") & requireNamespace("RLRsim")){
  # Simulated Data Example
data(simICCdata)
library('lme4')

  # computing icca
  vy <- var(simICCdata$Y)
lmm0 <- lmer(Y ~ (1|l2id), data = simICCdata, REML = FALSE)
  VarCorr(lmm0)$l2id[1,1]/vy

  # Create simICCdata2
  grp_means = aggregate(simICCdata[c('X1','X2')], simICCdata['l2id'],mean)
colnames(grp_means)[2:3] = c('m_X1','m_X2')
  simICCdata2 = merge(simICCdata,grp_means,by='l2id')
}
Hofmann

A multilevel dataset from Hofmann, Griffin, and Gavin (2000).

Description

A multilevel dataset from Hofmann, Griffin, and Gavin (2000).
Usage

Hofmann

Format

A data frame with 1,000 observations and 7 variables.

id  a numeric vector of group ids.
helping  a numeric vector of the helping outcome variable construct.
mood  a level 1 mood predictor.
mood_grp_mn  a level 2 variable of the group mean of mood.
cohesion  a level 2 covariate measuring cohesion.
mood_grp_cent  group-mean centered mood predictor.
mood_grd_cent  grand-mean centered mood predictor.

Source


References


See Also

lmer, model.matrix, VarCorr, LRTSim, simICCdata

Examples

## Not run:

if(requireNamespace("lme4") && requireNamespace("RLRsim")){
data(Hofmann)
library("lme4")

# Random-Intercepts Model
lmmHofmann0 = lmer(helping ~ (1|id), data = Hofmann)
vy_Hofmann = var(Hofmann[,,'helping'])

# Computing icca
VarCorr(lmmHofmann0)$id[1,1]/vy_Hofmann

# Estimating Group-Mean Centered Random Slopes Model, no level 2 variables
lmmHofmann1  <- lmer(helping ~ mood_grp_cent + (mood_grp_cent | id),
**icc_beta**

Intraclass correlation used to assess variability of lower-order relationships across higher-order processes/units.

**Description**

A function and vignettes for computing the intraclass correlation described in Aguinis & Culpepper (2015). icc_beta quantifies the share of variance in an outcome variable that is attributed to heterogeneity in slopes due to higher-order processes/units.

**Usage**

```
icc_beta(X, l2id, T, vy)
```

**Arguments**

- `X`  
  The design matrix of fixed effects from a lmer model.

- `l2id`  
  A vector that identifies group membership. The vector must be coded as a sequence of integers from 1 to J, the number of groups.

- `T`  
  A matrix of the estimated variance-covariance matrix of a lmer model fit.

- `vy`  
  The variance of the outcome variable.

**Value**

- `vy`  
  The variance of the dependent variable.
Author(s)

Steven A Culpepper

References


See Also

lmer, model.matrix, VarCorr, LRTSim, Hofmann, simICCdata

Examples

```r
## Not run:

if(requireNamespace("lme4") & requireNamespace("RLRsim")){
  # Simulated Data Example from Aguinis & Culpepper (2015)
  data(simICCdata)
  library("lme4")

  # Computing icca
  vy <- var(simICCdata$Y)
  lmm0 <- lmer(Y ~ (1 | l2id), data = simICCdata, REML = FALSE)
  VarCorr(lmm0)$l2id[1, 1]/vy

  # Create simICCdata2
  grp_means = aggregate(simICCdata[c('X1', 'X2')], simICCdata['l2id'], mean)
  colnames(grp_means)[2:3] = c('m_X1', 'm_X2')
  simICCdata2 = merge(simICCdata, grp_means, by='l2id')

  # Estimating random slopes model
  lmm1 <- lmer(Y ~ I(X1-m_X1) + I(X2-m_X2) + (I(X1-m_X1) + I(X2-m_X2) | l2id),
               data = simICCdata2, REML = FALSE)
  X <- model.matrix(lmm1)
  p <- ncol(X)
  T1 <- VarCorr(lmm1)$l2id[1:p, 1:p]

  # Computing iccb
  # Notice '+1' because icc_beta assumes l2ids are from 1 to 30.
  icc_beta(X, simICCdata2$l2id+1, T1, vy)$rho_beta

  # Hofmann et al. (2000) Example
  data(Hofmann)
  library("lme4")

  # Random-Intercepts Model
  lmmHofmann0 = lmer(helping ~ (1|id), data = Hofmann)
  vy_Hofmann = var(Hofmann[, 'helping'])

  # Computing icca
```
A simulated data example from Aguinis and Culpepper (2015) to demonstrate the `icc_beta` function for computing the proportion of variance in the outcome variable that is attributed to heterogeneity in slopes due to higher-order processes/units.

Usage

`simICCdata`

Format

A data frame with 900 observations (i.e., 30 observations nested within 30 groups) on the following 6 variables.

- `l1id` A within group ID variable.
- `l2id` A group ID variable.
- `one` A column of 1’s for the intercept.
- `X1` A simulated level 1 predictor.
X2  A simulated level 1 predictor.
Y  A simulated outcome variable.

Details

See Aguinis and Culpepper (2015) for the model used to simulate the dataset.

Source


See Also

lmer, model.matrix, VarCorr, LRTSim, Hofmann

Examples

```r
## Not run:            
data(simICCdata)
if(requireNamespace("lme4")){
  library("lme4")

  # computing icca
  vy <- var(simICCdata$Y)
  lmm0 <- lmer(Y ~ (1|l2id), data = simICCdata, REML = FALSE)
  VarCorr(lmm0)$l2id[1,1]/vy

  # Create simICCdata2
  grp_means = aggregate(simICCdata[c('X1','X2')], simICCdata['l2id'],mean)
  colnames(grp_means)[2:3] = c('m_X1','m_X2')
  simICCdata2 = merge(simICCdata, grp_means, by='l2id')

  # Estimating random slopes model
  lmm1 <- lmer(Y ~ I(X1-m_X1) + I(X2-m_X2) + I(X1-m_X1) + I(X2-m_X2) | l2id),
              data = simICCdata2, REML = FALSE)
  X <- model.matrix(lmm1)
  p <- ncol(X)
  T1 <- VarCorr(lmm1) $l2id[1:p,1:p]
  # computing iccb
  # Notice '+1' because icc_beta assumes l2ids are from 1 to 30.
  icc_beta(X, simICCdata2$l2id+1, T1, vy)$rho_beta
} else {
  stop("Please install 'lme4' to run the above example.")
}

## End(Not run)
```
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