Package 'psychReport'

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Description
Helper functions for producing reports in Psychology (Reproducible Research). Provides required formatted strings (APA style) for use in 'Knitr'/'Latex' integration within *.Rnw files.

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R topics documented:

`psychReport-package` *psychReport*

Description

Helper functions for producing reports in Psychology (Reproducible Research). Provides required formatted strings (APA style) for use in 'Knitr'/'Latex' integration within *.Rnw files.

`addDataDF` *addDataDF*

Description

Add simulated ex-gaussian reaction-time (RT) data and binary error (Error = 1, Correct = 0) data to an R DataFrame. This function can be used to create simulated data sets.

Usage

```
addDataDF(dat, RT = NULL, Error = NULL)
```

Arguments

`dat`	DataFrame (see createDF)
`RT`	RT parameters (see rtDist)
`Error`	Error parameters (see errDist)

Value

DataFrame with RT (ms) and Error (bool) columns

Examples

```
# Example 1: default dataframe
dat <- createDF()
dat <- addDataDF(dat)
hist(dat$RT, 100)
table(dat$Error)

# Example 2: defined overall RT parameters
dat <- createDF(nVP = 50, nTrl = 50, design = list("Comp" = c("comp", "incomp")))
dat <- addDataDF(dat, RT = c(500, 150, 100))
boxplot(dat$RT ~ dat$Comp)
table(dat$Comp, dat$Error)

# Example 3: defined RT + Error parameters across conditions
dat <- createDF(nVP = 50, nTrl = 50, design = list("Comp" = c("comp", "incomp")))
dat <- addDataDF(dat,
                 RT = list("Comp_comp"   = c(500, 80, 100),
                           "Comp_incomp" = c(550, 80, 140)),
                 Error = list("Comp_comp"   = 5,
                              "Comp_incomp" = 10))
boxplot(dat$RT ~ dat$Comp)
table(dat$Comp, dat$Error)

# Example 4:
# create dataframe with defined RT + Error parameters across different conditions
dat <- createDF(nVP = 50, nTrl = 50, design = list("Comp" = c("comp", "incomp", "neutral")))
dat <- addDataDF(dat,
                 RT = list("Comp_comp"      = c(500, 150, 100),
                           "Comp_neutral"   = c(550, 150, 100),
                           "Comp_incomp"    = c(600, 150, 100)),
                 Error = list("Comp_comp"    =  5,
                              "Comp_neutral" = 10,
                              "Comp_incomp"  = 15))
boxplot(dat$RT ~ dat$Comp)
table(dat$Comp, dat$Error)

# Example 5:
# create dataframe with defined RT + Error parameters across different conditions
dat <- createDF(nVP = 50, nTrl = 50,
                design = list("Hand" = c("left", "right"),
                              "Side" = c("left", "right")))
dat <- addDataDF(dat,
                 RT = list("Hand:Side_left:left"   = c(400, 150, 100),
                           "Hand:Side_left:right"  = c(500, 150, 100),
                           "Hand:Side_right:left"  = c(500, 150, 100),
                           "Hand:Side_right:right" = c(400, 150, 100)),
                 Error = list("Hand:Side_left:left"   = c(5,4,2,2,1),
                              "Hand:Side_left:right"  = c(15,4,2,2,1),
```

```
                                "Hand:Side_right:left"  = c(15,7,4,2,1),
                                "Hand:Side_right:right" = c(5,8,5,3,1)))

boxplot(dat$RT ~ dat$Hand + dat$Side)
table(dat$Error, dat$Hand, dat$Side)
```

---

aovDispMeans *aovDispMeans*

Description

Displays marginal means from model.tables in the command window.

Usage

```
aovDispMeans(aovObj, value = "value", caption = sys.call())
```

Arguments

aovObj	Output from aov or ezANOVA (NB. ezANOVA must be called with \"return_aov = TRUE\"")
value	String for column name
caption	Required for heading

Examples

```
# Example 1:
# create dataframe
dat <- createDF(nVP = 50, nTrl = 1,
                design = list("Comp" = c("comp", "incomp")))

dat <- addDataDF(dat, RT = list("Comp_comp"   = c(500, 100, 100),
                                "Comp_incomp" = c(520, 100, 100)))

aovRT <- aov(RT ~ Comp + Error(VP/(Comp)), dat)
aovDispMeans(aovRT)

# or with ezANOVA
library(ez)
aovRT <- ezANOVA(dat, dv=.(RT), wid = .(VP), within = .(Comp),
                 return_aov = TRUE, detailed = TRUE)
aovRT <- aovTable(aovRT)
aovDispMeans(aovRT)
```

aovDispTable *aovDispTable*

Description

Display formatted ANOVA table in command window.

Usage

```
aovDispTable(aovObj, caption = sys.call())
```

Arguments

aovObj	Output from aov or ezANOVA
caption	Required for heading

Examples

```
# Example 1:
# create dataframe
dat <- createDF(nVP = 6, nTrl = 1,
                design = list("Comp" = c("comp", "incomp")))

dat <- addDataDF(dat, RT = list("Comp_comp"   = c(500, 150, 100),
                                "Comp_incomp" = c(520, 150, 100)))

aovObj <- aov(RT ~ Comp + Error(VP/(Comp)), dat)
aovDispTable(aovObj)

# or with ezANOVA
library(ez)
aovRT <- ezANOVA(dat, dv=.(RT), wid = .(VP), within = .(Comp), return_aov = TRUE, detailed = TRUE)
aovDispTable(aovRT)
```

aovEffectSize *aovEffectSize*

Description

Add effect size to ANOVA table. Effect sizes: partial eta squared (pes), vs. ges (generalized eta squared, NB: default when using ezANOVA).

Usage

```
aovEffectSize(aovObj, effectSize = "pes")
```

Arguments

aovObj	Output from aov or ezANOVA
effectSize	Effect size (pes vs. ges)

Value

list

Examples

```
# Example 1:
# create dataframe with 2(Comp: comp vs. incomp) and 2(Side: left vs. right) factors/levels
dat <- createDF(nVP = 20, nTrl = 1,
                design = list("Comp" = c("comp", "incomp", "neutral"),
                              "Side" = c("left", "right")))

dat <- addDataDF(dat,
                 RT = list("Comp:Side_comp:left"     = c(500, 150, 150),
                           "Comp:Side_comp:right"    = c(500, 150, 150),
                           "Comp:Side_incomp:left"   = c(550, 150, 150),
                           "Comp:Side_incomp:right"  = c(550, 150, 150),
                           "Comp:Side_neutral:left"  = c(525, 150, 150),
                           "Comp:Side_neutral:right" = c(525, 150, 150)))

aovRT <- aov(RT ~ Comp * Side + Error(VP/(Comp*Side)), dat)
aovRT <- aovEffectSize(aovRT)
aovRT <- aovDispTable(aovRT)

# or with ezANOVA
library(ez)
aovRT <- ezANOVA(dat, dv=.(RT), wid = .(VP), within = .(Comp, Side),
                 return_aov = TRUE, detailed = TRUE)
aovRT <- aovEffectSize(aovRT)
aovDispTable(aovRT)
```

---

aovJackknifeAdjustment

adjustJackknifeAdjustment

Description

Adjust ezANOVA table with corrected F (Fc = F/(n-1)^2) and p values for jackkniffed data (see Ulrich and Miller, 2001. Using the jackknife-based scoring method for measuring LRP onset effects in factorial designs. Psychophysiology, 38, 816-827.)

Usage

```
aovJackknifeAdjustment(aovObj, numVPs)
```

Arguments

aovObj	Output from aov or ezANOVA
numVPs	The number of participants

Value

list

Examples

```
# Example 1:
# create dataframe with 2(Comp: comp vs. incomp) and 2(Side: left vs. right) factors/levels
dat <- createDF(nVP = 20, nTrl = 1,
                design = list("Comp" = c("comp", "incomp"),
                              "Side" = c("left", "right")))

dat <- addDataDF(dat,
                 RT = list("Comp:Side_comp:left"    = c(500, 150, 150),
                           "Comp:Side_comp:right"   = c(500, 150, 150),
                           "Comp:Side_incomp:left"  = c(500, 150, 150),
                           "Comp:Side_incomp:right" = c(500, 150, 150)))

aovRT <- aov(RT ~ Comp*Side + Error(VP/(Comp*Side)), dat)
aovRT <- aovJackknifeAdjustment(aovRT, length(unique(dat$VP)))
aovDispTable(aovRT)

# or with ezANOVA
library(ez)
aovRT <- ezANOVA(dat, dv=.(RT), wid = .(VP), within = .(Comp, Side),
                 return_aov = TRUE, detailed = TRUE)
aovRT <- aovJackknifeAdjustment(aovRT, length(unique(dat$VP)))
aovDispTable(aovRT)
```

---

aovRoundDigits *aovRoundDigits*

Description

Round digits to n decimal places in ezANOVA table

Usage

```
aovRoundDigits(aovObj, nsmall = 2)
```

Arguments

aovObj	Output from aov or ezANOVA
nsmall	Number of digits to round to within ANOVA table

Value

dataframe

Examples

```
# Example 1:
# create dataframe with 2(Comp: comp vs. incomp) and 2(Side: left vs. right) factors/levels
dat <- createDF(nVP = 20, nTrl = 1,
                design = list("Comp" = c("comp", "incomp"),
                              "Side" = c("left", "right")))

dat <- addDataDF(dat,
                 RT = list("Comp:Side_comp:left"    = c(500, 150, 150),
                           "Comp:Side_comp:right"   = c(500, 150, 150),
                           "Comp:Side_incomp:left"  = c(500, 150, 150),
                           "Comp:Side_incomp:right" = c(500, 150, 150)))

aovRT <- aov(RT ~ Comp*Side + Error(VP/(Comp*Side)), dat)
aovRT <- aovRoundDigits(aovRT, 2)
aovDispTable(aovRT)

# or using ezANOVA
library(ez)
aovRT <- ezANOVA(dat, dv=.(RT), wid = .(VP), within = .(Comp, Side),
                 return_aov = TRUE, detailed = TRUE)
aovRT <- aovRoundDigits(aovRT, 3)
aovDispTable(aovRT)
```

`aovSphericityAdjustment` *aovSphericityAdjustment*

Description

Adjust ezANOVA table with corrections for sphericity (Greenhouse-Geisser or Huynh-Feldt). Called by default within aovTable

Usage

```
aovSphericityAdjustment(aovObj, type = "GG")
```

Arguments

`aovObj`	The returned object from a call to ezANOVA
`type`	"GG" (Greenhouse-Geisser) or "HF" (Huynh-Feldt)

Value

list

Examples

```
# Example 1:
# create dataframe with 3(Comp: neutral vs. comp vs. incomp) factors/levels
dat <- createDF(nVP = 20, nTrl = 1,
                design = list("Comp" = c("neutral", "comp", "incomp")))

dat <- addDataDF(dat,
                 RT = list("Comp_neutral" = c(510, 150, 100),
                           "Comp_comp"    = c(500, 150, 100),
                           "Comp_incomp"  = c(520, 150, 100)))

# using ezANOVA
library(ez)
aovRT <- ezANOVA(dat, dv=.(RT), wid = .(VP), within = .(Comp),
                 return_aov = TRUE, detailed = TRUE)
aovDispTable(aovRT)
aovRT <- aovSphericityAdjustment(aovRT)
aovDispTable(aovRT)
```

---

aovTable *aovTable*

Description

Adjust ezANOVA table output. Options include calculation of alternative effect sizes (eta squared, partial eta squared), the calculation of marginal means and formatting options for the ANOVA table (e.g., detailed, rounding).

Usage

```
aovTable(
  aovObj,
  effectSize = "pes",
  sphericityCorrections = TRUE,
  sphericityCorrectionType = "GG",
  removeSumSquares = TRUE,
  roundDigits = TRUE,
  numDigits = 2
)
```

Arguments

aovObj	Output from aov or ezANOVA (NB. ezANOVA must be called with detailed = TRUE)
effectSize	Effect size (pes vs. ges)
sphericityCorrections	TRUE/FALSE (ezANOVA)
sphericityCorrectionType	"GG" (default) vs. "HF" (ezANOVA)
removeSumSquares	TRUE/FALSE Remove SSn/SSd columns from the ANOVA table
roundDigits	TRUE/FALSE Round numerical values to numDigits
numDigits	The number of digits to round to if roundDigits = TRUE

Value

list

Examples

```
# Example 1:
# create dataframe with 2(Comp: comp vs. incomp) and 2(Side: left vs. right) factors/levels
dat <- createDF(nVP = 20, nTrl = 1,
                design = list("Comp" = c("comp", "incomp"),
                              "Side" = c("left", "right")))

dat <- addDataDF(dat,
                 RT = list("Comp:Side_comp:left"    = c(500, 150, 150),
                           "Comp:Side_comp:right"   = c(500, 150, 150),
                           "Comp:Side_incomp:left"  = c(500, 150, 150),
                           "Comp:Side_incomp:right" = c(500, 150, 150)))

aovRT <- aov(RT ~ Comp*Side + Error(VP/(Comp*Side)), dat)
aovRT <- aovTable(aovRT)

# or using ezANOVA
library(ez)
aovRT <- ezANOVA(dat, dv=.(RT), wid = .(VP), within = .(Comp, Side),
                 return_aov = TRUE, detailed = TRUE)
aovRT <- aovTable(aovRT)
```

---

aovTidyTable *aovTidyTable*

Description

Take output from base aov function and produce a "tidy" ANOVA table similar to the output of ezANOVA. The output also contains the marginal means.

Usage

```
aovTidyTable(aovObj)
```

Arguments

aovObj	Output from aov function

Value

list

Examples

```
# create dataframe
dat <- createDF(nVP = 6, nTrl = 1,
                design = list("Comp" = c("comp", "incomp")))

dat <- addDataDF(dat, RT = list("Comp_comp"   = c(500, 150, 100),
                                "Comp_incomp" = c(520, 150, 100)))

aovObj <- aov(RT ~ Comp + Error(VP/(Comp)), dat)
aovObj <- aovTidyTable(aovObj)
aovObj$ANOVA
printTable(aovObj$ANOVA, digits = c(0,2,3,4,5,6))
```

---

ciStrT *ciStrT*

Description

Returns a string with the 95% CI from a t.test in Latex format.

Usage

```
ciStrT(tObj, numDigits = 0, unit = "")
```

Arguments

tObj	The returned object from a call to t.test
numDigits	The number of digits to round to
unit	"" vs. "ms" vs. "mv" vs. "%"

Value

character

Examples

```
requiredPackages(c("dplyr"))

# Example 1:
# create dataframe and add data with 2(Comp: comp vs. incomp) levels
dat <- createDF(nVP = 20,
                nTrl = 50,
                design = list("Comp" = c("comp", "incomp")))

dat <- addDataDF(dat, RT = list("Comp_comp"   = c(500, 150, 100),
                                "Comp_incomp" = c(520, 150, 100)))

# aggregate dat across trials
datAggVP <- dat %>%
    group_by(VP, Comp) %>%
    summarize(N  = n(),
              rt = mean(RT))

tObj <- t.test(datAggVP$rt[datAggVP$Comp == "comp"],
               datAggVP$rt[datAggVP$Comp == "incomp"],
               paired = TRUE)

ciString <- ciStrT(tObj, unit = "ms")
```

`createDF` *createDF*

Description

Create dataframe (see also addDataDF)

Usage

```
createDF(
  nVP = 20,
  nTrl = 50,
  design = list(A = c("A1", "A2"), B = c("B1", "B2"))
)
```

Arguments

`nVP`	Number of participants
`nTrl`	Number of trials per factor/level for each participant
`design`	Factors and levels

Value

dataframe

Examples

```
# Example 1
dat <- createDF()

# Example 2
dat <- createDF(nVP = 50, nTrl = 50, design = list("Comp" = c("comp", "incomp")))

# Example 3
dat <- createDF(nVP = 50, nTrl = 50, design = list("Comp" = c("comp", "incomp"),
                                                   "Side" = c("left", "right", "middle")))
```

---

effectsizeValueString *effectsizeValueString*

Description

Returns required Latex formatted string for effect size (partial eta squared) = XXX for R/knitr integration. Returns values to 2 sig decimal places.

Usage

```
effectsizeValueString(aovObj, effect, effectSize = "pes")
```

Arguments

aovObj	Output from aov or ezANOVA (NB. ezANOVA must be called with detailed = TRUE)
effect	The effect within the ANOVA table to return
effectSize	pes (partial eta squared) vs. ges (generalised eta squared)

Value

character

Examples

```
# Example 1:
# create dataframe and add data with 2(Comp: comp vs. incomp) and 2(Side: left vs. right)
dat <- createDF(nVP = 20, nTrl = 1,
                design = list("Comp" = c("comp", "incomp"),
                              "Side" = c("left", "right")))

dat <- addDataDF(dat, RT = list("Comp:Side_comp:left"    = c(500, 150, 100),
                                "Comp:Side_comp:right"   = c(500, 150, 100),
                                "Comp:Side_incomp:left"  = c(520, 150, 100),
                                "Comp:Side_incomp:right" = c(520, 150, 100)))
```

```
aovRT <- aov(RT ~ Comp*Side + Error(VP/(Comp*Side)), dat)
aovRT <- aovTable(aovRT)

pesString <- effectsizeValueString(aovRT, "Comp")  # partial eta squared
pesString <- effectsizeValueString(aovRT, "Comp:Side")

# or using ezANOVA
library(ez)
aovRT <- ezANOVA(dat, dv=.(RT), wid = .(VP), within = .(Comp, Side),
                 return_aov = TRUE, detailed = TRUE)
aovRT <- aovTable(aovRT)

pesString <- effectsizeValueString(aovRT, "Comp")  # partial eta squared
pesString <- effectsizeValueString(aovRT, "Comp:Side")
```

`errDist` *errDist*

Description

Returns a random vector of 0's (correct) and 1's (incorrect) with defined proportions (default = 10% errors).

Usage

```
errDist(n = 10000, proportion = 10)
```

Arguments

`n`	Number
`proportion`	Approximate proportion of errors in percentage

Value

double

Examples

```
# Example 1: approx 10% errors
x <- errDist(1000)
table(x)

# Example 2: approx 20% errors
x <- errDist(1000, 20)
table(x)
```

fValueString *fValueString*

Description

Returns required Latex formatted string for F(df1, df2) = XXX for R/knitr integration. For example, $F(1, 23) = 3.45$. Returns values to 2 sig decimal places.

Usage

```
fValueString(aovObj, effect)
```

Arguments

aovObj	Output from aov or ezANOVA (NB. ezANOVA must be called with detailed = TRUE)
effect	The effect within the ANOVA table to return

Value

character

Examples

```
# Example 1:
# create dataframe and add data with 2(Comp: comp vs. incomp) and 2(Side: left vs. right)
dat <- createDF(nVP = 20, nTrl = 1,
                design = list("Comp" = c("comp", "incomp"),
                              "Side" = c("left", "right")))

dat <- addDataDF(dat, RT = list("Comp:Side_comp:left"    = c(500, 150, 100),
                                "Comp:Side_comp:right"   = c(500, 150, 100),
                                "Comp:Side_incomp:left"  = c(520, 150, 100),
                                "Comp:Side_incomp:right" = c(520, 150, 100)))

# or using ezANOVA
library(ez)
aovRT <- ezANOVA(dat, dv=.(RT), wid = .(VP), within = .(Comp, Side),
                 return_aov = TRUE, detailed = TRUE)
aovRT <- aovTable(aovRT)

fString <- fValueString(aovRT, "Comp")
fString <- fValueString(aovRT, "Comp:Side")
```

mathString *mathString*

Description

Returns formatted string following addition/subtraction.

Usage

```
mathString(str1, str2, operation = "-", numDigits = 0, unit = "ms")
```

Arguments

str1	string
str2	string
operation	"+", "-", "*", "/"
numDigits	number 0 (default)
unit	"ms" , "mV" , "mv", or "%"

Examples

```
# Example 1:
string <- mathString("550 ms", "480 ms", "-")

# Example 2:
string <- mathString("2.34", "1.65", "+", numDigits = 2, unit = "mV")
```

meanStrAov *meanStrAov*

Description

Returns marginal means from ezANOVA object for requested effect in Latex format. Assumes means added to aovObj (e.g., aovObj$means <- model.tables(aovObj$aov, type = "mean").

Usage

```
meanStrAov(aovObj, effect, level, unit = "ms", numDigits = 0)
```

Arguments

aovObj	Output from aov or ezANOVA (NB. ezANOVA must be called with detailed = TRUE)
effect	Effect to return
level	Level of effect
unit	"ms" vs. "mv" vs. "%"
numDigits	"ms" vs. "mv" vs. "%"

Value

character

Examples

```
# Example 1:
# create dataframe and add data with 2(Comp: comp vs. incomp) and 2(Side: left vs. right)
dat <- createDF(nVP = 20, nTrl = 1,
                design = list("Comp" = c("comp", "incomp"),
                              "Side" = c("left", "right")))

dat <- addDataDF(dat, RT = list("Comp:Side_comp:left"    = c(500, 150, 100),
                                "Comp:Side_comp:right"   = c(500, 150, 100),
                                "Comp:Side_incomp:left"  = c(520, 150, 100),
                                "Comp:Side_incomp:right" = c(520, 150, 100)))

aovRT <- aov(RT ~ Comp*Side + Error(VP/(Comp*Side)), dat)
aovRT <- aovTable(aovRT)

meanString <- meanStrAov(aovRT, "Comp", "comp")
meanString <- meanStrAov(aovRT, "Comp:Side", "incomp:left")

# or using ezANOVA
library(ez)
aovRT <- ezANOVA(dat, dv=.(RT), wid = .(VP), within = .(Comp, Side),
                 return_aov = TRUE, detailed = TRUE)
aovRT <- aovTable(aovRT)

meanString <- meanStrAov(aovRT, "Comp", "comp")
meanString <- meanStrAov(aovRT, "Comp:Side", "incomp:left")
```

---

meanStrT *meanStrT*

Description

Returns a string with the mean value from a t.test in Latex format.

Usage

```
meanStrT(tObj, numDigits = 0, unit = "")
```

Arguments

tObj	The returned object from a call to t.test
numDigits	The number of digits to round to
unit	"" vs. "ms" vs. "mv" vs. "%"

Value

character

Examples

```
library(psychReport)
requiredPackages(c("dplyr"))
# Example 1:
# create dataframe and add data
dat <- createDF(nVP = 10,
                nTrl = 50,
                design = list("Comp" = c("comp", "incomp")))

dat <- addDataDF(dat, RT = list("Comp_comp"   = c(500, 150, 100),
                                "Comp_incomp" = c(520, 150, 100)))

# aggregate dat across trials
datAggVP <- dat %>%
    group_by(VP, Comp) %>%
    summarize(N = n(),
              rt = mean(RT))

tObj <- t.test(datAggVP$rt[dat$Comp == "comp"],
               datAggVP$rt[dat$Comp == "incomp"],
               paired = TRUE)

tString <- meanStrT(tObj, numDigits = 0, unit = "ms")
```

---

numValueString *numValueString*

Description

Returns numerical value with requested unit in Latex format with numDigits number of decimal places and unit symbol.

Usage

```
numValueString(value, numDigits = 2, unit = "")
```

Arguments

value	number
numDigits	number 2 (default)
unit	"ms", "mv", "mV", or "%" or "" (default)

Value

character

Examples

```
# Example 1:
string <- numValueString(100.341, 0, "ms")

# Example 2:
string <- numValueString(2.3412, 2, "mv")

# Example 3:
string <- numValueString(63.9812, 2, "")
```

---

printAovMeans *printAovMeans*

Description

Returns Latex formatted table of marginal means from model.tables. Uses printTable (xtable) latex package with some basic defaults. For more examples, see R package xtable

Usage

```
printAovMeans(..., caption = "Mean", digits = 3, dv = "ms")
```

Arguments

...	Output from aov or ezANOVA (NB. ezANOVA must be called with detailed = TRUE)
caption	Title for the table
digits	Number of digits to round to
dv	Name of the dependent variable (e.g., "ms", "%")

Value

character

Examples

```
# Example 1:
# create dataframe
dat <- createDF(nVP = 6, nTrl = 1,
                design = list("Comp" = c("comp", "incomp")))

dat <- addDataDF(dat, RT = list("Comp_comp"   = c(500, 150, 100),
                                "Comp_incomp" = c(520, 150, 100)))

aovRT <- aov(RT ~ Comp + Error(VP/(Comp)), dat)
aovRT <- aovTable(aovRT)
printAovMeans(aovRT, digits = 3, dv = "ms")  # latex formatted

# or using ezANOVA
library(ez)
aovRT <- ezANOVA(dat, dv=.(RT), wid = .(VP), within = .(Comp), return_aov = TRUE, detailed = TRUE)
aovRT <- aovTable(aovRT)
printAovMeans(aovRT, digits = 0, dv = "ms")  # latex formatted
```

---

printTable *printTable*

Description

Returns Latex formatted table from dataframe or ezANOVA ANOVA table. Uses xtable latex package with some basic defaults. For more examples, see R package xtable

Usage

```
printTable(
  obj,
  caption = "DF",
  digits = 3,
  onlyContents = FALSE,
  formatStatsSymbols = TRUE
)
```

Arguments

obj	Dataframe/ezANOVA object to print
caption	Title of the dataframe
digits	Number of digits to round to NB. length can be 1, or vector with length equal to the number of numeric columns

onlyContents TRUE/FALSE

formatStatsSymbols TRUE/FALSE

Value

character

Examples

```
requiredPackages(c("dplyr", "ez"))

# Example 1:
# create dataframe
dat <- createDF(nVP = 6, nTrl = 1,
                design = list("Comp" = c("comp", "incomp")))

dat <- addDataDF(dat, RT = list("Comp_comp"   = c(500, 150, 100),
                                "Comp_incomp" = c(520, 150, 100)))
printTable(dat, digits = 1) # latex formatted

dat$VP <- as.factor(dat$VP)
aovRT <- ezANOVA(dat, dv=.(RT), wid = .(VP), within = .(Comp),
                 return_aov = TRUE, detailed = TRUE)
aovRT <- aovTable(aovRT)
printTable(aovRT$ANOVA, digits = c(0, 0, 2, 2, 2)) # latex formatted
```

---

pValueString *pValueString*

Description

Returns Latex formatted string from a p-value required for R/knitr integration. For example, $p = 0.11$ or $p < 0.01$ Returns values to 2 sig decimal places if p-value >= 0.05.

Usage

```
pValueString(pVal, nsmall = 2)
```

Arguments

pVal	p-value between 0 and 1
nsmall	Number of small digits to round to

Value

character

Examples

```
# Example 1:
pString <- pValueString(0.67)

# Example 2:
pString <- pValueString(0.1234, 3)

# Example 3:
pString <- pValueString("0.03")
```

---

pValueSummary *pValueSummary*

Description

Returns p-values summarized using ***, **, *, or exact value when $p > .05$ (default 2 significant decimal places).

Usage

```
pValueSummary(pVal)
```

Arguments

pVal	vector with p-value between 0 and 1

Value

character

Examples

```
# Examples:
psum <- pValueSummary(0.0067)
psum <- pValueSummary(c(0.0001, 0.002, 0.02, 0.1))
```

requiredPackages *requiredPackages*

Description

Installs (default if required) and loads specified packages.

Usage

```
requiredPackages(
  packages,
  installPackages = FALSE,
  lib = .libPaths()[1],
  repos = "http://cran.us.r-project.org"
)
```

Arguments

packages	A list of packages
installPackages	TRUE/FALSE Install package if not installed
lib	character vector giving the library directories where to install the packages. Recycled as needed. If missing, defaults to the first element of .libPaths()
repos	character vector, the base URL(s) of the repositories to use, e.g., the URL of a CRAN mirror such as "https://cloud.r-project.org". For more details on supported URL schemes see url. Can be NULL to install from local files, directories or URLs: this will be inferred by extension from pkgs if of length one.

rtDist *rtDist*

Description

Returns value(s) from a distribution appropriate to simulate reaction times. The distribution is a combined exponential and gaussian distribution called an exponentially modified Gaussian (EMG) distribution or ex-gaussian distribution.

Usage

```
rtDist(n = 10000, gaussMean = 600, gaussSD = 50, expRate = 200)
```

Arguments

n	Number of observations
gaussMean	Mean of the gaussian distribution
gaussSD	SD of the gaussian distribution
expRate	Rate of the exponential function

Value

double

Examples

```
# Example 1:
x <- rtDist()
hist(x, 100)

# Example 2:
x <- rtDist(n=20000, gaussMean=800, gaussSD=50, expRate=100)
hist(x, 100)
```

---

sphericityValueString *sphericityValueString*

Description

Returns required Latex formatted string for sphericity epsilon values (HF, GG) = XXX for R/knitr integration. Returns values to 2 sig decimal places.

Usage

```
sphericityValueString(aovObj, effect)
```

Arguments

aovObj	The returned object from a call to ezANOVA
effect	The effect within the ANOVA table to return

Value

character

Examples

```
# Example 1
# create dataframe and add data with 3(Comp: neutral vs. comp vs. incomp) levels
dat <- createDF(nVP = 20, nTrl = 1,
                design = list("Comp" = c("neutral", "comp", "incomp")))

dat <- addDataDF(dat, RT = list("Comp_neutral" = c(510, 150, 100),
                                "Comp_comp"    = c(500, 150, 100),
                                "Comp_incomp"  = c(520, 150, 100)))

# repeated measures ANOVA using ezANOVA
library(ez)
aovRT <- ezANOVA(dat, dv=.(RT), wid = .(VP), within = .(Comp),
                 return_aov = TRUE, detailed = TRUE)
aovRT <- aovTable(aovRT)

sphericityValue <- sphericityValueString(aovRT, "Comp")
```

`statStrAov` *statStrAov*

Description

Returns Latex formatted string from ANOVA required for R/knitr integration. For example,

$$F(1, 20) = 8.45, p < 0.01, pes = 0.45$$

Returns values to 2 sig decimal places and < 0.01, < 0.001 for p values.

Usage

```
statStrAov(aovObj, effect)
```

Arguments

`aovObj`	Output from aov or ezANOVA (NB. ezANOVA must be called with detailed = TRUE)
`effect`	The effect required from the anova table

Examples

```
# Example 1:
# create dataframe and add data with 2(Comp: comp vs. incomp) and 2(Side: left vs. right)
dat <- createDF(nVP = 20, nTrl = 1,
                design = list("Comp" = c("comp", "incomp"),
                              "Side" = c("left", "right")))

dat <- addDataDF(dat, RT = list("Comp:Side_comp:left"    = c(500, 150, 100),
```

```
                                  "Comp:Side_comp:right"   = c(500, 150, 100),
                                  "Comp:Side_incomp:left"  = c(520, 150, 100),
                                  "Comp:Side_incomp:right" = c(520, 150, 100)))

aovRT <- aov(RT ~ Comp*Side + Error(VP/(Comp*Side)), dat)
aovRT <- aovTable(aovRT)

aovString <- statStrAov(aovRT, "Comp")
aovString <- statStrAov(aovRT, "Comp:Side")


# or using ezANOVA
library(ez)
aovRT <- ezANOVA(dat, dv=.(RT), wid = .(VP), within = .(Comp, Side),
                 return_aov = TRUE, detailed = TRUE)
aovRT <- aovTable(aovRT)

aovString <- statStrAov(aovRT, "Comp")
aovString <- statStrAov(aovRT, "Comp:Side")
```

---

statStrT *statStrT*

Description

Returns required Latex formatted string T-test required for R/Knitr integration. For example, $t(11) = 3.45$, $p < 0.05$. Returns values to 2 sig decimal places and < 0.01, < 0.001 for p values.

Usage

```
statStrT(tObj)
```

Arguments

tObj	The returned object from a call to t.test

Value

character

Examples

```
requiredPackages(c("dplyr"))

# Example 1:
# create dataframe and add data with 2(Comp: comp vs. incomp) levels
dat <- createDF(nVP = 20,
                nTrl = 50,
                design = list("Comp" = c("comp", "incomp")))
```

```
dat <- addDataDF(dat, RT = list("Comp_comp"   = c(500, 150, 100),
                                "Comp_incomp" = c(520, 150, 100)))

# aggregate dat across trials
datAggVP <- dat %>%
    group_by(VP, Comp) %>%
    summarize(N  = n(),
              rt = mean(RT))

tObj <- t.test(datAggVP$rt[datAggVP$Comp == "comp"],
               datAggVP$rt[datAggVP$Comp == "incomp"],
               paired = TRUE)

statStrT <- statStrT(tObj)
```

---

tValueString *tValueString*

Description

Returns required Latex formatted string for *t*(df) = XXX for R/knitr integration. Returns values to 2 sig decimal places.

Usage

```
tValueString(tObj)
```

Arguments

tObj	The returned object from a call to t.test

Value

character

Examples

```
requiredPackages(c("dplyr"))

# Example 1:
# create dataframe and add data with 2(Comp: comp vs. incomp) levels
dat <- createDF(nVP = 20,
                nTrl = 50,
                design = list("Comp" = c("comp", "incomp")))

dat <- addDataDF(dat, RT = list("Comp_comp"   = c(500, 150, 100),
                                "Comp_incomp" = c(520, 150, 100)))
```

```
# aggregate dat across trials
datAggVP <- dat %>%
    group_by(VP, Comp) %>%
    summarize(N = n(),
              rt = mean(RT))

tObj <- t.test(datAggVP$rt[datAggVP$Comp == "comp"],
               datAggVP$rt[datAggVP$Comp == "incomp"],
               paired = TRUE)

tString <- tValueString(tObj)
```

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