

# Package ‘eat’

March 4, 2012

**Type** Package

**Title** eat

**Version** 1.4.10

**Depends** R(>= 2.14.0), sendmailR, gdata, xlsx, car, reshape, foreign,date, plyr, parallel

**Date** 2012-03-04

**Author** eat authors <eat-commits@lists.r-forge.r-project.org>

**Maintainer** Martin Hecht <martin.hecht@iqb.hu-berlin.de>

**Description** The package eat is designed to simplify data preparation and IRT modeling with the software ConQuest within the R programming environment. It includes routines for automation of data preprocessing and an interface to specify and run several IRT models.

**License** GPL

**LazyLoad** yes

**LazyData** yes

## R topics documented:

eat-package	2
aggregateData	3
asNumericIfPossible	4
automateConquestModel	5
automateDataPreparation	8
automateModels	10
bi.linking	12
checkData	13
checkInput	14
checkLink	15
collapseMissings	15
commonItems	16
ConQuest.Log.Example1.log	17
crop	17
detect.suppression	18
dichotomize	19
exploreDesign	20

get.dsc . . . . .	21
get.equ . . . . .	21
get.history . . . . .	22
get.itn . . . . .	23
get.plausible . . . . .	23
get.q3 . . . . .	24
get.shw . . . . .	24
get.wle . . . . .	26
getConquestVersion . . . . .	26
inputDat . . . . .	27
inputList . . . . .	27
loadSav . . . . .	29
long2matrix . . . . .	30
makeCodebookInput . . . . .	32
makeInputLists . . . . .	32
makeNumeric . . . . .	33
mergeData . . . . .	34
prepare.package . . . . .	35
readDaemonXlsx . . . . .	35
recodeData . . . . .	36
reinsort.col . . . . .	37
rmNA . . . . .	38
rmNAcols . . . . .	38
rmNArows . . . . .	40
science1 . . . . .	41
science1.context.vars . . . . .	41
science1.items . . . . .	42
science1.scales . . . . .	42
set.col.type . . . . .	42
sortDfrByNames . . . . .	43
source.it.all . . . . .	44
source.it.all2 . . . . .	44
sunk . . . . .	45
writeSpss . . . . .	46
yen.q3 . . . . .	47

<b>Index</b>	<b>48</b>
--------------	-----------

---

eat-package	<i>eat-package</i>
-------------	--------------------

---

## Description

More about what it does (maybe more than one line) ~~ A concise (1-5 lines) description of the package ~~

Details

Package: eat  
Type: Package  
Version:  
Date:  
License: What license is it under?  
LazyLoad: yes

~~ An overview of how to use the package, including the most important functions ~~

Author(s)

Who wrote it  
Maintainer: Who to complain to <yourfault@somewhere.net> ~~ The author and/or maintainer of the package ~~

References

~~ Literature or other references for background information ~~

---

aggregateData	<i>Aggregate Datasets with Missing Values</i>
---------------	---

---

Description

Aggregates datasets with constraints on missing values

Usage

aggregateData(dat, subunits, units, aggregatemissings = "use.default", rename = FALSE, recodedData

Arguments

dat	A data frame.
subunits	A data frame with subunit information. See 'Details'.
units	A data frame with unit information. See 'Details'.
aggregatemissings	Either the character string "use.default" or a $n \times n$ matrix with information on how missing values should be aggregated. See 'Details'.
rename	Should units with only one subunit be renamed to their unit name? Default is FALSE.
recodedData	Logical indicating whether colnames in dataset to aggregate are the subunit names (as in subunits\$subunit) or recoded subunit names (as in subunits\$subunitRecoded). Default is TRUE, meaning that colnames are recoded subitem names.

## Details

aggregateData aggregates units in data frames with special consideration of missing values. The aggregation of missing values is specified in argument aggregatemissings.

The results of aggregateData will be written to a protocol file with sunk.

Examples of data frames subunits and units can be found via data(inputList).

## Value

A data frame with aggregated units and, if rename = TRUE, renamed subunits.

## Warning

Missings are only correctly aggregated if their values correspond to the values given in aggregatemissings. aggregateData does not check for value types or whether codes are valid. Use of checkData and recodeData before using aggregateData is therefore strongly recommended.

## Author(s)

Nicole Haag, Anna Lenski

## References

For missing types see <http://code.google.com/p/zkdlb/wiki/MissingHandling>

## See Also

[recodeData](#), [checkData](#)

## Examples

```
data(inputDat)
data(inputList)

dat1 <- inputDat[[1]] # get first dataset from inputDat
datRec <- recodeData(dat1, inputList$values, inputList$subunits) # recode Data first
datAggr <- aggregateData(datRec, inputList$subunits, inputList$units, rename = TRUE, recodedData = TRUE)
```

---

asNumericIfPossible      *Transform columns of a data.frame into numeric values if possible*

---

## Description

In contrast to as.numeric, Function transforms only "transformable" columns of a data.frame into numeric values (i.e. without creating NA when transformation fails. Non-transformable columns are maintained. Optionally, only a logical vector is given, indicating which columns are transformable.

## Usage

```
asNumericIfPossible ( dataframe, set.numeric = TRUE, transform.factors = FALSE, maintain.factor.
```

## Arguments

<code>dataFrame</code>	A data.frame which columns should be transformed.
<code>set.numeric</code>	Logical: If TRUE, data.frame with transformed columns is returned. If FALSE, a logical vector is returned, indicating which columns are transformable.
<code>transform.factors</code>	Logical: Should columns of class factor transformed? If FALSE, columns of class factor are maintained. If TRUE, columns of class factor are attempted to transform.
<code>maintain.factor.scores</code>	Logical. Only relevant if <code>transform.factors = TRUE</code> . If TRUE, the nominal values of the factor are transformed if possible. If FALSE, the integer numbers representing the factors' nominal values are returned. See details.
<code>verbose</code>	Logical: If TRUE, informations about the class of the columns in the data.frame are printed to the console.

## Details

In R, factors may represent ordered categories or nominal variables. Depending on the meaning of the variable, a transformation of the nominal values (of a factor variable) to numeric values may be desirable or not. The arguments `transform.factors` and `maintain.factor.scores` serve to specify if and how factor variables should be transformed. See examples.

## Value

Either a logic vector, indicating which columns in the data.frame are transformable according to the specified conditions, ora data.frame in which transformable columns are transformed.

## Author(s)

Sebastian Weirich

## Examples

```
( dat <- data.frame( X1 = c("1",NA,"0"), X2 = c("a",NA,"b"), X3 = c(TRUE,FALSE,FALSE), X4 = as.factor(
str(dat)
asNumericIfPossible(dat)
asNumericIfPossible(dat, transform.factors=TRUE, maintain.factor.scores=FALSE)
asNumericIfPossible(dat, transform.factors=TRUE, maintain.factor.scores=TRUE)
```

---

automateConquestModel *automateConquestModel*

---

## Description

Wrapper function which calls several functions to build and write Conquest input files.

## Usage

```
automateConquestModel(dataset, ID, regression=NULL, DIF=NULL, group.var=NULL,
weight=NULL, testitems, na=list(items=NULL, DIF=NULL, HG=NULL, group=NULL,
weight=NULL), person.grouping=NULL, item.grouping=NULL, model.statement="item",
m.model="1pl", Title = NULL, jobName, jobFolder, subFolder=list(), dataName=NULL,
anchor=NULL, pathConquest, method=NULL, std.err=NULL, distribution=NULL,
n.plausible=NULL, set.constraints=NULL, nodes=NULL, p.nodes=NULL, f.nodes=NULL,
n.iterations=NULL, converge=NULL, deviancechange=NULL, name.unidim=NULL,
equivalence.table="wle", use.letters=FALSE, checkLink=FALSE, verbose = TRUE)
```

## Arguments

dataset	data.frame containing all variables necessary for analysis
ID	name or column number of 'id' variable
regression	character vector with names or integer vector with column numbers of one or more 'context' variables ( e.g. sex, school , ... )
DIF	character string with name or scalar with column number of only one variable denominating groups for which analysis of differential item functioning is to be done ( e.g. sex, class , ... )
group.var	character vector with names or integer vector with column numbers of one or more 'group' variables ( e.g. sex, school , ... )
weight	character string with name or scalar with column number of only one 'weighting' variable
testitems	character vector with names or integer vector with column numbers of 'item' variables ( e.g. sex, school , ... )
na	List of numerical vector including numbers to be considered as 'sysmis'. Specific missing codes can be defined for each type of variable, e.g. testitems, DIF variables, ...
item.grouping	data.frame with grouping information of items, first column must be 'item' which includes item names, further columns contain scale definitions, 0 indicates that the respective item is NOT part of the scale, 1 indicates that this item is part of the scale, colnames of columns are the names of the scales
person.grouping	data.frame with grouping information of persons, first column must be the name of 'id' (e.g. idstud), further columns contain group definitions, 0 indicates that the respective person is NOT part of the group, 1 indicates that this person is part of the group, colnames of columns are the names of the groups
model.statement	character string which appears in Conquest Syntax as model statement. Set to item by default. When DIF variable is specified, statement is set to item - [name of DIF variable] + item*[name of DIF variable] by default. However, user's specification of model.statement overwrites default in each case.
m.model	character string specifying the IRT model used for analysis. At the time, only "1PL" is available.
Title	optional: character string with title of analysis which appears in Conquest Syntax. If no title is specified, informations about computer and user name and R version are printed in Conquest Syntax.

jobName	character string specifying name of analysis. All Conquest input and output files will named by jobName and their corresponding suffixes.
jobFolder	character string specifying the folder where all analysis files will be generated, for example "C:/programme/analysis"
subFolder	optional: List of character strings specifying maximal 2 optional subfolders relative to jobFolder for the data and the output files. Character strings must be named with data and out, for example subFolder=list(data="../dataset/analysis1", out="../output/analysis1") Double dots .. indicates to move one level above in folder structure. For example, if jobFolder is "C:/programme/analysis" and subFolder is list(data="../dataset/analysis1", out="../output/analysis1"), dataset is written to "C:/programme/dataset/analysis1" and output is written to "C:/output/analysis1". When subFolder\$data == NULL, dataset is written to the folder specified by jobFolder. Same is true for subFolder\$out == NULL.
dataName	optional: character string specifying name of dataset if intend to differ from name specified by jobName. When dataName == NULL, dataset is named [jobName].dat
anchor	optional: data frame with anchor parameters. First column of anchor refers to item name, second columns refers to parameter used as reference for anchoring. Note: not all items in the data.frame have to occur as anchor parameters in the anchor data frame, as well as not all items in the anchor frame have to occur in the data frame.
pathConquest	character string with path and name of Conquest console, for example "c:/programme/conquest/co
method	optional: character string with method for analysis. Possible options are "gauss" (default), "quadrature", "montecarlo". See Conquest manual, pp.225.
std.err	optional: character string specifying types of standard errors to be estimated. Possible options are "full", "quick" (default), "none". See Conquest manual, pp.167.
distribution	optional: character string with a priori trait distribution. Possible options are "normal" (default), "discrete". See Conquest manual, pp.167.
n.plausible	optional: integer scalar specifying numbers of plausible values to draw. Default is 5.
set.constraints	optional: character string specifying the constraints of the scale. Possible options are "cases" (default), "items", "none". When anchor parameter are specified in anchor, constraints will set to "none" in each case.
nodes	optional: integer scalar specifying numbers of nodes in analysis. Default is 15.
p.nodes	optional: integer scalar specifying numbers of p nodes in analysis. Sets the number of nodes that are used in the approximation of the posterior distributions, which are used in the drawing of plausible values and in the calculation of EAP estimates. The default is 2000.
f.nodes	optional: integer scalar specifying numbers of f nodes in analysis. Sets the number of nodes that are used in the approximation of the posterior distributions in the calculation of fit statistics. The default is 2000.
n.iterations	optional integer scalar. Sets the maximum number of iterations for which estimation will proceed without improvement in the deviance. The minimum value permitted is 5. The default value is 20.
converge	optional scalar. Instructs estimation to terminate when the largest change in any parameter estimate between successive iterations of the EM algorithm is less than converge. The default value is 0.0001.

deviancechange	optional scalar. Instructs estimation to terminate when the change in the deviance between successive iterations of the EM algorithm is less than deviancechange. The default value is 0.0001.
name.unidim	optional: character string with name of one latent dimension, if not specified in labels.
equivalence.table	optional: character string specifying type of equivalence table to print. Possible options are "wle" (default), "mle" or NULL.
use.letters	logical: Should values coded als letters? May be relevant only in partial credit models comprising items with more than 10 categories to avoid columns with width 2 in Conquest.
checkLink	logical: If TRUE, items in dataset are checked for being connected with each other via design (function <a href="#">checkLink</a> is called)
verbose	logical: If TRUE, messages are printed on console.

### Value

No results are returned to console. Input files and batch string are written to disk in specified folder(s).

### Author(s)

Sebastian Weirich, Karoline Sachse, Martin Hecht

---

automateDataPreparation  
*automateDataPreparation*

---

### Description

prepare datasets for [automateModels](#)

### Usage

```
automateDataPreparation( inputDat = NULL, inputList, path = NULL, loadSav,
  checkData, mergeData, recodeData, aggregateData, scoreData, writeSpss,
  filedat = "zkddata.txt", filesps = "readZkdData.sps",
  aggregatemissings = "use.default", rename = TRUE, recodedData = TRUE,
  correctDigits=FALSE, truncateSpaceChar = TRUE, newID = NULL, oldIDs = NULL,
  missing.rule = list(mvi=0, mnrr=0, mci=0, mbd=NA, mir=0, mbi=0))
```

### Arguments

inputDat	A list of data frames if no .sav files shall be read in.
inputList	A list of data frames containing additional information (see Details).
path	A character string containing the path where the logfolder will be created. Also required by <a href="#">loadSav</a> (source of SPSS files) and <a href="#">writeSpss</a> . Default is the current R working directory.
loadSav	logical (whether function <a href="#">loadSav</a> shall be called).



checkData	logical (whether function <a href="#">checkData</a> shall be called).
mergeData	logical (whether function <a href="#">mergeData</a> shall be called).
recodeData	logical (whether function <a href="#">recodeData</a> shall be called for subunits).
aggregateData	logical (whether function <a href="#">aggregateData</a> shall be called).
scoreData	logical (whether function <a href="#">recodeData</a> shall be called for units).
writeSpss	logical (whether function <a href="#">writeSpss</a> shall be called).
filedat	A character string with the name of the output data file required by <a href="#">writeSpss</a> .
filesps	A character string with the name of the output syntax file required by <a href="#">writeSpss</a> .
missing.rule	A list containing recode information for character missings required by <a href="#">writeSpss</a> . See 'References' for description of default values.
aggregatemissings	A character string. Either "use.default" or "seeInputList", if pattern was specified in inputList\$aggrMiss.
rename	logical. See <a href="#">aggregateData</a> .
recodedData	logical. See <a href="#">aggregateData</a> .
correctDigits	logical. See <a href="#">loadSav</a> .
truncateSpaceChar	logical. See <a href="#">loadSav</a> .
newID	A character string containing the case IDs name in the final data frame. Default is "ID" or a character string specified in inputList sheet 6 (see <a href="#">readDaemonXlsx</a> ).
oldIDs	A vector of character strings containing the IDs names in the original datasets. Default is as specified in inputList\$savFiles.

## Details

inputList is a list of data frames. It can be created either by ZKDaemon via [readDaemonXlsx](#) or by [makeInputLists](#). Compulsory: units, subunits, values. Optional: unitRecodings, savFiles, newID, aggregateMissings.

## Value

A single data frame in last transformation status.

## Author(s)

Karoline Sachse

## References

<http://code.google.com/p/zkdlb/wiki/MissingHandling>

## Examples

```
inpList <- inputList
inpDat <- inputDat
test <- automateDataPreparation (inputList=inpList, inputDat = inpDat,
                                path = "c:/temp/test_eat", loadSav = FALSE, checkData=TRUE,
                                mergeData = TRUE, recodeData=TRUE, aggregateData=TRUE, scoreData= TRUE,
                                writeSpss=TRUE)
```

---

 automateModels

*automateModels*


---

## Description

specify and run several ConQuest models

## Usage

```
automateModels(dataset, id = NULL, context.vars = NULL, items = NULL,
  item.grouping = NULL, select.item.group = NULL, person.grouping.vars = NULL,
  person.grouping.vars.include.all = FALSE, person.grouping = NULL,
  select.person.group = NULL, checkLink = FALSE, additional.item.props = NULL, folder,
  overwrite.folder = TRUE, analyse.name.prefix = NULL, analyse.name = NULL,
  analyse.name.elements = NULL, data.name = NULL, m.model = NULL, software = NULL,
  dif = NULL, weight = NULL, anchor = NULL, regression = NULL,
  adjust.for.regression = FALSE, q3 = FALSE, missing.rule = NULL, cross = NULL,
  subfolder.order = NULL, subfolder.mode = NULL, allNAdelate = TRUE, additionalSubFolder = NULL,
  run.mode = NULL, n.batches = NULL, run.timeout = 1440, run.status.refresh = 0.2,
  all.local.cores = TRUE, email = NULL, smtpServer = NULL, write.txt.dataset = FALSE,
  write.xls.results = TRUE,
  delete.folder.countdown = 5, conquestParameters = NULL )
```

## Arguments

dataset	data.frame containing all variables type of variables ("id" , "context.vars" or "items") must be set using options id, context.vars, items
id	name or column number of 'id' variable in dataset
context.vars	names or column numbers of 'context' variables ( e.g. sex, school , ... ) in dataset
items	names or column numbers of 'item' variables in dataset if omitted, all variables that are not classified as 'id' or 'context' variables are treated as 'items'
item.grouping	data.frame with grouping information of items, first column must be 'item' which includes item names, further columns contain scale definitions, 0 indicates that the respective item is NOT part of the scale, 1 indicates that this item is part of the scale, colnames of columns are the names of the scales
select.item.group	character vector of scale names chosen for analysis
person.grouping.vars	character vector of 'context' variables in dataset which are used to automatically generate 'person.grouping', each category is transformed into the 'person.grouping' format
person.grouping.vars.include.all	logical vector (along person.grouping.vars), indicates whether to generate a variable 'all' for the specific variable
person.grouping	data.frame with grouping information of persons, first column must be the name of 'id' (e.g. idstud), further columns contain group definitions, 0 indicates that the respective person is NOT part of the group, 1 indicates that this person is part of the group, colnames of columns are the names of the groups

<code>select.person.group</code>	character vector of group names chosen for analysis
<code>checkLink</code>	logical: If TRUE, items in dataset are checked for being connected with each other via design (function <a href="#">checkLink</a> is called) 23.02.2012: not yet implemented
<code>additional.item.props</code>	data.frame of additional item information to be merged to model results, first column must be 'item' and contain item names
<code>folder</code>	folder to write output into
<code>overwrite.folder</code>	logical, if TRUE (default), folder is completely emptied
<code>analyse.name.prefix</code>	prefix (e.g. "pilotStudy") to be attached to all analyses names
<code>analyse.name</code>	analyses names are usually automatically set, if you want to set them manually use this option
<code>analyse.name.elements</code>	analyses names are set automatically using these elements: c ( "scale" , "group" , "dif" , "regression" , "anchor" ), use this option to change composition and order of the analyses names generation
<code>data.name</code>	optional: character string specifying name of dataset if intend to differ from name specified by jobName. When <code>dataName == NULL</code> , dataset is named [job-Name].dat
<code>m.model</code>	measurement model, "1pl" (default), "2pl", "3pl", "4pl"
<code>software</code>	"conquest" (default) no other software implemented yet
<code>dif</code>	variable that is used for differential item functioning
<code>weight</code>	case weight variable
<code>anchor</code>	data.frame with anchor information
<code>regression</code>	variable(s) that is/are used
<code>adjust.for.regression</code>	if TRUE item parameters (difficulty) are centered on the mean of the entire sample if FALSE (default) item parameters (difficulty) are centered on the mean of the regression reference group
<code>q3</code>	Logical: If TRUE, Yen's Q3 statistic is computed.
<code>missing.rule</code>	definition how to recode distinct missings in dataset
<code>cross</code>	scales in 'item.grouping' and groups in 'person.grouping' can be crossed to define distinct analyses "all": scales and groups are crossed "item.groups", scales are separately (unidimensional) run (instead of one multidimensional model) "person.groups", person groups are separately (single group) run (instead of one multigroup model)
<code>subfolder.order</code>	subfolders are automatically generated in this order c ( "i.model" , "p.model" , "m.model" , "software" , "dif" , "regression" , "anchor" )
<code>subfolder.mode</code>	"none": no subfolders are created "full": complete subfolders are created according to 'subfolder.order' "intelligent" (default): meaningful subfolders are created
<code>allNAdelete</code>	if TRUE all cases with complete missings on items are removed, if FALSE these cases are not deleted Note: this is a global option, that is set for all modelss

additionalSubFolder  
specification for 'data' and 'out' subfolder (constant over all analyses)

run.mode  
"serial": serial runs on local machine "parallel": batch files must be started manually (e.g. on several machines)

n.batches  
number of batch files that are created, batch files contain one or more analyses

run.timeout  
minutes to wait for analyses to finish, default: 1440 (24h)

run.status.refresh  
time for console refresh of model run status, default: 0.2 (12sec)

all.local.cores  
if TRUE and run.mode="serial" all cores of local machine are used for analysis

email  
set email address to receive an email when analyses are finished or time's up

smtpServer  
smtpServer for sending emails, default: "mailhost.cms.hu-berlin.de"

write.txt.dataset  
write out datasets as ascii, default: FALSE

write.xls.results  
if TRUE (default) results are written to Excel files

delete.folder.countdown  
countdown for deletion of 'folder', default: 5 (seconds)

conquestParameters  
Set ConQuest parameters as a named list.  
Available option are:  
"pathConquest", "method", "std.err", "distribution", "n.plausible", "set.constraints",  
"nodes", "p.nodes", "f.nodes", "n.iterations", "converge", "deviancechange", "equivalence.table", "use.letters", "na", "model.statement"  
See [automateConquestModel](#) documentation for details.

### Details

To run several models list parameters as corresponding lists Explicitly list NULL if parameter should not be set or be defaulted See examples

### Value

returns results in specific format

### Author(s)

Martin Hecht, Karoline Sachse, Sebastian Weirich, Christiane Penk, Malte Jansen, Sebastian Wurster

---

bi.linking

*bi.linking*

---

### Description

Links results from several analysis. Each analysis is linked with each other.

### Usage

```
bi.linking ( results , scales=NULL , folder=NULL , file.name=NULL , method = NULL , lower.triang
```

**Arguments**

results	result list from automateModels run
scales	Character vector of scales for which linking should separately done. If NULL, all analysis in the results list are linked. Note: due to suboptimalities in development process, analysis name must contain scale!!
folder	output folder, will be emptied!
file.name	file.name for output excel, default: "bi.linking.results.xlsx"
method	set linking method to either "Mean-Mean" , "Haebara" or "Stocking-Lord" (default)
lower.triangle	set reference groups for the linking

**Value**

writes linking results to excel file. returns linking results as list.

**Author(s)**

Martin Hecht

---

checkData

*Check Datasets for Missing Values and Invalid Codes*

---

**Description**

Check data frames for missing or duplicated entries in the ID variable, persons and/or variables without valid codes, and invalid codes. Invalid codes are codes which are not specified in table values.

**Usage**

```
checkData (dat, values, subunits, units)
```

**Arguments**

dat	A data frame
values	A data frame with code information. See 'Details'.
subunits	A data frame with subunit information. See 'Details'.
units	A data frame with unit information. See 'Details'.

**Details**

The results of checkData will be written to a protocol file with sunk.

Examples of data frames values, subunits and units can be found via data(inputList).

**Value**

Used for its side effects. The return value is NULL.

**Author(s)**

Nicole Haag, Anna Lenski

**References**

For missing types see <http://code.google.com/p/zkdlb/wiki/MissingHandling>

**See Also**

[sunk](#)

---

checkInput	<i>Check Input Data Frames</i>
------------	--------------------------------

---

**Description**

Check input data frames for consistency and replace missing information with default values (if necessary).

**Usage**

```
checkInput(values, subunits, units, checkValues = TRUE, checkUnits = TRUE)
```

**Arguments**

values	A data frame with code information. See 'Details'
subunits	A data frame with subunit information. See 'Details'
units	A data frame with unit information. See 'Details'.
checkValues	Logical: Should data frame values be checked?
checkUnits	Logical: Should data frame units be checked?

**Details**

This function is largely for internal use and is called by `makeInputLists` before lists are generated. Examples of data frames `values`, `subunits` and `units` can be found via `data(inputList)`.

**Value**

A list containing the checked and (if necessary) defaulted input data frames:

values	Checked data frame with code information. Will be returned if <code>checkValues = TRUE</code> .
subunits	A data frame with subunit information.
units	A data frame with unit information. Will be returned if <code>checkUnits = TRUE</code> .

**Warning**

Function will not check input data frames if `checkValues` and `checkUnits` are both `FALSE`.

**Author(s)**

Nicole Haag

**See Also**[makeInputLists](#)

---

checkLink*checkLink*

---

**Description**

checks whether items in a dataset are linked via design

**Usage**

```
checkLink ( dataFrame, sysmis = NA, verbose = TRUE)
```

**Arguments**

dataFrame	A data.frame where all columns denote test items
sysmis	character string specifying values to be treat as missing by design
verbose	logical: Should output printed to console?

**Value**

A logical value, i.e. TRUE or FALSE, indicating whether items in dataset are linked to each other.

**Author(s)**

Sebastian Weirich

---

collapseMissings*Collapse Missings*

---

**Description**

converts character missings of different types to 0 or NA

**Usage**

```
collapseMissings(dat, missing.rule = NULL, item.names)
```

**Arguments**

dat	data frame containing character missings (e.g. type 'mbd' - missing by design)
missing.rule	list, definition how to recode distinct missings in dataset. See details for default.
item.names	character vector containing column names of the data frames whose character missings are to be collapsed

## Details

Default missing.rule in collapseMissings is: text volume insufficient = 0 , missing not reached = 0 , missing coding impossible = NA , missing by design = NA , missing invalid response = 0 , missing by intention = 0

The results of collapseMissings will be written to a protocol file with sunk.

## Value

A data frame with recoded missings.

## Author(s)

Karoline Sachse, Martin Hecht

## References

For missing types see <http://code.google.com/p/zkdlb/wiki/MissingHandling>

## Examples

```
data(inputDat)
dat1 <- inputDat[[1]] # get first dataset from inputDat
datColMis <- collapseMissings(dat = dat1,
missing.rule = list(mvi = 0 ,mnr = 0 ,mci = 0 ,mbd = NA ,mir = 0 ,mbi = 0),
item.names=colnames(dat1)[- c(1:2)])
```

---

commonItems

*identify common items of groups*

---

## Description

This function identifies items that groups of persons have in common.

## Usage

```
commonItems ( data , group.var , missing = NA , uncommon = FALSE , simplify = TRUE )
```

## Arguments

data	data.frame
group.var	group variable in data.frame , eihter numeric indicator of column or column name
missing	missing specification
uncommon	if TRUE a vector of uncommon items is additionally returned
simplify	if TRUE a character vector is returned (only in case of 2 groups and uncommon=FALSE)



**Value**

returns a list of all group.var combinations with character vectors of common item names if uncommon=TRUE a vector of uncommon (unique) items of each group is additionally returned  
names of list are both group names concatenated by "|"

**Author(s)**

Martin Hecht

**Examples**

```
data(science1)
d <- science1[,c("version",science1.items)]

# common items ar listed for each combination of groups
str ( commonItems ( data = d , group.var = "version" , missing = "mbd" ) )

# uncommon items are returned as well
str ( commonItems ( data = d , group.var = "version" , missing = "mbd" , uncommon = TRUE ) )
```

---

ConQuest.Log.Example1.log

*Example Log File from ConQuest*

---

**Description**

This is a text file with the log from a ConQuest analysis It can be accessed in path file.path( .Library , "eat/extdata/ConQuest.Log.Example1.log" )

**Format**

txt

---

crop	<i>crop</i>
------	-------------

---

**Description**

remove trailing and leading characters from character strings

**Usage**

```
crop ( x , char = " " )
```

**Arguments**

x	character string
char	character to be removed from beginning and end of x

**Author(s)**

Martin Hecht, Sebastian Weirich

---

detect.suppression	<i>detect suppression effects in regression models</i>
--------------------	--

---

## Description

This function detects suppression effects in regression models.

## Usage

```
detect.suppression ( data , dependent , independent , full.return = FALSE , xlsx.path = NULL )
```

## Arguments

data	data.frame with data to be used
dependent	dependent variable in regression model
independent	character vector of independent variables in regression model
full.return	if FALSE a data.frame as a quadratic matrix with suppression effects (TRUE/FALSE) of independent variables is returned if TRUE a data.frame with all calculated terms ist returned
xlsx.path	full path of Excel file that results should be written to

## Details

formulae (13.39a) and (13.39b) decribed in Bortz (1999) page 446 are used  
if full.return=TRUE a data.frame is returned.

Columns are:

rownames: <dependent variable> ~ <independent variables> | <independent variable that is tested for suppression>

multiple.reg: logical, indicates wether there are 2 (FALSE) or more than 2 (TRUE) independent variables in the regression model

dep: dependent variabel in regression model

pred: independent variable that is investigated on suppression effect

preds: independent variables in regression model besides pred

cor\_pred\_c: correlation of pred and dependent variable

cor\_pred\_fitted\_c: correlation of predicted pred by indepenent variables and dependent variable

r.sq\_pred: R squared from model predicting pred by independent variables

rterm.minus: right term in formula (13.39a)

rterm.plus: right termn in formula (13.39b)

rterm.minus.diff: difference of rterm.minus and cor\_pred\_c

rterm.plus.diff: difference of cor\_pred\_c and rterm.plus

(positive difference of rterm.minus.diff or rterm.plus.diff indicates suppression effect)

rterm.minus.log: logical value of formula (13.39a)

rterm.plus.log: logical value of formula (13.39b)

suppression: logical, rterm.minus.log | rterm.plus.log

if `full.return=FALSE` a `data.frame` as quadratic matrix is returned:  
 rows and columns are independent variables  
 diagonal includes suppression for suppression effect of variable in multiple regression  
 triangles include suppression for bivariate independent variables, "row" suppresses "column"

### Value

depends on options `full.return`

### Author(s)

Martin Hecht

### References

for formulae used by `detect.suppression` see  
 Bortz, J. (1999). Statistik fuer Sozialwissenschaftler. 5. Auflage. Berlin: Springer. p. 446

---

dichotomize	<i>dichotomize a numeric vector</i>
-------------	-------------------------------------

---

### Description

dichotomize a numeric vector by median or mean split

### Usage

```
dichotomize ( numvec , method = c("median","mean") , randomize = TRUE , ... )
```

### Arguments

numvec	numeric vector
method	either median or mean split
randomize	logical, if TRUE elements that equal the split threshold are randomly assigned to one of the two groups if FALSE default behavior of cut is used
...	arguments are passed to <a href="#">set.seed</a> and <a href="#">cut</a>

### Value

returns vector with dichotomization indicators

### Author(s)

Martin Hecht

**Examples**

```

numvec <- c(1,2,3,4,5)
dichotomize ( numvec )

# set seed for random assignment of elements that match split threshold by passing argument 'seed' to function
# ( '3' in numvec is on threshold if median is used )
dichotomize ( numvec , seed = 12345 )

# set level names by passing argument 'labels' to cut function
dichotomize ( numvec , labels = c ( "low" , "high" ) )

```

---

exploreDesign	<i>explore data design</i>
---------------	----------------------------

---

**Description**

explore data structure with respect to specific missing code (e.g. "missing by design")

**Usage**

```
exploreDesign ( data , missing = NA , id = NULL , itemsPerPerson = TRUE , personsPerItem = TRUE )
```

**Arguments**

data	data.frame
missing	missing specification
id	id variable in data if exists
itemsPerPerson	logical , if TRUE items per person list is returned
personsPerItem	logical , if TRUE persons per item list is returned

**Value**

depends on itemsPerPerson and personsPerItem , if both are TRUE a list with both elements is returned

**Author(s)**

Martin Hecht

**Examples**

```

data(science1)
d <- science1[,!colnames(science1) %in% science1.context.vars]
design <- exploreDesign ( data = d , missing = "mbd" , id = "id" )
str(design)

```

---

get.dsc	<i>Reads Conquest descriptive files.</i>
---------	--

---

**Description**

Reads Conquest files comprising descriptive population statistics generated by the 'descriptives' statement.

**Usage**

```
get.dsc(file)
```

**Arguments**

file	Character string of the Conquest descriptives file.
------	---

**Value**

A list of n elements, with n the number of groups in the analysis. Each element is a list with two data frames, the single and aggregated descriptives of the corresponding group. Single descriptives give for each dimension the number of observations, mean, standard deviation and variance of the corresponding estimate, i.e. the WLE or the plausible values (PVs). When descriptives for PVs are read in, mean, standard deviation and variance for each plausible value is given. Aggregated descriptives give mean, standard deviation and variance of the standard error of corresponding estimate. When descriptives for plausible values are read in, aggregated descriptives give also mean, standard deviation and variance of all plausible values.

**References**

See Conquest manual, pp.162.

---

get.equ	<i>Reads equivalence table created in Conquest analysis.</i>
---------	--

---

**Description**

Reads Conquest files comprising equivalence tables for MLE or WLE parameters.

**Usage**

```
get.equ(file.equ)
```

**Arguments**

file.equ	Character string of the Conquest equ-file.
----------	--

**Value**

A list of  $n+1$  elements, with  $n$  the number of dimensions in the analysis. Each element is a data.frame, whose name corresponds to the name of the dimension the values belongs to. All data.frames except the last one give the transformation of each possible raw score to the WLE or MLE score including it's standard error. First column in each data.frame contains the raw score, second column the transformed WLE or MLE score, third columns it's standard error.

The last element of the list give some sparse information about the model specifications.

**References**

See Conquest manual, pp.162.

---

get.history	<i>Reads Conquest history files.</i>
-------------	--------------------------------------

---

**Description**

Reads Conquest history file comprising parameter estimates of each iteration.

**Usage**

```
get.history(historyfile, shw.object)
```

**Arguments**

historyfile	Character string of the Conquest history file.
shw.object	Optional: R-Object created by get.shw(). Necessary to label the columns of the history file.

**Value**

A data.frame according to the corresponding Conquest history file. First column comprises the iteration number, second column the deviance of the corresponding iteration. Estimates of model parameters are listed in further columns.

**Author(s)**

Sebastian Weirich

---

get.itn

get.itn

---

### Description

Reads Conquest files comprising item analyses generated by the 'itanal'-statement.

### Usage

```
get.itn(file)
```

### Arguments

file                      Character string of the Conquest item analysis file.

### Value

A data.frame according to the corresponding Conquest item analysis file. Each row represents one response categorie of one item. Columns represents item name (item.name), label (i.e., items' raw score), score (i.e., the 'value' of the corresponding raw score), number of valid responses (n.valid), absolute frequency of the corresponding score (Abs.Freq), relative frequency of the corresponding score (Rel.Freq), items' pvalue (p), the point biserial correlation (pt.bis), T (t.value) and p value (p.value) for significance test of point biserial correlation differ from zero, threshold and delta parameter.

### Author(s)

Sebastian Weirich

---

get.plausible

Reads Conquest plausible values files

---

### Description

Function reads Conquest plausible value files and transforms them into a R data frame.

### Usage

```
get.plausible(file)
```

### Arguments

file                      Character string of the Conquest plausible values file to be read in.

### Details

Funktion identifies number of cases, number of plausible values and number of dimensions.

**Value**

A data frame, where each row corresponds to one case. Columns are labeled with dimension names and number of corresponding plausible value.

case	Case number. Each row represents one person.
ID	Case ID, if listed in Conquest plausible values file.
pv	Plausible value. Denotation of columns names is pv.[name of dimension]_[number of plausible value]. For example, pv.reading_6 refers to the 6th plausible value of reading dimension.
eap	Expectation value of the a posteriori distribution of the corresponding dimension.
eap.se	Standard error of the EAP estimate.

---

get.q3

get.q3

---

**Description**

get Q3 statistics

**Usage**

```
get.q3 ( results )
```

**Arguments**

results                  results (structured list) from automateModels run

**Value**

list (analyses) of data.frames in matrix format containing Q3 statistics

**Author(s)**

Martin Hecht

---

get.shw

*Reads Conquest showfiles*


---

**Description**

Function reads Conquest showfiles and transforms them into a R list of data frames.

**Usage**

```
get.shw(file, dif.term = NULL, split.dif = TRUE,
        abs.dif.bound = 0.64, sig.dif.bound = 0.43)
```



## Arguments

<code>file</code>	Character string of the Conquest showfile to be read in.
<code>dif.term</code>	Optional: Character string. Name of the term considered to be DIF-term. Must match corresponding term in showfile.
<code>split.dif</code>	Logical: When TRUE, DIF-Parameter are only given for Reference group.
<code>abs.dif.bound</code>	When DIF-Parameter are evaluated, this specifies the critical value for absolute DIF.
<code>sig.dif.bound</code>	When DIF-Parameter are evaluated, this specifies the critical value for confidence interval DIF.

## Details

Funktion searches for 'TERM'-statements in Conquest showfile and reads the tables associated with. If one statement is specified to contain DIF analyses, absolute DIF value is computed  $2 \times [\text{group-specific parameter}]$ . Confidence intervals for 90, 95 and 99 percent are computed via the standard error of specific parameters. If both criteria - absolute DIF exceeds `abs.dif.bound` and the confidence interval does not include `sig.dif.bound`, item is considered to have DIF.

## Value

A list of data frames, named by the 'TERM'-statements in Conquest showfile, plus an additional data frame named `regression` with regression coefficients when latent linear regression model was specified in Conquest analysis, plus an additional data frame named `cov.structure` with covariance and correlation matrix of latent dimensions. If uni-dimensional model is specified, the variance of the latent dimension is given instead. If one term was specified as DIF-statement, the corresponding data frame is augmented with additional columns for confidence intervals and indicators specifying significant DIF.

Each data frame corresponding to a 'TERM' statement contains following columns:

<code>item</code>	Name of item
<code>ESTIMATE</code>	Estimated difficulty of item
<code>ERROR</code>	Standard error of estimated item difficulty
<code>MNSQ</code>	Item's 'Outfit'
<code>MNSQ.1</code>	Items's 'Infit'
<code>CI</code>	Lower and upper bound confidence intervals
<code>T</code>	T values, corresponding to confidence intervals
<code>filename</code>	Name of show file read in
<code>abs.dif</code>	Only for DIF analysis. Absolute DIF, computed as $2 \times [\text{group-specific parameter}]$ .
<code>ci.lb</code>	Lower bound confidence interval for specific significance level of 90, 95 or 99 percent.
<code>ci.ub</code>	Upper bound confidence interval for specific significance level of 90, 95 or 99 percent.
<code>sig</code>	Indicates whether the corresponding item matches both DIF criteria. See details.

When latent regression was specified, the last element of the returned list is a data frame with regression coefficients, corresponding to the number of dimensions and the number of regressors. Regressor names, regression coefficients and its standard errors are given for each dimension.

Rows represent the regressors, columns represent the latent dimension to which the regression is fitted.

---

get.wle	<i>Reads Conquest WLE or MLE files.</i>
---------	---

---

**Description**

Reads Conquest files comprising maximum likelihood estimates (MLE) or weighted likelihood estimates (WLE).

**Usage**

```
get.wle(file)
```

**Arguments**

file	Character string of the Conquest MLE or WLE file to be read in.
------	---

**Value**

A data frame with columns according to the corresponding MLE or WLE file. For each dimension of the analysis number of solved items, number of presented items, point estimate and its standard error is given. Each row represents one person. Columns are named as follows:

case	Case number. Each row represents one person.
n.solved	Number of solved items by the i-th person.
n.total	Number of total items presented to the i-th person.
wle	WLE or MLE estimate.
wle.se	Standard error of WLE or MLE estimate.

The last number of columns names represents the dimension the WLE or MLE estimate belongs to.

---

getConquestVersion	<i>get version (build) of ConQuest</i>
--------------------	--

---

**Description**

get version (build) of ConQuest

**Usage**

```
getConquestVersion ( path.conquest , asDate = TRUE )
```

**Arguments**

path.conquest	full path to ConQuest executable console
asDate	if TRUE an object of class 'date' is returned if FALSE a character string is returned

**Value**

depends on option 'asDate'

**Author(s)**

Martin Hecht

**Examples**

```
getConquestVersion ( "c:/ConQuest/console_Feb2007.exe" )
```

inputDat

*List of Three Datasets from Educational Assessment***Description**

Simulated data for three booklets for an educational assessment study.

**Usage**

```
data(inputDat)
```

**Format**

This list contains 3 data frames, each with the following columns:

**ID** Person-ID

**Hisei** A continuous covariate.

**Ixx** Item responses to a selection of 30 test items.

**Details**

code, subunit and unit descriptions are stored in dataset [inputList](#).

**Examples**

```
data(inputDat)
str(inputDat)
```

inputList

*Data Frames with Code, Subunit and Unit Information for Datasets in [inputDat](#)***Description**

These data frames contain information about codes, subunits and units for the datasets in [inputDat](#) and are necessary inputs for functions [automateDataPreparation](#), [checkData](#), [recodeData](#) and [aggregateData](#).

**Usage**

```
data(inputList)
```

## Format

A list with three data frames:

1. **units**: Unit information, contains the following columns:
  - unit** Unit name.
  - unitType** Subunit types: ID = ID variable; TI = test item; CV = context variable.
  - unitLabel** Unit label, to be used by [writeSpss](#).
  - unitDescription** Unit description.
  - unitAggregateRule** Aggregate rule for unit: SUM; MEAN.
  - unitScoreRule** Scoring rule for unit (not sure how this will be used in the future.)
2. **subunits**: Subunit information, contains the following columns:
  - unit** Unit name, for which subunits are given.
  - subunit** Subunit name.
  - subunitType** Subunit types: ' ? '.
  - subunitLabel** Subunit label, to be used by [writeSpss](#).
  - subunitDescription** Subunit descriptions.
  - subunitPosition** Subunit position in test booklet (e.g., line 1).
  - subunitTransniveau** Subunit transformation level.
  - subunitRecoded** Name of recoded subunit.
  - subunitLabelRecoded** Label for recoded subunit, to be used when [writeSpss](#) is applied to a dataset produced by [recodeData](#).
3. **values**: Value information, contains the following columns:
  - subunit** Subunit name, for which values are given.
  - value** Valid values for the respective subunit.
  - valueRecode** Recode values for the respective value.
  - valueType** Value types: vc = valid code; mbd = missing – by design; mvi = missing – volume insufficient; mnrr = missing – not reached; mci = missing – coding impossible; mbi = missing – by intention.
  - valueLabel** Value labels, to be used by [writeSpss](#).
  - valueDescription** Value descriptions.
  - valueLabelRecoded** Labels for recoded values, to be used when [writeSpss](#) is applied to a dataset produced by [recodeData](#).
  - valueDescriptionRecoded** Descriptions for recoded values.
4. **unitRecodings**: Unit recoding information, contains the following columns:
  - unit** Unit name
  - value** Valid values for the respective unit.
  - valueRecode** Recode values for the respective value.
  - valueType** Value types: vc = valid code; mbd = missing – by design; mvi = missing – volume insufficient; mnrr = missing – not reached; mci = missing – coding impossible; mbi = missing – by intention.
  - valueLabel** Value labels, to be used by [writeSpss](#).
  - valueDescription** Value descriptions.
  - valueLabelRecoded** Labels for recoded values, to be used when [writeSpss](#) is applied to a dataset produced by [recodeData](#).
5. **savFiles**: information for [loadSav](#), contains the following columns:

**filename** SPSS filenames

**case.id** ID variable in the respective dataset, used by [mergeData](#)

6. newID: information for [mergeData](#), contains the following columns:

**key** one of the entries should be master-id

**value** the corresponding value; how the ID variable in the final dataset shall be named

7. aggrMiss: missing aggregation pattern for [aggregateData](#)

## Examples

```
data(inputList)
str(inputList)
```

---

loadSav	<i>loadSav</i>
---------	----------------

---

## Description

read SPSS data files and change id names, if necessary

## Usage

```
loadSav(path = getwd(), savFiles = NULL, oldIDS, newID, correctDigits = FALSE, truncateSpaceChar
```

## Arguments

```
path
savFiles
oldIDS
newID
correctDigits
truncateSpaceChar
```

## Examples

```
##---- Should be DIRECTLY executable !! ----
##-- ==> Define data, use random,
##--or do help(data=index) for the standard data sets.

## The function is currently defined as
function ( path=getwd(), savFiles=NULL, oldIDS, newID, correctDigits=FALSE, truncateSpaceChar = TRUE ) {
  funVersion <- "loadSAV_0.0.2"
  if(missing(oldIDS)) {stop(paste("Error in ",funVersion,": 'oldIDS' is missing.\n",sep="")) }
  if(missing(newID)) {stop(paste("Error in ",funVersion,": 'newID' is missing.\n",sep="")) }
  if(length(newID)!=1) {stop(paste("Error in ",funVersion,": 'newID' has to be of length 1.\n",sep="")) }
  # if(!exists("read.spss")) {library(foreign)}
  if(!is.null(savFiles)) {
    fileExists <- file.exists(file.path(path,savFiles))
    if(all(!fileExists)) {
      stop(paste("Error in ",funVersion,": None of the files specified in 'savFiles' were found
```

```

    }
    if(!all(fileExists)) {
      cat(paste(funVersion,": Following files specified in 'savFiles' were not found in ",path,
      notFoundFiles <- savFiles[!fileExists]
      FoundFiles <- savFiles[fileExists]
      cat(paste(notFoundFiles,collapse=" ", ""))
      cat("\nOnly found files will be read in.\n")
      savFiles <- savFiles[fileExists]
    }
  }
  if(is.null(savFiles)) {
    savFiles <- list.files(path=path,pattern=".sav|.SAV",recursive=FALSE)
    if(length(savFiles)==0) {
      stop(paste("No '.sav'-files found in ",path,".\n",sep=""))
    }
  }
  cat(paste(funVersion,": Found ", length(savFiles), " 'savFiles' in ",path,".\n",sep=""))
}
### hier beginnt das eigentliche Einlesen
allDataFrames <- NULL
for (i in seq(along=savFiles)) {
  file.i <- data.frame(read.spss(file.path(path,savFiles[i]),to.data.frame=FALSE, use.value.1
  idCol <- unique(unlist(lapply(oldIDS, FUN=function(ii) {grep(ii,colnames(file.i))})))
  if(length(idCol)<1) {
    stop(paste("Error in ",funVersion,": None of the specified 'oldIDS' were found in dataset
  }
  if(length(idCol)>1) {
    stop(paste("Error in ",funVersion,": More than one of the specified 'oldIDS' were found
  }
  colnames(file.i)[idCol] <- newID
  ### Leerzeichen abschnipseln
  if(truncateSpaceChar == TRUE) {
    for (ii in 1:ncol(file.i)) {
      file.i[,ii] <- crop(file.i[,ii])
    }
  }
  ### Stelligkeitskorrektur
  if(correctDigits == TRUE) {
    colsToCorrect <- lapply(1:ncol(file.i), FUN=function(ii) { sort(unique(nchar(file.i[,ii]
    options(warn = -1)
    colsToCorrect <- which( unlist( lapply(colsToCorrect, FUN=function(ii) { all(ii == c(1
    options(warn = 0)
    if(length(colsToCorrect)>0) {
      cat(paste(funVersion,": ",length(colsToCorrect)," columns are corrected for column w
      for (ii in colsToCorrect) {
        file.i[,ii] <- gsub(" ", "0", formatC(as.character(file.i[,ii]),width=2))
      }
    }
  }
  allDataFrames[[i]] <- file.i
}
return(allDataFrames)
}

```

**Description**

transforms long format data.frame into a matrix format data.frame

**Usage**

```
long2matrix ( data , sort = TRUE , triangle = NULL ,
force.diagonal = FALSE , exclude.diagonal = FALSE ,
long2matrix = TRUE )
```

**Arguments**

data	data.frame with columns "row" , "col" , "val"
sort	sort rows and columns of matrix
triangle	if not NULL a symmetric matrix will be constructed available options are "upper" , "lower" , "both"
force.diagonal	a diagonal is forced into matrix even if no diagonal elements are in data
exclude.diagonal	the diagonal is excluded if possible
long2matrix	if FALSE data is not transformed

**Value**

```
long2matrix = TRUE
      data.frame in matrix format
long2matrix = FALSE
      data.frame in long format
```

**Author(s)**

Martin Hecht

**Examples**

```
d1 <- data.frame (
"row" = c ( "v1" , "v2" , "v2" , "v3" , "v1" , "v3" ) ,
"col" = c ( "v1" , "v3" , "v2" , "v1" , "v2" , "v3" ) ,
"val" = c ( 1 , 5 , 4 , 3 , 2 , 6 ) , stringsAsFactors = FALSE )

# unsorted matrix
long2matrix ( data = d1 , sort = FALSE )
# sorted by default
long2matrix ( data = d1 )
# extract upper triangle of symmetric matrix
long2matrix ( data = d1 , triangle = "upper" )
# exclude diagonal elements
long2matrix ( data = d1 , triangle = "upper" , exclude.diagonal = TRUE )
# if full matrix ("both" triangles) is requested, the diagonal cannot be excluded, option is ignored
long2matrix ( data = d1 , triangle = "both" , exclude.diagonal = TRUE )

# no diagonal elements are specified
d2 <- data.frame (
"row" = c ( "v2" , "v1" , "v1" ) ,
"col" = c ( "v3" , "v3" , "v2" ) ,
"val" = c ( 5 , 3 , 2 ) , stringsAsFactors = FALSE )
```

```
long2matrix ( data = d2 )
# diagonal is set (with NAs)
long2matrix ( data = d2 , triangle = "upper" , force.diagonal = TRUE )
```

---

makeCodebookInput	<i>Make Input Data Frames From IQB-Codebooks</i>
-------------------	--

---

### Description

Make Input Data Frames From IQB-Codebooks

### Usage

```
makeCodebookInput(codebook)
```

### Arguments

codebook	dataframe IQB-Codebook
----------	------------------------

### Details

xxx

### Value

xxx

---

makeInputLists	<i>Generate Input Lists for Functions checkData, recodeData and aggregateData</i>
----------------	---

---

### Description

Transforms information given in values, subunits and units in a format that is used by checkData, recodeData and aggregateData.

### Usage

```
makeInputLists(values, subunits, units, recodedData = TRUE)
makeInputCheckData(values, subunits, units)
makeInputRecodeData(values, subunits)
makeInputAggregateData(subunits, units, recodedData = TRUE)
```

### Arguments

values	A data frame with code information. See Details.
subunits	A data frame with subunit information. See Details.
units	A data frame with unit information. See Details.
recodedData	Logical indicating whether colnames in dataset to aggregate are the subunit names (as in subunits\$subunit) or recoded subunit names (as in subunits\$subunitRecoded). Default is TRUE, meaning that colnames are recoded subitem names. This parameter is only relevant when input for aggregateData is generated.



**Details**

This function generates specific inputs for the data preparation functions `checkData`, `recodeData` and `aggregateData`. It is largely for internal use of these functions, who call their respective version.

Examples of data frames values, subunits and units can be found via `data(inputLists)`.

**Value**

A list with several of the following entries (depending on which version of the function is called):

<code>varinfoRaw</code>	A list with information about variables and their values expected in raw data.
<code>varinfoRecoded</code>	A list with information about variables and their values expected in recoded data.
<code>varinfoAggregated</code>	A list with information about variables and their values expected in aggregated data.
<code>recodeinfo</code>	A list with information needed for recoding of data.
<code>aggregateinfo</code>	A list with information needed for aggregation of data.

**Author(s)**

Nicole Haag

**Examples**

```
data(inputList)
lists <- makeInputLists(inputList$values, inputList$subunits, inputList$units, recodedData = TRUE)
str(lists)
```

---

makeNumeric

*Change Character Variables to numeric*


---

**Description**

Converts character variables, which contain only values, to `numeric`. Character variables containing letters are not converted. This avoids warnings, if conversion to `numeric` is attempted for variables, which contain characters.

**Usage**

```
makeNumeric(variable)
```

**Arguments**

<code>variable</code>	Variable to be changed to <code>numeric</code> .
-----------------------	--

**Value**

Variable converted to `numeric`, if possible.

**Author(s)**

Nicole Haag

**Examples**

```
a <- c("1", "2", "3", "4")
b <- c("1", "2", "x", "4")
makeNumeric(a)
makeNumeric(b)
```

mergeData

*Merge Data Frames using one Key Variable***Description**

Merges several data frames and matches them using one key variable

**Usage**

```
mergeData(newID = "ID", datList, oldIDs=NULL, addMbd = FALSE, writeLog=FALSE)
```

**Arguments**

newID	character string containing the key variable's name in the merged dataset
datList	list of data frames to be merged
oldIDs	character vector OR numeric vector containing either names of the key variables in datList or their column number in each dataframe in datList default is a vector containing replicates of the value of newID.
addMbd	logical; string "mbd" (missing by desgin) will be added instead of NA
writeLog	logical; if Logfile shall be written via <a href="#">sunk</a> .

**Value**

A data frame containing unique cases and unique variables. All cases and all variables that could be identified the original data frames will be kept and matched.

**Author(s)**

Karoline Sachse, Nicole Haag

**Examples**

```
data(inputDat)
str(inputDat)

mergedDataset <- mergeData("person-id", inputDat, c("idstud", "idstud", "idstud"), addMbd=TRUE)
str(mergedDataset)

mergedDataset <- mergeData("idstud", inputDat, writeLog=FALSE)
str(mergedDataset)
```

---

prepare.package	<i>prepare.package</i>
-----------------	------------------------

---

**Description**

prepares package

**Usage**

```
prepare.package ( source.folder = "p:/ZKD/development" ,  
  files ,  
  package.folder = "p:/ZKD/packages" ,  
  package.name ,  
  package.version )
```

**Arguments**

source.folder	folder of R files
files	character vector of R files that should be included in the package
package.folder	folder of packages
package.name	name of package
package.version	version of package, must be in format "0.0.0"

**Details**

copies R files from source.folder to package folder copies "x.x.x" folder content to package folder modifies version and date in DESCRIPTION and automateModels creates ChangeLog

**Author(s)**

Martin Hecht

---

readDaemonXlsx	<i>read xlsx-Files produced by ZKDaemon</i>
----------------	---

---

**Description**

read xlsx-Files produced by ZKDaemon

**Usage**

```
readDaemonXlsx(filename)
```

**Arguments**

filename	A character string containing path, name and extension of .xlsx produced by ZKDaemon. Caution! Sheet order is important (see Details).
----------	--

**Details**

Compulsory: 1st sheet: units. 2nd sheet: subunits. 3rd sheet: values. Optional: 4th sheet: unitRecodings. 5th sheet: savFiles. 6th sheet: newID. 7th sheet: aggregateMissings. 8th sheet: unitProperties. 9th sheet: property labels. 10th sheet: booklets.

**Value**

A list of data frames containing information that is required by [automateDataPreparation](#)

**Author(s)**

Karoline Sachse

**Examples**

```
str(inputList)
```

---

recodeData	<i>Recode Datasets with Missing Values</i>
------------	--

---

**Description**

Recode datasets with special consideration of missing values.

**Usage**

```
recodeData(dat, values, subunits)
```

**Arguments**

dat	A data frame
values	A data frame with code information. See 'Details'.
subunits	A data frame with subunit information. See 'Details'.

**Details**

recodeData recodes data frames with special consideration of missing values. The results of recodeData will be written to a protocol file with sunk. recodeData will give warnings, if missing or incomplete recode informations are found. Values without recode information will NOT be recoded!

Examples of data frames values and subunits can be found via `data(inputList)`

**Value**

A data frame with recoded variables according to the specifications in values and subunits. Column names will be the names specified in `subunits$subunitRecoded`.

**Author(s)**

Martin Hecht, Christiane Penk, Nicole Haag

## References

<http://code.google.com/p/zkdlb/wiki/MissingHandling>

## See Also

[aggregateData](#), [checkData](#)

## Examples

```
data(inputDat)
data(inputList)
# library(car)

dat1 <- inputDat[[1]] # get first dataset from inputDat
datRec <- recodeData(dat1, inputList$values, inputList$subunits)
str(datRec)
```

---

reinsort.col

*reinsort.col*

---

## Description

insert columns of dataframe in specific position

## Usage

```
reinsort.col ( dat , toreinsort , after )
```

## Arguments

dat	data.frame on which operation should be performed
toreinsort	column name(s) or numeric indicator(s) that should be relocated
after	column name or numeric indicator after that toreinsort should be located

## Value

data.frame

## Author(s)

Martin Hecht





---

rmNArows	<i>remove NA rows from data</i>
----------	---------------------------------

---

## Description

remove rows that are completely or partially NA from data.frame or matrix

## Usage

```
rmNArows ( data , cols = NULL , tolerance = 0 , cumulate = TRUE , remove = TRUE , verbose = FALSE )
```

## Arguments

data	data.frame or matrix
cols	columns to include, can be a list of vectors to specify column subsets
tolerance	number of non-NA cells that are "tolerated", can be a list corresponding to cols
cumulate	if TRUE, tolerance is cumulated; if FALSE, exact tolerance is used
remove	if TRUE, columns and rows are removed; if FALSE, identified rows are returned
verbose	if TRUE removed columns and rows are printed on output window

## Value

depends on option remove

## Author(s)

Martin Hecht

## See Also

calls [rmNA](#) and [rmNAcols](#)

## Examples

```
# example matrix
( mat <- matrix( c( 1,1,1,1,1, 1,1,1,1,NA, 1,1,1,NA,NA, 1,1,NA,NA,NA, 1,NA,NA,NA,NA, NA,NA,NA,NA,NA ) , ncol=15 ) )

# remove row with entirely NA (row 6)
rmNArows( mat , verbose = TRUE )

# remove row with NA on column 3, 4, 5 (rows 4, 5, 6)
rmNArows( mat , c(3,4,5) , verbose = TRUE )
rmNArows( mat , c(-1,-2) , verbose = TRUE )

# tolerance=1 , 1 non-NA is permitted (rows 5 and 6)
rmNArows( mat , tolerance=1 , verbose = TRUE )

# tolerance=5 , 5 non-NA are permitted (all rows are removed)
rmNArows( mat , tolerance=5 , verbose = TRUE )

# do not cumulate / exact tolerance (row 1 is removed)
rmNArows( mat , tolerance=5 , cumulate=FALSE , verbose = TRUE )
```



```
rmNArows( mat , tolerance=5 , cumulate=FALSE , remove = FALSE )

# two subsets of columns
rmNArows( mat , cols = list( c(1, 2), c(4, 5) ) , verbose = TRUE )

# two subsets of columns with different tolerance
rmNArows( mat , cols = list( c(1), c(2, 3, 4, 5) ) , tolerance = list( 0 , 1 ) , verbose = TRUE )

# identify rows, no deletion
rmNArows( mat , cols = list( c(1), c(2, 3, 4, 5) ) , tolerance = list( 0 , 1 ) , remove = FALSE )
```

---

science1

*Science achievement test data*


---

### Description

This data set contains responses of 420 students on 185 science items. Additional variables are included: id, grade, sex, booklet, track, version, and four dummy coded variables that indicate Track x Version groups. An incomplete block design was used with 4 booklets. Codes on items are: "0" - wrong "1" - right "mbd" - missing by design "mbi" - missing by intention "mir" - missing due to irregular response

### Usage

```
data(science1)
```

### Format

'data.frame': 420 obs. of 195 variables

### Source

Simulated data

---

science1.context.vars *Science achievement test data - Context variable names*


---

### Description

This vector contains the names of context variables in data set [science1](#)

### Format

chr [1:9]

---

science1.items	<i>Science achievement test data - Item names</i>
----------------	---

---

**Description**

This vector contains the names items in data set [science1](#)

**Format**

chr [1:185]

---

science1.scales	<i>Science achievement test data - Scale definition</i>
-----------------	---

---

**Description**

This data frame contains scale definitions for usage with [automateModels](#) and data set [science1](#)

**Format**

'data.frame': 185 obs. of 7 variables

---

set.col.type	<i>set type of variable in data.frame</i>
--------------	---

---

**Description**

converts type of column(s) to "character" , "numeric" , "logical" , "integer" or "factor"

**Usage**

```
set.col.type ( data , col.type = list ( "character" = NULL ) , verbose = FALSE , ... )
```

**Arguments**

data	data.frame
col.type	named list of variable names that are to be converted. names of list is conversion type ( "character" , "numeric" , "numeric.if.possible" , "logical" , "integer" or "factor" )
verbose	if TRUE variables that have been converted are printed
...	arguments to be passed to <a href="#">asNumericIfPossible</a>

**Details**

use col.type="numeric.if.possible" if conversion to numeric should be tested upfront, see [asNumericIfPossible](#) for details

**Author(s)**

Martin Hecht

**Examples**

```

str ( d <- data.frame ( "var1" = 1 , "var2" = TRUE , "var3" = FALSE , "var4" = as.factor ( 1 ) , "var5" = a
str ( set.col.type ( d ) )
str ( set.col.type ( d , list ( "numeric" = NULL ) ) )
str ( set.col.type ( d , list ( "character" = c ( "var1" , "var2" ) , "numeric" = "var3" , "logical" = "var
str ( set.col.type ( d , list ( "numeric.if.possible" = NULL ) ) )
str ( set.col.type ( d , list ( "numeric.if.possible" = NULL ) , transform.factors = TRUE ) )
str ( set.col.type ( d , list ( "numeric.if.possible" = NULL ) , transform.factors = TRUE , maintain.factors

```

sortDfrByNames

*sort data.frame by colnames and/or rownames***Description**

specify new colnames and/or rownames order, data.frame is sorted in accordance

**Usage**

```
sortDfrByNames ( dfr , col.order = NULL , row.order = NULL , warn = TRUE )
```

**Arguments**

dfr	data.frame
col.order	character vector of colnames in new order
row.order	character vector of rownames in new order
warn	logical, if TRUE warnings are printed on output window if col.order/row.order do not correspond to colnames/rownames resp.

**Value**

data.frame

**Author(s)**

Martin Hecht

**Examples**

```

dfr <- data.frame ( matrix ( rnorm ( 100 ) , ncol = 10 ) )
colnames ( dfr ) <- paste ( "X" , 10:1 , sep = "" )
rownames ( dfr ) <- paste ( "X" , 11:2 , sep = "" )
dfr

# sort data.frame by 'col.order' and 'row.order'
sortDfrByNames ( dfr , paste ( "X" , 1:10 , sep = "" ) , paste ( "X" , 2:11 , sep = "" ) )

```

---

source.it.all	<i>source.it.all</i>
---------------	----------------------

---

**Description**

sources \*.R files of folder

**Usage**

```
source.it.all ( folder="p:/ZKD/development" , develop.modules = NULL , return.stable = FALSE )
```

**Arguments**

folder	folder with *.R files
develop.modules	character vector of R files that should be sourced in development status
return.stable	if TRUE nothing is sourced and a vector of all stable versions is returned

**Value**

return.stable = FALSE	sources R files
return.stable = TRUE	character vector of stable R files

**Author(s)**

Christiane Penk, Martin Hecht

---

source.it.all2	<i>source.it.all2</i>
----------------	-----------------------

---

**Description**

sources \*.R files of folder

**Usage**

```
source.it.all2 ( folder="p:/ZKD/development" , use.zkd.conv = TRUE , development = TRUE , develo
```

**Arguments**

folder	folder with *.R files
development	if TRUE development versions are sourced (if non-existent the latest stable is sourced or nothing is sourced, see option development.only\ if FALSE stable versions are sourced
use.zkd.conv	if TRUE R files in folder are checked to be consistent with specific ("zkd") versioning convention \ if FALSE all R files in folder are sourced
development.only	if TRUE only development versions are sourced \ if FALSE stable versions are included
exclude	character vector of R files that should not be sourced

**Value**

sources R files

**Author(s)**

Martin Hecht, Christiane Penk

---

sunk	<i>sunk</i>
------	-------------

---

**Description**

writes output to file

**Usage**

```
sunk ( cmd = NULL , path = NULL , write = TRUE , console.output = TRUE , new.file = FALSE , text
```

**Arguments**

cmd	character string of element to write, may be either text (e.g. "write me to file") or a function call (e.g. "summary(lm)")
path	path (folder and name) to output file if NULL path is defaulted to getwd()+"sunk.txt" all environments are searched for sunk.path, if sunk.path is found (exists), it is used
write	logical, if TRUE (default) output is written to file
console.output	logical, if TRUE (default) output is displayed on console
new.file	logical, if TRUE the output file is created if FALSE (default) output is appended to existing file
text.on.error	logical, sunk checks if the character string 'cmd' is an evaluable expression if TRUE (default), 'cmd' is treated as text if an error occurs when trying to evaluate string if FALSE, sunk stops on errors/not evaluable expressions
text.out.method	choose "cat" (default) or "print" as the output method for text

**Value**

writes to disk

**Author(s)**

Martin Hecht

writeSpss

*Export Datasets to SPSS***Description**

Writes data and SPSS syntax files.

**Usage**

```
writeSpss(dat, values, subunits, units,
  filedat = "zkddata.txt", filesps = "readZkdData.sps",
  missing.rule = list(mvi = 0, mnr = 0, mci = NA, mbd = NA, mir = 0, mbi = 0),
  path = getwd(), sep = "\t", dec = ",", silent = FALSE)
```

**Arguments**

<code>dat</code>	A data frame
<code>values</code>	A data frame with code information. See 'Details'.
<code>subunits</code>	A data frame with subunit information. See 'Details'.
<code>units</code>	A data frame with unit information. See 'Details'.
<code>filedat</code>	A character string with the name of the output data file.
<code>filesps</code>	A character string with the name of the output syntax file.
<code>missing.rule</code>	A list containing recode information for character missings. See 'References' for description of default values.
<code>path</code>	A character string containing the path of the output file. The value in <code>path</code> is appended to <code>filedat</code> and <code>filesps</code> . By default, files are written to the current R working directory. If <code>path=NULL</code> then no file path appending is done.
<code>sep</code>	The separator between the data fields.
<code>dec</code>	The decimal separator for numerical data.
<code>silent</code>	A logical flag stating whether the names of the files should be printed.

**Details**

This function automates most of the work needed to export a dataset to SPSS. It uses a modified version of `writeForeignSPSS()` from the `foreign()` package and of `mids2spss()` from the `mice` package. The modified version allows for a choice of the field and decimal separators, makes some improvements to the formatting and provides variable labels and value labels according to the information in the data frames `values`, `subunits` and `units`.

Examples of data frames `values`, `subunits` and `units` can be found on `data(inputList)`

The SPSS syntax file has the proper file names and separators set, so in principle it should run and read the data without alteration. SPSS is more strict than R with respect to the paths. Always use the full path, otherwise SPSS may not be able to find the data file.

**Value**

Used for its side effects. The return value is `NULL`.

**Author(s)**

Nicole Haag

**References**

<http://code.google.com/p/zkdlb/wiki/MissingHandling>

---

<i>yen.q3</i>	<i>yen.q3</i>
---------------	---------------

---

**Description**

Q3 statistics

**Usage**

```
yen.q3 ( dat , theta , b , progress = T )
```

**Arguments**

<code>dat</code>	<code>bla</code>
<code>theta</code>	<code>bla</code>
<code>b</code>	<code>bla</code>
<code>progress</code>	<code>bla</code>

# Index

## \*Topic \textasciitildekw1

- asNumericIfPossible, 4
- automateConquestModel, 5
- automateDataPreparation, 8
- automateModels, 10
- bi.linking, 12
- checkData, 13
- checkInput, 14
- checkLink, 15
- collapseMissings, 15
- commonItems, 16
- crop, 17
- detect.suppression, 18
- dichotomize, 19
- exploreDesign, 20
- get.dsc, 21
- get.equ, 21
- get.history, 22
- get.itn, 23
- get.plausible, 23
- get.q3, 24
- get.shw, 24
- get.wle, 26
- getConquestVersion, 26
- loadSav, 29
- long2matrix, 30
- makeCodebookInput, 32
- makeNumeric, 33
- mergeData, 34
- prepare.package, 35
- recodeData, 36
- reinsort.col, 37
- rmNA, 38
- rmNAcols, 38
- rmNArows, 40
- set.col.type, 42
- sortDfrByNames, 43
- source.it.all, 44
- source.it.all2, 44
- sunk, 45
- yen.q3, 47

## \*Topic \textasciitildekw2

- asNumericIfPossible, 4

- automateConquestModel, 5
- automateDataPreparation, 8
- automateModels, 10
- bi.linking, 12
- checkData, 13
- checkInput, 14
- checkLink, 15
- collapseMissings, 15
- commonItems, 16
- crop, 17
- detect.suppression, 18
- dichotomize, 19
- exploreDesign, 20
- get.dsc, 21
- get.equ, 21
- get.history, 22
- get.itn, 23
- get.plausible, 23
- get.q3, 24
- get.shw, 24
- get.wle, 26
- getConquestVersion, 26
- loadSav, 29
- long2matrix, 30
- makeCodebookInput, 32
- makeNumeric, 33
- mergeData, 34
- prepare.package, 35
- recodeData, 36
- reinsort.col, 37
- rmNA, 38
- rmNAcols, 38
- rmNArows, 40
- set.col.type, 42
- sortDfrByNames, 43
- source.it.all, 44
- source.it.all2, 44
- sunk, 45
- yen.q3, 47

## \*Topic datasets

- inputDat, 27
- inputList, 27
- science1, 41



science1.scales, [42](#)  
 \*Topic **package**  
   eat-package, [2](#)  
  
 aggregateData, [3](#), [9](#), [29](#), [37](#)  
 asNumericIfPossible, [4](#), [42](#)  
 automateConquestModel, [5](#), [12](#)  
 automateDataPreparation, [8](#), [27](#), [36](#)  
 automateModels, [8](#), [10](#), [42](#)  
  
 bi.linking, [12](#)  
  
 checkData, [4](#), [9](#), [13](#), [27](#), [37](#)  
 checkInput, [14](#)  
 checkLink, [8](#), [11](#), [15](#)  
 collapseMissings, [15](#)  
 commonItems, [16](#)  
 ConQuest.Log.Example1.log, [17](#)  
 crop, [17](#)  
 cut, [19](#)  
  
 detect.suppression, [18](#)  
 dichotomize, [19](#)  
  
 eat-package, [2](#)  
 exploreDesign, [20](#)  
  
 get.dsc, [21](#)  
 get.equ, [21](#)  
 get.history, [22](#)  
 get.itn, [23](#)  
 get.plausible, [23](#)  
 get.q3, [24](#)  
 get.shw, [24](#)  
 get.wle, [26](#)  
 getConquestVersion, [26](#)  
  
 inputDat, [27](#), [27](#)  
 inputList, [27](#), [27](#)  
  
 loadSav, [8](#), [9](#), [28](#), [29](#)  
 long2matrix, [30](#)  
  
 makeCodebookInput, [32](#)  
 makeInputAggregateData  
   (makeInputLists), [32](#)  
 makeInputCheckData (makeInputLists), [32](#)  
 makeInputLists, [9](#), [15](#), [32](#)  
 makeInputRecodeData (makeInputLists), [32](#)  
 makeNumeric, [33](#)  
 mergeData, [9](#), [29](#), [34](#)  
  
 prepare.package, [35](#)  
  
 readDaemonXlsx, [9](#), [35](#)  
  
 recodeData, [4](#), [9](#), [27](#), [28](#), [36](#)  
 reinsort.col, [37](#)  
 rmNA, [38](#), [39](#), [40](#)  
 rmNACols, [38](#), [38](#), [40](#)  
 rmNArows, [38](#), [39](#), [40](#)  
  
 science1, [41](#), [41](#), [42](#)  
 science1.context.vars, [41](#)  
 science1.items, [42](#)  
 science1.scales, [42](#)  
 set.col.type, [42](#)  
 set.seed, [19](#)  
 sortDfrByNames, [43](#)  
 source.it.all, [44](#)  
 source.it.all2, [44](#)  
 sunk, [14](#), [34](#), [45](#)  
  
 writeSpss, [8](#), [9](#), [28](#), [46](#)  
  
 yen.q3, [47](#)