Package ‘mitools’

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Title  Tools for multiple imputation of missing data

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Description Tools to perform analyses and combine results from multiple-imputation datasets.

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Suggests RODBC, DBI, foreign

License GPL-2

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imputationList

Constructor for imputationList objects

Description

Create and update imputationList objects to be used as input to other MI routines.

Usage

imputationList(datasets,...)

## Default S3 method:
imputationList(datasets,...)

## S3 method for class 'character'
imputationList(datasets,dbtype,dbname,...)

## S3 method for class 'imputationList'
update(object,...)

## S3 method for class 'imputationList'
rbind(...)

## S3 method for class 'imputationList'
cbind(...)

Arguments

datasets a list of data frames corresponding to the multiple imputations, or a list of names of database tables or views

dbtype "ODBC" or a database driver name for DBI::dbDriver()

dbname Name of the database

object An object of class imputationList

... Arguments tag=expr to update will create new variables tag by evaluating expr in each imputed dataset. Arguments to imputationList() are passed to the database driver

Details

When the arguments to imputationList() are character strings a database-based imputation list is created. This can be a database accessed through ODBC with the RODBC package or a database with a DBI-compatible driver. The dbname and ... arguments are passed to dbConnect() or odbcConnect() to create a database connection. Data are read from the database as needed.

For a database-backed object the update() method creates variable definitions that are evaluated as the data are read, so that read-only access to the database is sufficient.

Value

An object of class imputationList or DBimputationList
Examples

```r
## Not run:
## CRAN doesn't like this example
data.dir <- system.file("data", package="mitools")
files.men <- list.files(data.dir, pattern="m\..dta\$, full=TRUE)
men <- imputationList(lapply(files.men, foreign::read.dta))
files.women <- list.files(data.dir, pattern="f\..dta\$, full=TRUE)
women <- imputationList(lapply(files.women, foreign::read.dta))
men <- update(men, sex=1)
women <- update(women, sex=0)
all <- rbind(men, women)
all <- update(all, drinkreg=as.numeric(drkfre)>2)
all

## End(Not run)
```

---

**MImultiply inference**

**Description**

Combines results of analyses on multiply imputed data sets. A generic function with methods for `imputationResultList` objects and a default method. In addition to point estimates and variances, `MImultiply` computes Rubin's degrees-of-freedom estimate and rate of missing information.

**Usage**

```r
MImultiply(results, ...)  
## Default S3 method:  
MImultiply(results, variances, call=sys.call(), df.complete=Inf,...)  
## S3 method for class 'imputationResultList'  
MImultiply(results, call=NULL, df.complete=Inf,...)
```

**Arguments**

- `results`: A list of results from inference on separate imputed datasets
- `variances`: If `results` is a list of parameter vectors, `variances` should be the corresponding variance-covariance matrices
- `call`: A function call for labelling the results
- `df.complete`: Complete-data degrees of freedom
- `...`: Other arguments, not used
Details

The results argument in the default method may be either a list of parameter vectors or a list of objects that have coef and vcov methods. In the former case a list of variance-covariance matrices must be supplied as the second argument.

The complete-data degrees of freedom are used when a complete-data analysis would use a t-distribution rather than a Normal distribution for confidence intervals, such as some survey applications.

Value

An object of class MIresult with summary and print methods

References

~put references to the literature/web site here ~

See Also

MIextract, with.imputationList

Examples

data(smi)
models<-with(smi, glm(drinkreg~wave*sex,family=binomial()))
summary(MIcombine(models))

betas<-MIextract(models, fun=coef)
vars<-MIextract(models, fun=vcov)
summary(MIcombine(betas, vars))

MIextract Extract a parameter from a list of results

Description

Used to extract parameter estimates and standard errors from lists produced by with.imputationList.

Usage

MIextract(results, expr, fun)

Arguments

results A list of objects
expr an expression
fun a function of one argument
Details

If expr is supplied, it is evaluated in each element of results. Otherwise each element of results is passed as an argument to fun.

Value

A list

See Also

with.imputationList, MIcombine

Examples

data(smi)
models<-with(smi, glm(drinkreg~wave*sex,family=binomial()))

betas<-MIextract(models,fun=coef)
vars<-MIextract(models, fun=vcov)
summary(MIcombine(betas,vars))

---

smi                      Multiple imputations

Description

An imputationList object containing five imputations of data from the Victorian Adolescent Health Cohort Study.

Usage

data(smi)

Format

The underlying data are in a data frame with 1170 observations on the following 12 variables.

- id  a numeric vector
- wave  a numeric vector
- mmetro  a numeric vector
- parsmk  a numeric vector
- drkfre  a factor with levels Non drinker not in last wk <3 days last wk >=3 days last wk
- alcdos  a factor with levels Non drinker not in last wk av <5units/drink_day av =>5units/drink_day
- alcdhi  a numeric vector
- smk  a factor with levels non/ex-smoker <6 days 6/7 days
- cistot  a numeric vector
with.imputationList

- mdrkfre a numeric vector
- sex a numeric vector
- drinkreg a logical vector

Source

Examples

```r
data(smi)
with(smi, table(sex, drkfre))
model1<-with(smi, glm(drinkreg~wave*sex, family=binomial()))
Mcombine(model1)
summary(Mcombine(model1))
```

with.imputationList  Evaluate an expression in multiple imputed datasets

Description
Performs a computation of each of imputed datasets in data

Usage

```r
## S3 method for class 'imputationList'
with(data, expr, fun, ...)
```

Arguments
- data An imputationList object
- expr An expression
- fun A function taking a data frame argument
- ... Other arguments, passed to fun

Details
If expr is supplied, evaluate it in each dataset in data; if fun is supplied, it is evaluated on each dataset. If all the results inherit from "imputationResult" the return value is an imputationResultList object, otherwise it is an ordinary list.

Value
Either a list or an imputationResultList object
with.imputationList

See Also

imputationList

Examples

data(smi)
models<-with(smi, glm(drinkreg~wave*sex,family=binomial()))
tables<-with(smi, table(drkfre,sex))
with(smi, fun=summary)
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