Quick R for Statistics

Chia-Ching Wu

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Contents

R

Chapter 1

R

1.1

1.1.1

1.1.2

R setwd(“ ”) \ setwd(“D:\DIR1\DIR2\DIR3”) getwd()

```
setwd("D:\\dropbox\\Working\\  ")
getwd()
```

```
## [1] "D:/Dropbox/Working/  "
```

1.1.3

xlsx read.xlsx() excel java

```
library(xlsx)
gData <- read.xlsx(" .xlsx", 1, encoding = "UTF-8", stringsAsFactors=FALSE)
head(gData)
```

```
##
## 1 102368014    M    9  8.5    24.05          8.5     32     28
## 2 102368018    M   10  9.5    24.26          8.5     66     59
## 3 102368024    F    9    8    24.05          8.5     69     68
## 4 102368027    F    9    8    24.05          8.5     68   83.5
## 5 102368030    F   11    0    18.92            7     39     30
## 6 100368033    M    4   12       20            8     58     79
```

readxl read_xlsx() excel java

```
library(readxl)
gData <- read_xlsx(" .xlsx")
```

1.2

```
gData <- gData[gData$   != ".", ]
```

1.2.1

RStudio Environment dataframe str( ) dataframe

```
str(gData)
```

```
## 'data.frame':    57 obs. of  8 variables:
##  $          : chr  "102368014" "102368018" "102368024" "102368027" ...
##  $          : chr  "M" "M" "F" "F" ...
##  $          : num  9 10 9 9 11 4 4 4 6 6 ...
##  $          : chr  "8.5" "9.5" "8" "8" ...
##  $       : chr  "24.05" "24.26" "24.05" "24.05" ...
##  $    : chr  "8.5" "8.5" "8.5" "8.5" ...
##  $         : chr  "32" "66" "69" "68" ...
##  $         : chr  "28" "59" "68" "83.5" ...
```

1.2.2

as.numeric()

```
gData$   <- as.numeric(gData$ )
str(gData)
```

```
## 'data.frame':    57 obs. of  8 variables:
##  $          : chr  "102368014" "102368018" "102368024" "102368027" ...
##  $          : chr  "M" "M" "F" "F" ...
##  $          : num  9 10 9 9 11 4 4 4 6 6 ...
##  $          : chr  "8.5" "9.5" "8" "8" ...
##  $       : chr  "24.05" "24.26" "24.05" "24.05" ...
##  $    : chr  "8.5" "8.5" "8.5" "8.5" ...
##  $         : num  32 66 69 68 39 58 67 55 40 54 ...
##  $         : chr  "28" "59" "68" "83.5" ...
```

sapply

```
gData[c(4:8)] <- sapply(gData[c(4:8)], as.numeric)
str(gData)
```

```
## 'data.frame':    57 obs. of  8 variables:
##  $          : chr  "102368014" "102368018" "102368024" "102368027" ...
##  $          : chr  "M" "M" "F" "F" ...
##  $          : num  9 10 9 9 11 4 4 4 6 6 ...
##  $          : num  8.5 9.5 8 8 0 12 12 5 12 12 ...
##  $       : num  24.1 24.3 24.1 24.1 18.9 ...
##  $    : num  8.5 8.5 8.5 8.5 7 8 8 8 8 8 ...
##  $         : num  32 66 69 68 39 58 67 55 40 54 ...
##  $         : num  28 59 68 83.5 30 79 78 56.5 49.5 60.5 ...
```

1.2.3

table()

```
table(gData$ )
gTable1 <- as.data.frame(table(gData$ ))
gTable2 <- as.data.frame(table(gData$ ))
gTable1
```

```
##
##  F  M
## 30 27
##   Var1 Freq
## 1    F   30
## 2    M   27
```

```
table(gData$ , gData$ )
as.data.frame(rbind(table(gData$ , gData$ )))
```

```
##
##     1 2 3 4 5 6 7 8 9 10 11 12
##   F 1 4 5 4 2 2 3 1 2  2  3  1
##   M 3 2 2 2 3 3 1 4 1  3  1  2
##   1 2 3 4 5 6 7 8 9 10 11 12
## F 1 4 5 4 2 2 3 1 2  2  3  1
## M 3 2 2 2 3 3 1 4 1  3  1  2
```

1.3

30 10

1.3.1

```
gData$    <- gData$   / 30 * 100
gData$     <- gData$    / 10 * 100
head(gData)
```

```
##
## 1 102368014    M    9  8.5    24.05          8.5     32   28.0   80.16667
## 2 102368018    M   10  9.5    24.26          8.5     66   59.0   80.86667
## 3 102368024    F    9  8.0    24.05          8.5     69   68.0   80.16667
## 4 102368027    F    9  8.0    24.05          8.5     68   83.5   80.16667
## 5 102368030    F   11  0.0    18.92          7.0     39   30.0   63.06667
## 6 100368033    M    4 12.0    20.00          8.0     58   79.0   66.66667
##
## 1             85
## 2             85
## 3             85
## 4             85
## 5             70
## 6             80
```

1.3.2

2 rowMeans()

```
gData$  <- (gData$    + gData$    )/2
gData$  <- rowMeans(gData[,c("   ", "    ")], na.rm=TRUE)
head(gData)
```

```
##
## 1 102368014    M    9  8.5    24.05          8.5     32   28.0   80.16667
## 2 102368018    M   10  9.5    24.26          8.5     66   59.0   80.86667
## 3 102368024    F    9  8.0    24.05          8.5     69   68.0   80.16667
## 4 102368027    F    9  8.0    24.05          8.5     68   83.5   80.16667
## 5 102368030    F   11  0.0    18.92          7.0     39   30.0   63.06667
## 6 100368033    M    4 12.0    20.00          8.0     58   79.0   66.66667
##
## 1             85 82.58333
## 2             85 82.93333
## 3             85 82.58333
## 4             85 82.58333
## 5             70 66.53333
## 6             80 73.33333
```

1.3.3

(1) [,] (2)subset(, , select=c( ))

```
gData1 <- gData[,-c(5,6,9,10)]
gData1 <- subset(gData, select = c(" ", " ", " ", " ", " ", "  ", "  "))
head(gData1)
```

```
##
## 1 102368014    M    9  8.5 82.58333     32   28.0
## 2 102368018    M   10  9.5 82.93333     66   59.0
## 3 102368024    F    9  8.0 82.58333     69   68.0
## 4 102368027    F    9  8.0 82.58333     68   83.5
## 5 102368030    F   11  0.0 66.53333     39   30.0
## 6 100368033    M    4 12.0 73.33333     58   79.0
```

+ +

```
gData1$   <- (gData1$   + gData1$   + gData1$ )/3 + gData1$
head(gData1)
```

```
##
## 1 102368014    M    9  8.5 82.58333     32   28.0 56.02778
## 2 102368018    M   10  9.5 82.93333     66   59.0 78.81111
## 3 102368024    F    9  8.0 82.58333     69   68.0 81.19444
## 4 102368027    F    9  8.0 82.58333     68   83.5 86.02778
## 5 102368030    F   11  0.0 66.53333     39   30.0 45.17778
## 6 100368033    M    4 12.0 73.33333     58   79.0 82.11111
```

1.3.4

100 60

1.3.4.1

max() min()

```
max(gData1$ )
min(gData1$ )
```

```
## [1] 102.4889
## [1] 45.17778
```

1.3.4.2

which() 100 60

```
gData1[which(gData1$  < 60),]
```

```
##
## 1  102368014    M    9  8.5 82.58333     32     28 56.02778
## 5  102368030    F   11  0.0 66.53333     39     30 45.17778
## 48 103368042    F    4  8.0 73.33333     45      0 47.44444
## 51 103368047    M   12  5.0 77.11667     52     35 59.70556
## 58 103365306    F   11 12.0 66.53333     29     47 59.51111
```

```
gData1[which(gData1$  > 100),]
```

```
##
## 43 103368037    M    5   12 82.46667     89    100 102.4889
```

1.3.4.3

100 100 60 60 60

```
gData1[which(gData1$   > 100),'  '] <- 100
gData1[which(gData1$   < 60 & gData1$   > 59), '  '] <- 60
```

1.3.4.4

which 60 100

```
gData1[which(gData1$   < 60),]
```

```
##
## 1  102368014    M    9  8.5 82.58333     32     28 56.02778
## 5  102368030    F   11  0.0 66.53333     39     30 45.17778
## 48 103368042    F    4  8.0 73.33333     45      0 47.44444
```

```
gData1[which(gData1$   > 100),]
```

```
## [1]
## <0 rows> (or 0-length row.names)
```

59

```
gData1[which(gData1$  == "103368047" | gData1$  == "103365306"),]
```

```
##
## 51 103368047    M   12    5 77.11667     52     35     60
## 58 103365306    F   11   12 66.53333     29     47     60
```

1.4

dataframe RData txt dat csv excel

1.4.1 RData

save() gData1 gData1.RData

```
save(gData1, file = "gData1.RData")
```

1.4.2 csv

R write.csv() csv

```
write.csv(gData1, "gData1.csv")
```

1.4.3 excel

xlsx write.xlsx() excel writexl write_xlsx() java java

```
library(xlsx)
write.xlsx(gData1, file="gData1.xlsx")
```

```
library(writexl)
write_xlsx(gData1, "gData1.xlsx")
```

Chapter 2

R

2.1

xlsx read.xlsx() readxl read_xlsx() gData1.xlsx

```
library(readxl)
gData1 <- read_xlsx("gData1.xlsx")
head(gData1)
```

```
## # A tibble: 6 x 8
##
##   <chr>     <chr> <dbl> <dbl> <dbl>  <dbl>  <dbl>  <dbl>
## 1 102368014 M         9   8.5  82.6     32   28     56.0
## 2 102368018 M        10   9.5  82.9     66   59     78.8
## 3 102368024 F         9   8    82.6     69   68     81.2
## 4 102368027 F         9   8    82.6     68   83.5   86.0
## 5 102368030 F        11   0    66.5     39   30     45.2
## 6 100368033 M         4  12    73.3     58   79     82.1
```

2.2

2.2.1

mean() var() sd()

```
mean(gData1$ )
```

```
## [1] 74.33021
```

```
var(gData1$ )
```

```
## [1] 126.1945
```

```
sd(gData1$ )
```

```
## [1] 11.23363
```

pastecs stat.desc()

```
library(pastecs)
stat.desc(gData1$ , basic=TRUE, desc=TRUE, norm=TRUE, p=0.95)
```

```
##       nbr.val      nbr.null        nbr.na           min           max
##  5.700000e+01  0.000000e+00  0.000000e+00  4.517778e+01  1.000000e+02
##         range           sum        median          mean       SE.mean
##  5.482222e+01  4.236822e+03  7.615556e+01  7.433021e+01  1.487931e+00
##  CI.mean.0.95           var       std.dev      coef.var      skewness
##  2.980684e+00  1.261945e+02  1.123363e+01  1.511314e-01 -1.319156e-01
##      skew.2SE      kurtosis      kurt.2SE    normtest.W    normtest.p
## -2.085114e-01  5.845899e-03  4.690725e-03  9.834611e-01  6.243284e-01
```

2.2.2

pastecs stat.desc()

```
stat.desc(gData1, basic=TRUE, desc=TRUE, norm=TRUE, p=0.95)
```

```
##
## nbr.val      NA   NA  57.000000000  5.700000e+01  5.700000e+01   57.0000000
## nbr.null     NA   NA   0.000000000  1.000000e+00  0.000000e+00    0.0000000
## nbr.na       NA   NA   0.000000000  0.000000e+00  0.000000e+00    0.0000000
## min          NA   NA   1.000000000  0.000000e+00  6.653333e+01   29.0000000
```

```
## max          NA   NA  12.000000000  1.200000e+01  8.433333e+01   89.0000000
## range        NA   NA  11.000000000  1.200000e+01  1.780000e+01   60.0000000
## sum          NA   NA 341.000000000  5.900000e+02  4.424583e+03 3132.0000000
## median       NA   NA   6.000000000  1.100000e+01  7.691667e+01   55.0000000
## mean         NA   NA   5.982456140  1.035088e+01  7.762427e+01   54.9473684
## SE.mean      NA   NA   0.443196430  3.060493e-01  7.378552e-01    1.7633169
## CI.mean      NA   NA   0.887829134  6.130904e-01  1.478102e+00    3.5323481
## var          NA   NA  11.196115288  5.338972e+00  3.103253e+01  177.2293233
## std.dev      NA   NA   3.346059666  2.310622e+00  5.570685e+00   13.3127504
## coef.var     NA   NA   0.559312026  2.232295e-01  7.176473e-02    0.2422819
## skewness     NA   NA   0.234149681 -2.123849e+00 -4.829443e-01    0.2879258
## skew.2SE     NA   NA   0.370107150 -3.357048e+00 -7.633627e-01    0.4551080
## kurtosis     NA   NA  -1.217954593  5.573908e+00 -9.842022e-01   -0.2269468
## kurt.2SE     NA   NA  -0.977281597  4.472480e+00 -7.897197e-01   -0.1821012
## normtest.W   NA   NA   0.939578114  7.297347e-01  8.923611e-01    0.9706089
## normtest.p   NA   NA   0.006802493  6.467050e-09  1.042615e-04    0.1791033
##
## nbr.val      57.00000000  5.700000e+01
## nbr.null      1.00000000  0.000000e+00
## nbr.na        0.00000000  0.000000e+00
## min           0.00000000  4.517778e+01
## max         104.00000000  1.000000e+02
## range       104.00000000  5.482222e+01
## sum        3389.00000000  4.236822e+03
## median       57.00000000  7.615556e+01
## mean         59.45614035  7.433021e+01
## SE.mean       2.41277279  1.487931e+00
## CI.mean       4.83336470  2.980684e+00
## var         331.82393484  1.261945e+02
## std.dev      18.21603510  1.123363e+01
## coef.var      0.30637769  1.511314e-01
## skewness     -0.08459996 -1.319156e-01
## skew.2SE     -0.13372236 -2.085114e-01
## kurtosis      1.06201488  5.845899e-03
## kurt.2SE      0.85215623  4.690725e-03
## normtest.W    0.97173381  9.834611e-01
## normtest.p    0.20188192  6.243284e-01
```

psych describe() type 2 type=2 SPSS

```
library(psych)
summaryTable <- describe(gData1[,4:8], type=2)
summaryTable
```

```
##        vars  n  mean    sd median trimmed   mad   min    max  range  skew
```

Table 2.1: Summary Statistics

Variable	N	Mean	Std. Dev.	Min	Pctl. 25	Pctl. 75	Max
	57	10.351	2.311	0	9.5	12	12
	57	77.624	5.571	66.533	73.333	82.583	84.333
	57	54.947	13.313	29	44	64	89
	57	59.456	18.216	0	49.5	70.5	104
	57	74.33	11.234	45.178	66.567	81.194	100

```
##        1 57 10.35  2.31  11.00   10.79  1.48  0.00  12.00  12.00 -2.24
##        2 57 77.62  5.57  76.92   78.02  8.23 66.53  84.33  17.80 -0.51
##       3 57 54.95 13.31  55.00   54.47 14.83 29.00  89.00  60.00  0.30
##       4 57 59.46 18.22  57.00   59.27 16.31  0.00 104.00 104.00 -0.09
##       5 57 74.33 11.23  76.16   74.31 12.14 45.18 100.00  54.82 -0.14
##        kurtosis   se
##         6.55 0.31
##        -0.88 0.74
##       -0.03 1.76
##        1.43 2.41
##        0.24 1.49
```

vtable st()

```
library(vtable)
# library(kableExtra) # RStudio
st(gData1[,c(4:8)])
```

2.2.3

aggregate()

```
aggregate(gData1$  , by=list(gender=gData1$ ),mean)
```

```
##   gender        x
## 1      F 73.43611
## 2      M 75.32366
```

```
aggregate(gData1$  , by=list(gender=gData1$ ),sd)
```

```
##   gender        x
## 1      F 11.80451
## 2      M 10.69725
```

pastecs stat.desc()

```
by(gData1$  , gData1$ , stat.desc, basic = FALSE, norm = TRUE)
```

```
## gData1$ : F
##       median         mean      SE.mean CI.mean.0.95          var      std.dev
##  74.37222222  73.43611111   2.15519916   4.40787720 139.34650223  11.80451194
##     coef.var     skewness     skew.2SE     kurtosis     kurt.2SE   normtest.W
##   0.16074533  -0.35283642  -0.41326154  -0.10010120  -0.06010311   0.96695587
##   normtest.p
##   0.45958396
## ------------------------------------------------------------
## gData1$ : M
##       median         mean      SE.mean CI.mean.0.95          var      std.dev
##   77.4555556   75.3236626    2.0586874    4.2316925  114.4312289   10.6972533
##     coef.var     skewness     skew.2SE     kurtosis     kurt.2SE   normtest.W
##    0.1420172    0.2638189    0.2945380   -0.4395158   -0.2519967    0.9706505
##   normtest.p
##    0.6190810
```

2.2.4

aggregate() psych describeBy()

```
aggregate(gData1[,4:8],by=list(gender=gData1$ ),mean)
```

```
##   gender
## 1      F 10.28333 76.92611 53.13333 59.35000 73.43611
## 2      M 10.42593 78.40000 56.96296 59.57407 75.32366
```

```
aggregate(gData[,4:8],by=list(gender=gData$ ),summary) #
```

```
describeBy(gData1[,4:5], list(gender=gData1$ ),type=2)
```

```
##
##  Descriptive statistics by group
## gender: F
##      vars  n  mean   sd median trimmed  mad   min   max range  skew kurtosis
##      1 30 10.28 2.59  11.00   10.81 1.48  0.00 12.00  12.0 -2.58     8.21
##      2 30 76.93 6.11  76.74   77.30 8.66 66.53 84.33  17.8 -0.29    -1.24
##        se
##   0.47
```

Table 2.2: Summary Statistics

Variable	N	Mean	Std. Dev.	Min	Pctl. 25	Pctl. 75	Max
	57	10.351	2.311	0	9.5	12	12
	57	77.624	5.571	66.533	73.333	82.583	84.333
	57	54.947	13.313	29	44	64	89
	57	59.456	18.216	0	49.5	70.5	104
	57	74.33	11.234	45.178	66.567	81.194	100

Table 2.3: Summary Statistics

	F			M		
Variable	N	Mean	SD	N	Mean	SD
	30	5.8	3.316	27	6.185	3.431
	30	10.283	2.585	27	10.426	2.008
	30	76.926	6.11	27	78.4	4.9
	30	53.133	12.822	27	56.963	13.797
	30	59.35	19.297	27	59.574	17.301
	30	73.436	11.805	27	75.324	10.697

```
##   1.12
## ------------------------------------------------------------
## gender: M
##      vars  n  mean   sd median trimmed  mad   min   max range  skew kurtosis
##      1 27 10.43 2.01  11.00   10.72 1.48  5.00 12.00   7.0 -1.39     1.13
##      2 27 78.40 4.90  77.12   78.78 7.09 66.53 84.33  17.8 -0.77    -0.17
##        se
##   0.39
##   0.94
```

vTable

```
library(vtable)
st(gData1[,c(4:8)])
```

```
st(gData1, group=' ')
```

2.3

2.3.1

hist()

```
hist(gData1$  )
```

```
## Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
## conversion failure on 'Histogram of gData1$  ' in 'mbcsToSbcs': dot
## substituted for <e7>
```

```
## Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
## conversion failure on 'Histogram of gData1$  ' in 'mbcsToSbcs': dot
## substituted for <b8>
```

```
## Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
## conversion failure on 'Histogram of gData1$  ' in 'mbcsToSbcs': dot
## substituted for <bd>
```

```
## Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
## conversion failure on 'Histogram of gData1$  ' in 'mbcsToSbcs': dot
## substituted for <e6>
```

```
## Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
## conversion failure on 'Histogram of gData1$  ' in 'mbcsToSbcs': dot
## substituted for <88>
```

```
## Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
## conversion failure on 'Histogram of gData1$  ' in 'mbcsToSbcs': dot
## substituted for <90>
```

```
## Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
## conversion failure on 'Histogram of gData1$  ' in 'mbcsToSbcs': dot
## substituted for <e7>
```

```
## Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
## conversion failure on 'Histogram of gData1$  ' in 'mbcsToSbcs': dot
## substituted for <b8>
```

```
## Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
## conversion failure on 'Histogram of gData1$  ' in 'mbcsToSbcs': dot
## substituted for <be>


## Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
## conversion failure on 'gData1$  ' in 'mbcsToSbcs': dot substituted for <e7>


## Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
## conversion failure on 'gData1$  ' in 'mbcsToSbcs': dot substituted for <b8>


## Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
## conversion failure on 'gData1$  ' in 'mbcsToSbcs': dot substituted for <bd>


## Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
## conversion failure on 'gData1$  ' in 'mbcsToSbcs': dot substituted for <e6>

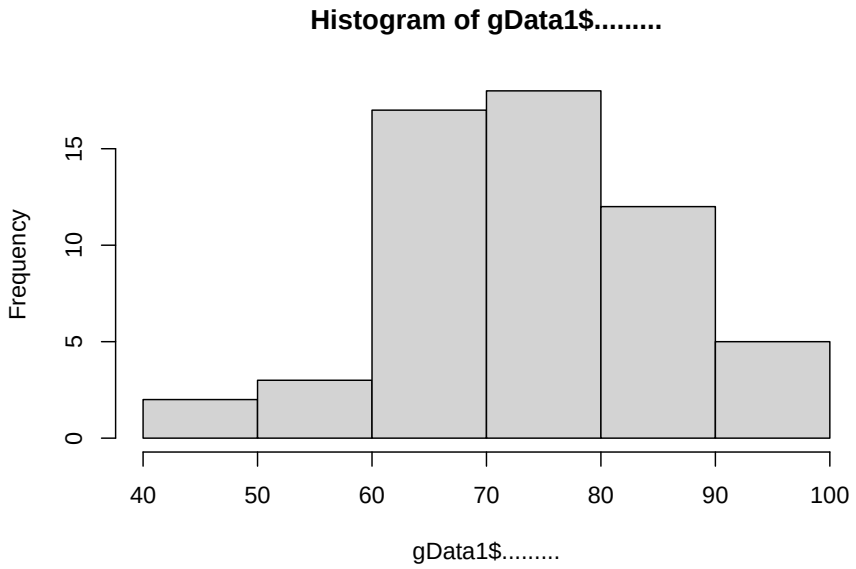

## Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
## conversion failure on 'gData1$  ' in 'mbcsToSbcs': dot substituted for <88>


## Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
## conversion failure on 'gData1$  ' in 'mbcsToSbcs': dot substituted for <90>


## Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
## conversion failure on 'gData1$  ' in 'mbcsToSbcs': dot substituted for <e7>


## Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
## conversion failure on 'gData1$  ' in 'mbcsToSbcs': dot substituted for <b8>


## Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
## conversion failure on 'gData1$  ' in 'mbcsToSbcs': dot substituted for <be>
```



2.3.2

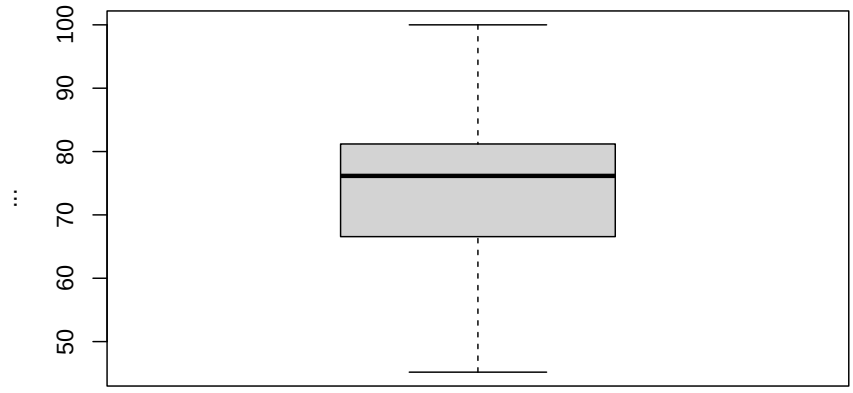
boxplot()

```
boxplot(gData1$  , ylab=" ")
```

```
## Warning in (function (main = NULL, sub = NULL, xlab = NULL, ylab = NULL, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e5>
```

```
## Warning in (function (main = NULL, sub = NULL, xlab = NULL, ylab = NULL, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <88>
```

```
## Warning in (function (main = NULL, sub = NULL, xlab = NULL, ylab = NULL, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <86>
```




```
boxplot(gData1$  ~gData1$ , xlab=" ", ylab=" ")
```

```
## Warning in (function (main = NULL, sub = NULL, xlab = NULL, ylab = NULL, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in (function (main = NULL, sub = NULL, xlab = NULL, ylab = NULL, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in (function (main = NULL, sub = NULL, xlab = NULL, ylab = NULL, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <a7>

## Warning in (function (main = NULL, sub = NULL, xlab = NULL, ylab = NULL, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e5>

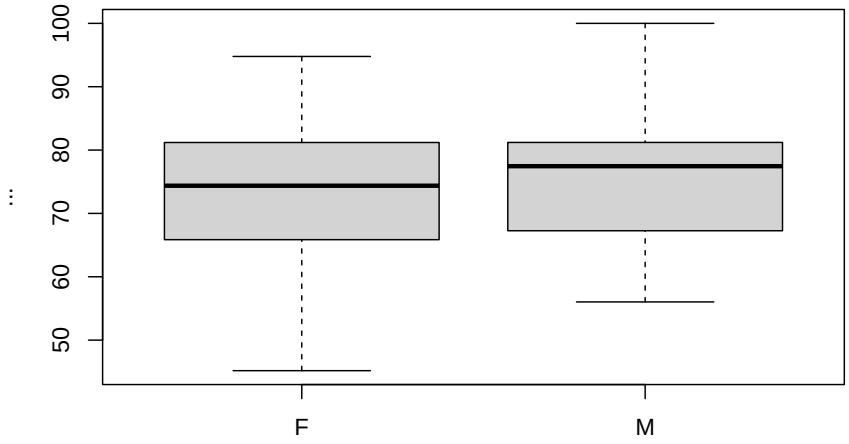
## Warning in (function (main = NULL, sub = NULL, xlab = NULL, ylab = NULL, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <88>

## Warning in (function (main = NULL, sub = NULL, xlab = NULL, ylab = NULL, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <a5>

## Warning in (function (main = NULL, sub = NULL, xlab = NULL, ylab = NULL, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e5>
```

```
## Warning in (function (main = NULL, sub = NULL, xlab = NULL, ylab = NULL, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <88>

## Warning in (function (main = NULL, sub = NULL, xlab = NULL, ylab = NULL, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <86>
```



.....

2.3.3

plot()

```
plot(gData1$ , gData1$  , xlab=" ", ylab="  ")
```

```
## Warning in title(...): conversion failure on ' ' in 'mbcsToSbcs': dot
## substituted for <e5>

## Warning in title(...): conversion failure on ' ' in 'mbcsToSbcs': dot
## substituted for <87>

## Warning in title(...): conversion failure on ' ' in 'mbcsToSbcs': dot
## substituted for <ba>

## Warning in title(...): conversion failure on ' ' in 'mbcsToSbcs': dot
## substituted for <e5>
```

```
## Warning in title(...): conversion failure on ' ' in 'mbcsToSbcs': dot
## substituted for <b8>


## Warning in title(...): conversion failure on ' ' in 'mbcsToSbcs': dot
## substituted for <ad>


## Warning in title(...): conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <e7>


## Warning in title(...): conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <b8>


## Warning in title(...): conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <bd>


## Warning in title(...): conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <e6>

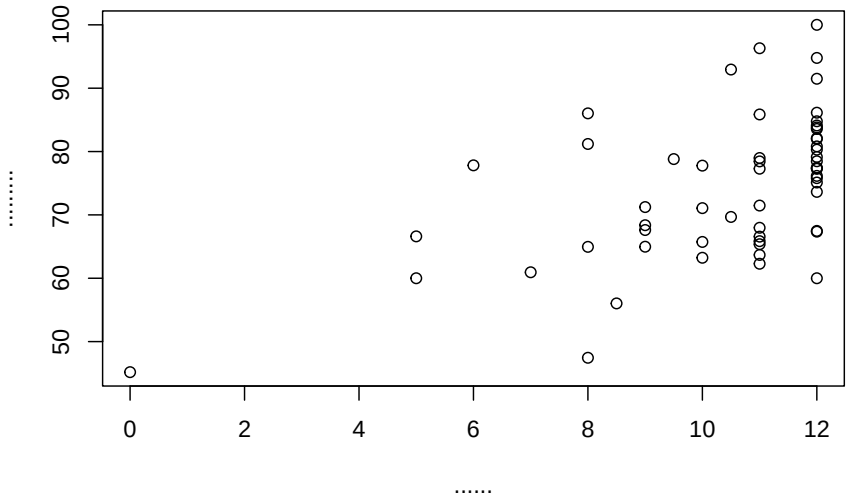

## Warning in title(...): conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <88>


## Warning in title(...): conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <90>


## Warning in title(...): conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <e7>


## Warning in title(...): conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <b8>


## Warning in title(...): conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <be>
```




```
gData2 <- subset(gData1, select = c( ,   ,   ,   ))
plot(gData2)
```

```
## Warning in strwidth(labels, "user"): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <e5>

## Warning in strwidth(labels, "user"): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <87>

## Warning in strwidth(labels, "user"): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <ba>

## Warning in strwidth(labels, "user"): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <e5>

## Warning in strwidth(labels, "user"): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(labels, "user"): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <ad>

## Warning in strwidth(labels, "user"): conversion failure on '  ' in
## 'mbcsToSbcs': dot substituted for <e6>
```

```
## Warning in strwidth(labels, "user"): conversion failure on '  ' in
## 'mbcsToSbcs': dot substituted for <9c>

## Warning in strwidth(labels, "user"): conversion failure on '  ' in
## 'mbcsToSbcs': dot substituted for <9f>

## Warning in strwidth(labels, "user"): conversion failure on '  ' in
## 'mbcsToSbcs': dot substituted for <e4>

## Warning in strwidth(labels, "user"): conversion failure on '  ' in
## 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(labels, "user"): conversion failure on '  ' in
## 'mbcsToSbcs': dot substituted for <ad>

## Warning in strwidth(labels, "user"): conversion failure on '  ' in
## 'mbcsToSbcs': dot substituted for <e8>

## Warning in strwidth(labels, "user"): conversion failure on '  ' in
## 'mbcsToSbcs': dot substituted for <80>

## Warning in strwidth(labels, "user"): conversion failure on '  ' in
## 'mbcsToSbcs': dot substituted for <83>

## Warning in strwidth(labels, "user"): conversion failure on '  ' in
## 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(labels, "user"): conversion failure on '  ' in
## 'mbcsToSbcs': dot substituted for <9c>

## Warning in strwidth(labels, "user"): conversion failure on '  ' in
## 'mbcsToSbcs': dot substituted for <9f>

## Warning in strwidth(labels, "user"): conversion failure on '  ' in
## 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(labels, "user"): conversion failure on '  ' in
## 'mbcsToSbcs': dot substituted for <9c>

## Warning in strwidth(labels, "user"): conversion failure on '  ' in
## 'mbcsToSbcs': dot substituted for <ab>
```

```
## Warning in strwidth(labels, "user"): conversion failure on '  ' in
## 'mbcsToSbcs': dot substituted for <e8>

## Warning in strwidth(labels, "user"): conversion failure on '  ' in
## 'mbcsToSbcs': dot substituted for <80>

## Warning in strwidth(labels, "user"): conversion failure on '  ' in
## 'mbcsToSbcs': dot substituted for <83>

## Warning in strwidth(labels, "user"): conversion failure on '  ' in
## 'mbcsToSbcs': dot substituted for <e7>

## Warning in strwidth(labels, "user"): conversion failure on '  ' in
## 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(labels, "user"): conversion failure on '  ' in
## 'mbcsToSbcs': dot substituted for <bd>

## Warning in strwidth(labels, "user"): conversion failure on '  ' in
## 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(labels, "user"): conversion failure on '  ' in
## 'mbcsToSbcs': dot substituted for <88>

## Warning in strwidth(labels, "user"): conversion failure on '  ' in
## 'mbcsToSbcs': dot substituted for <90>

## Warning in strwidth(labels, "user"): conversion failure on '  ' in
## 'mbcsToSbcs': dot substituted for <e7>

## Warning in strwidth(labels, "user"): conversion failure on '  ' in
## 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(labels, "user"): conversion failure on '  ' in
## 'mbcsToSbcs': dot substituted for <be>

## Warning in text.default(x, y, txt, cex = cex, font = font): conversion failure
## on ' ' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in text.default(x, y, txt, cex = cex, font = font): conversion failure
## on ' ' in 'mbcsToSbcs': dot substituted for <87>
```

```
## Warning in text.default(x, y, txt, cex = cex, font = font): conversion failure
## on ' ' in 'mbcsToSbcs': dot substituted for <ba>

## Warning in text.default(x, y, txt, cex = cex, font = font): conversion failure
## on ' ' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in text.default(x, y, txt, cex = cex, font = font): conversion failure
## on ' ' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in text.default(x, y, txt, cex = cex, font = font): conversion failure
## on ' ' in 'mbcsToSbcs': dot substituted for <ad>

## Warning in text.default(x, y, txt, cex = cex, font = font): font metrics unknown
## for Unicode character U+51fa

## Warning in text.default(x, y, txt, cex = cex, font = font): font metrics unknown
## for Unicode character U+5e2d

## Warning in text.default(x, y, txt, cex = cex, font = font): conversion failure
## on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in text.default(x, y, txt, cex = cex, font = font): conversion failure
## on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in text.default(x, y, txt, cex = cex, font = font): conversion failure
## on '  ' in 'mbcsToSbcs': dot substituted for <9f>

## Warning in text.default(x, y, txt, cex = cex, font = font): conversion failure
## on '  ' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in text.default(x, y, txt, cex = cex, font = font): conversion failure
## on '  ' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in text.default(x, y, txt, cex = cex, font = font): conversion failure
## on '  ' in 'mbcsToSbcs': dot substituted for <ad>

## Warning in text.default(x, y, txt, cex = cex, font = font): conversion failure
## on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in text.default(x, y, txt, cex = cex, font = font): conversion failure
## on '  ' in 'mbcsToSbcs': dot substituted for <80>
```

```
## Warning in text.default(x, y, txt, cex = cex, font = font): conversion failure
## on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in text.default(x, y, txt, cex = cex, font = font): font metrics unknown
## for Unicode character U+671f

## Warning in text.default(x, y, txt, cex = cex, font = font): font metrics unknown
## for Unicode character U+4e2d

## Warning in text.default(x, y, txt, cex = cex, font = font): font metrics unknown
## for Unicode character U+8003

## Warning in text.default(x, y, txt, cex = cex, font = font): conversion failure
## on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in text.default(x, y, txt, cex = cex, font = font): conversion failure
## on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in text.default(x, y, txt, cex = cex, font = font): conversion failure
## on '  ' in 'mbcsToSbcs': dot substituted for <9f>

## Warning in text.default(x, y, txt, cex = cex, font = font): conversion failure
## on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in text.default(x, y, txt, cex = cex, font = font): conversion failure
## on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in text.default(x, y, txt, cex = cex, font = font): conversion failure
## on '  ' in 'mbcsToSbcs': dot substituted for <ab>

## Warning in text.default(x, y, txt, cex = cex, font = font): conversion failure
## on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in text.default(x, y, txt, cex = cex, font = font): conversion failure
## on '  ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in text.default(x, y, txt, cex = cex, font = font): conversion failure
## on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in text.default(x, y, txt, cex = cex, font = font): font metrics unknown
## for Unicode character U+671f
```

```
## Warning in text.default(x, y, txt, cex = cex, font = font): font metrics unknown
## for Unicode character U+672b

## Warning in text.default(x, y, txt, cex = cex, font = font): font metrics unknown
## for Unicode character U+8003

## Warning in text.default(x, y, txt, cex = cex, font = font): conversion failure
## on '  ' in 'mbcsToSbcs': dot substituted for <e7>

## Warning in text.default(x, y, txt, cex = cex, font = font): conversion failure
## on '  ' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in text.default(x, y, txt, cex = cex, font = font): conversion failure
## on '  ' in 'mbcsToSbcs': dot substituted for <bd>

## Warning in text.default(x, y, txt, cex = cex, font = font): conversion failure
## on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in text.default(x, y, txt, cex = cex, font = font): conversion failure
## on '  ' in 'mbcsToSbcs': dot substituted for <88>

## Warning in text.default(x, y, txt, cex = cex, font = font): conversion failure
## on '  ' in 'mbcsToSbcs': dot substituted for <90>

## Warning in text.default(x, y, txt, cex = cex, font = font): conversion failure
## on '  ' in 'mbcsToSbcs': dot substituted for <e7>

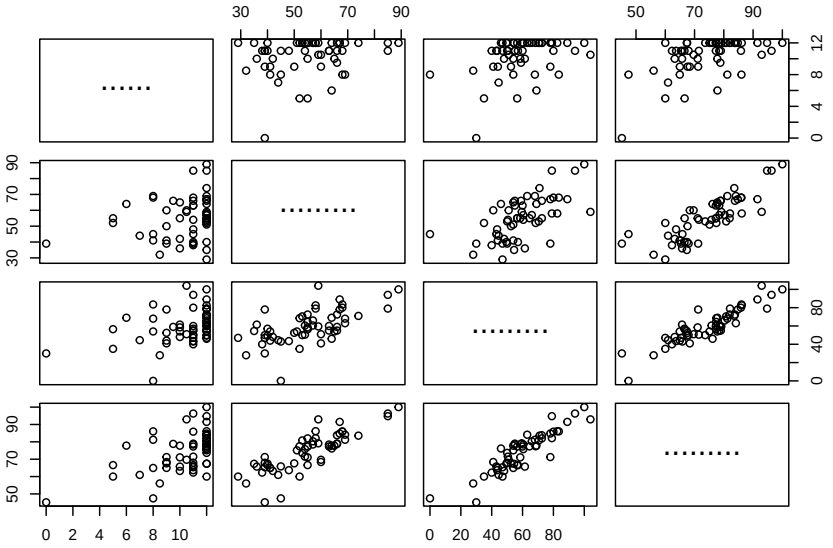
## Warning in text.default(x, y, txt, cex = cex, font = font): conversion failure
## on '  ' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in text.default(x, y, txt, cex = cex, font = font): conversion failure
## on '  ' in 'mbcsToSbcs': dot substituted for <be>

## Warning in text.default(x, y, txt, cex = cex, font = font): font metrics unknown
## for Unicode character U+7e3d

## Warning in text.default(x, y, txt, cex = cex, font = font): font metrics unknown
## for Unicode character U+6210

## Warning in text.default(x, y, txt, cex = cex, font = font): font metrics unknown
## for Unicode character U+7e3e
```



2.3.4

2.3.4.1

cor() cor.test()

```
cor(gData1$ , gData1$  )
```

```
## [1] 0.5360227
```

```
cor.test(gData1$ , gData1$  )
```

```
##
##  Pearson's product-moment correlation
##
## data:  gData1$  and gData1$
## t = 4.7089, df = 55, p-value = 1.73e-05
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
##  0.3201738 0.6989657
## sample estimates:
##       cor
## 0.5360227
```

cor() Hmisc() rcorr()

```
cor(gData2)
```

```
##
##     1.0000000 0.2220785 0.3760520 0.5360227
##    0.2220785 1.0000000 0.6211838 0.8319727
##    0.3760520 0.6211838 1.0000000 0.8983073
##    0.5360227 0.8319727 0.8983073 1.0000000
```

```
library(Hmisc)
rcorr(data.matrix(gData2))
```

```
##
##     1.00   0.22   0.38   0.54
##    0.22   1.00   0.62   0.83
##    0.38   0.62   1.00   0.90
##    0.54   0.83   0.90   1.00
##
## n= 57
##
##
## P
##
##             0.0969 0.0039 0.0000
##    0.0969         0.0000 0.0000
##    0.0039 0.0000         0.0000
##    0.0000 0.0000 0.0000
```

2.3.4.2

corrplot corrplot()

```
library(corrplot)
corrplot(cor(gData2), method='number',type = "upper")
```

```
## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <e5>
```

```
## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <87>
```

```
## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <ba>
```

```
## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <e5>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <ad>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9c>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9f>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e4>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <ad>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e8>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <80>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <83>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9c>
```

```
## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9f>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9c>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <ab>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e8>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <80>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <83>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e7>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <bd>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <88>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <90>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e7>
```

```
## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <be>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <e5>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <87>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <ba>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <e5>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <ad>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9c>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9f>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e4>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <ad>
```

```
## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <80>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <83>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9c>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9f>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9c>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <ab>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <80>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <83>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e7>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>
```

```
## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <bd>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <88>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <90>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e7>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <be>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <e5>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <87>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <ba>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <e5>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <ad>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>
```

```
## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9c>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9f>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e4>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <ad>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
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## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
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## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
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## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
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## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9c>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <ab>
```

```
## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e8>

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## in 'mbcsToSbcs': dot substituted for <e7>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <bd>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <88>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <90>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e7>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <be>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <e5>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <87>
```

```
## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <ba>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <e5>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <ad>

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## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e4>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
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## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
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## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
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## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
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## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <83>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>
```

```
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## in 'mbcsToSbcs': dot substituted for <9c>

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## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
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## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e8>

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## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
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## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <88>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <90>
```

```
## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e7>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

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## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <e5>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <87>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <ba>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <e5>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <b8>

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## 'mbcsToSbcs': dot substituted for <ad>

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## in 'mbcsToSbcs': dot substituted for <9f>

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## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>
```

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## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <ad>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
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## in 'mbcsToSbcs': dot substituted for <e7>
```

```
## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
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## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

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## in 'mbcsToSbcs': dot substituted for <88>

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## in 'mbcsToSbcs': dot substituted for <90>

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## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <be>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <e5>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <87>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <ba>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
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## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <ad>
```

```
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## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9c>

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## in 'mbcsToSbcs': dot substituted for <9f>

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## in 'mbcsToSbcs': dot substituted for <e4>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
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## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <ad>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
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## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
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## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
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## in 'mbcsToSbcs': dot substituted for <9c>
```

```
## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
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## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
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## in 'mbcsToSbcs': dot substituted for <be>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <e5>
```

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## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <87>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <ba>

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## 'mbcsToSbcs': dot substituted for <e5>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <ad>

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## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <83>
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## in 'mbcsToSbcs': dot substituted for <88>
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## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
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## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e7>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <be>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <e5>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <87>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <ba>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <e5>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <ad>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9c>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9f>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e4>
```

```
## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <ad>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <80>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <83>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9c>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9f>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9c>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <ab>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <80>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <83>
```

```
## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e7>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <bd>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <88>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <90>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e7>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <be>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <e5>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <87>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <ba>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <e5>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <b8>
```

```
## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <ad>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9c>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9f>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e4>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <ad>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e8>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <80>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <83>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9c>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9f>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>
```

```
## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9c>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <ab>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e8>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <80>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <83>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e7>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <bd>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <88>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <90>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e7>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <be>
```

```
## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <e5>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <87>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <ba>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <e5>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <ad>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9c>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9f>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e4>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <ad>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <80>
```

```
## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <83>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9c>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9f>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9c>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <ab>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <80>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <83>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e7>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <bd>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>
```

```
## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <88>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <90>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e7>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <be>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <87>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <ba>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <ad>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : font metrics unknown for Unicode character U+51fa

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : font metrics unknown for Unicode character U+5e2d

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <e6>
```

```
## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <9c>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <9f>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <e4>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <b8>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <ad>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <e8>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <80>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <83>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : font metrics unknown for Unicode character U+671f

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : font metrics unknown for Unicode character U+4e2d

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : font metrics unknown for Unicode character U+8003

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <e6>
```

```
## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <9c>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <9f>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <e6>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <9c>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <ab>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <e8>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <80>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <83>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : font metrics unknown for Unicode character U+671f

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : font metrics unknown for Unicode character U+672b

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : font metrics unknown for Unicode character U+8003

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <e7>
```

```
## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <b8>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <bd>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <e6>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <88>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <90>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <e7>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <b8>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <be>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : font metrics unknown for Unicode character U+7e3d

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : font metrics unknown for Unicode character U+6210

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : font metrics unknown for Unicode character U+7e3e

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e5>
```

```
## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <87>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <ba>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <ad>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <e6>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <9c>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <9f>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <e4>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <b8>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <ad>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <e8>
```

```
## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <80>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <83>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <e6>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <9c>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <9f>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <e6>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <9c>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <ab>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <e8>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <80>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <83>
```

```
## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <e7>


## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <b8>


## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <bd>


## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <e6>

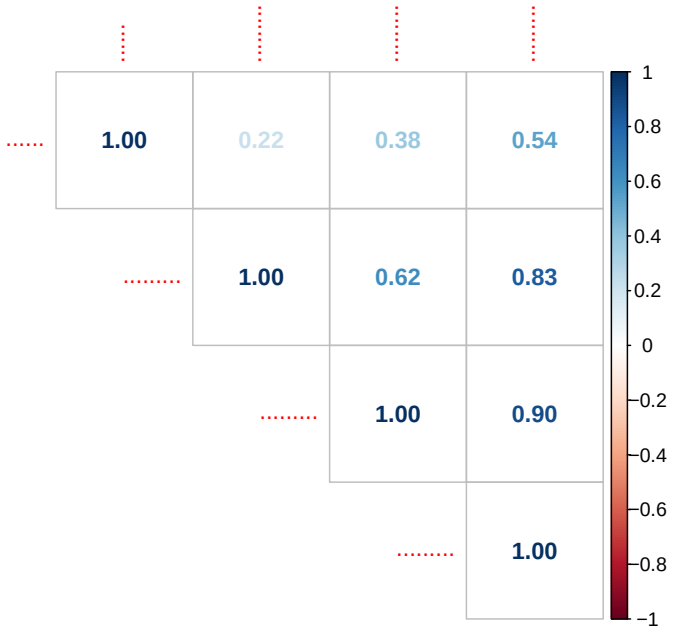

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <88>


## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <90>


## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <e7>


## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <b8>


## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <be>
```




```
corrplot(cor(gData2), method='color', type="upper")
```

```
## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <e5>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <87>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <ba>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <e5>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <ad>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>
```

```
## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9c>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9f>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e4>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <ad>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e8>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <80>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <83>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9c>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9f>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9c>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <ab>
```

```
## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e8>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <80>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <83>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e7>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <bd>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <88>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <90>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e7>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <be>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <e5>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <87>
```

```
## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <ba>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <e5>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <ad>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9c>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9f>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e4>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <ad>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <80>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <83>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>
```

```
## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9c>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9f>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9c>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <ab>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <80>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <83>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e7>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <bd>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <88>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <90>
```

```
## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e7>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <be>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <e5>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <87>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <ba>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <e5>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <ad>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9c>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9f>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e4>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>
```

```
## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <ad>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e8>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <80>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <83>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9c>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9f>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9c>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <ab>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e8>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <80>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <83>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e7>
```

```
## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <bd>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <88>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <90>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e7>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <be>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <e5>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <87>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <ba>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <e5>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <ad>
```

```
## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9c>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9f>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e4>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <ad>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <80>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <83>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9c>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9f>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9c>
```

```
## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <ab>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <80>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <83>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
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## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <bd>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <88>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <90>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e7>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <be>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <e5>
```

```
## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <87>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <ba>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <e5>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <ad>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9c>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9f>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e4>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <ad>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e8>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <80>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <83>
```

```
## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9c>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9f>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
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## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <ab>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e8>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <80>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
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## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
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## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <bd>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <88>
```

```
## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <90>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e7>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <be>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <e5>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <87>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <ba>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <e5>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <ad>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9c>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9f>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e4>
```

```
## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <ad>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <80>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <83>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9c>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9f>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9c>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <ab>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <80>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <83>
```

```
## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e7>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <bd>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <88>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <90>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e7>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <be>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <e5>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <87>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <ba>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <e5>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <b8>
```

```
## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <ad>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9c>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9f>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e4>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <ad>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e8>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <80>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <83>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9c>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9f>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>
```

```
## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9c>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <ab>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e8>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <80>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <83>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e7>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <bd>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <88>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <90>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e7>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <be>
```

```
## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <e5>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <87>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <ba>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <e5>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <ad>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9c>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9f>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e4>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <ad>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <80>
```

```
## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <83>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9c>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9f>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9c>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <ab>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <80>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <83>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e7>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <bd>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>
```

```
## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <88>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <90>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e7>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <be>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <e5>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <87>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <ba>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <e5>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <ad>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9c>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9f>
```

```
## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e4>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <ad>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e8>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <80>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <83>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9c>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9f>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9c>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <ab>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e8>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <80>
```

```
## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <83>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e7>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <bd>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <88>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <90>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e7>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newrownames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <be>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <e5>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <87>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <ba>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <e5>
```

```
## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on ' ' in
## 'mbcsToSbcs': dot substituted for <ad>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9c>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9f>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e4>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <ad>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <80>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <83>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9c>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9f>
```

```
## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <9c>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <ab>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <80>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
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## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
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## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <bd>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e6>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <88>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <90>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <e7>

## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <b8>
```

```
## Warning in strwidth(newcolnames, cex = tl.cex): conversion failure on '  '
## in 'mbcsToSbcs': dot substituted for <be>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <87>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <ba>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <ad>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : font metrics unknown for Unicode character U+51fa

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : font metrics unknown for Unicode character U+5e2d

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <e6>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <9c>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <9f>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <e4>
```

```
## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <b8>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <ad>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <e8>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <80>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <83>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : font metrics unknown for Unicode character U+671f

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : font metrics unknown for Unicode character U+4e2d

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : font metrics unknown for Unicode character U+8003

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <e6>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <9c>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <9f>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <e6>
```

```
## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <9c>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <ab>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <e8>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <80>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <83>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : font metrics unknown for Unicode character U+671f

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : font metrics unknown for Unicode character U+672b

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : font metrics unknown for Unicode character U+8003

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <e7>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <b8>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <bd>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <e6>
```

```
## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <88>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <90>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <e7>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <b8>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <be>

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : font metrics unknown for Unicode character U+7e3d

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : font metrics unknown for Unicode character U+6210

## Warning in text.default(pos.xlabel[, 1], pos.xlabel[, 2], newcolnames, srt =
## tl.srt, : font metrics unknown for Unicode character U+7e3e

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <87>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <ba>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <b8>
```

```
## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <ad>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <e6>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <9c>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <9f>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <e4>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <b8>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <ad>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <e8>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <80>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <83>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <e6>
```

```
## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <9c>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <9f>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <e6>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <9c>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <ab>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <e8>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <80>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <83>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <e7>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <b8>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <bd>
```

```
## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <e6>

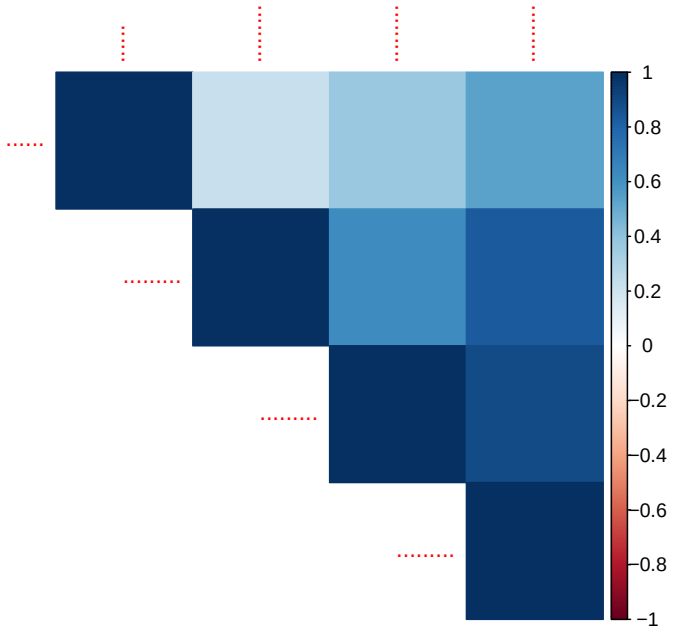
## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <88>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <90>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <e7>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <b8>

## Warning in text.default(pos.ylabel[, 1], pos.ylabel[, 2], newrownames, col =
## tl.col, : conversion failure on '  ' in 'mbcsToSbcs': dot substituted for
## <be>
```



Chapter 3

R t

3.1

xlsx read.xlsx() readxl read_xlsx() gData1.xlsx

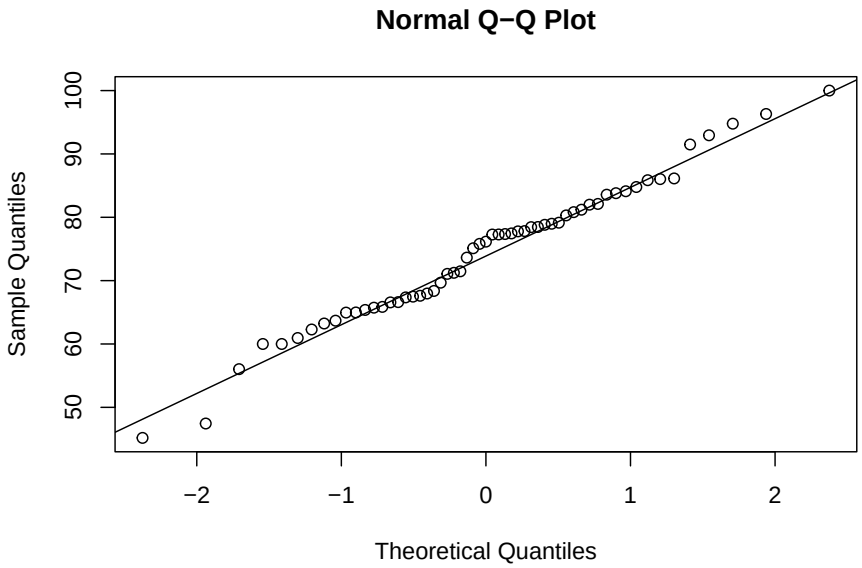
```
library(readxl)
gData1 <- read_xlsx("gData1.xlsx")
head(gData1)
```

```
## # A tibble: 6 x 8
##
##   <chr>     <chr> <dbl> <dbl> <dbl>  <dbl>  <dbl>  <dbl>
## 1 102368014 M         9   8.5  82.6     32   28     56.0
## 2 102368018 M        10   9.5  82.9     66   59     78.8
## 3 102368024 F         9   8    82.6     69   68     81.2
## 4 102368027 F         9   8    82.6     68   83.5   86.0
## 5 102368030 F        11   0    66.5     39   30     45.2
## 6 100368033 M         4  12    73.3     58   79     82.1
```

3.2

qqnorm() qqline() Q-Q

```
qqnorm(gData1$ )
qqline(gData1$ )
```



shapiro.test()

```
shapiro.test(gData1$ )
```

```
##
##  Shapiro-Wilk normality test
##
## data:  gData1$
## W = 0.98346, p-value = 0.6243
```

3.3 t

factor

```
gData1$  <- factor(gData1$ )
```

leveneTest()

```
library(car)
leveneTest(gData1$   ~ gData1$ , center="mean")
```

```
## Levene's Test for Homogeneity of Variance (center = "mean")
##       Df F value Pr(>F)
## group  1  0.2112 0.6476
##       55
```

t

```
t.test(gData1$   ~ gData1$ , var.equal=TRUE)
```

```
##
##  Two Sample t-test
##
## data:  gData1$   by gData1$
## t = -0.62999, df = 55, p-value = 0.5313
## alternative hypothesis: true difference in means between group F and group M is not equal to 0
## 95 percent confidence interval:
##  -7.892010  4.116907
## sample estimates:
## mean in group F mean in group M
##        73.43611        75.32366
```

3.4 t

t.test() t

```
t.test(gData1$  , gData1$  , pair=TRUE)
```

```
##
##  Paired t-test
##
## data:  gData1$   and gData1$
## t = -2.3616, df = 56, p-value = 0.0217
## alternative hypothesis: true mean difference is not equal to 0
## 95 percent confidence interval:
##  -8.3334024 -0.6841415
## sample estimates:
## mean difference
##       -4.508772
```

t.test() alternative ”greater” “less”

```
t.test(gData1$  , gData1$  , alternative='less',  pair=TRUE)
```

```
##
##  Paired t-test
##
## data:  gData1$   and gData1$
## t = -2.3616, df = 56, p-value = 0.01085
## alternative hypothesis: true mean difference is less than 0
## 95 percent confidence interval:
##       -Inf -1.315556
## sample estimates:
## mean difference
##       -4.508772
```

Chapter 4

R

4.1

4.1.1

xlsx read.xlsx() readxl read_xlsx() gData1.xlsx

```
library(readxl)
gData1 <- read_xlsx("gData1.xlsx")
head(gData1)
```

```
## # A tibble: 6 x 8
##
##   <chr>     <chr> <dbl> <dbl> <dbl>  <dbl>  <dbl>  <dbl>
## 1 102368014 M         9   8.5  82.6     32   28     56.0
## 2 102368018 M        10   9.5  82.9     66   59     78.8
## 3 102368024 F         9   8    82.6     69   68     81.2
## 4 102368027 F         9   8    82.6     68   83.5   86.0
## 5 102368030 F        11   0    66.5     39   30     45.2
## 6 100368033 M         4  12    73.3     58   79     82.1
```

4.1.2

```
library(tibble)
gData1 <- add_column(gData1,   =gData1$ *8, .after = 5)
head(gData1)
```

```
## # A tibble: 6 x 9
##
##   <chr>     <chr> <dbl> <dbl> <dbl>  <dbl>  <dbl>  <dbl>  <dbl>
## 1 102368014 M         9   8.5  82.6     68     32   28     56.0
## 2 102368018 M        10   9.5  82.9     76     66   59     78.8
## 3 102368024 F         9   8    82.6     64     69   68     81.2
## 4 102368027 F         9   8    82.6     64     68   83.5   86.0
## 5 102368030 F        11   0    66.5      0     39   30     45.2
## 6 100368033 M         4  12    73.3     96     58   79     82.1
```

```
gData3 <- subset(gData1, select = c(  ,   ,   ))
gData3 <- add_column(gData3, id = c(1:nrow(gData3)), .after = 0)
head(gData3)
```

```
## # A tibble: 6 x 4
##      id
##   <int>  <dbl>  <dbl>  <dbl>
## 1     1     68     32   28
## 2     2     76     66   59
## 3     3     64     69   68
## 4     4     64     68   83.5
## 5     5      0     39   30
## 6     6     96     58   79
```

reshape2 melt()

```
library(reshape2)
gData3m <- melt(gData3, id = c("id"), measured = c("  ", "  ", "  "))
head(gData3m)
```

```
##   id variable value
## 1  1         68
## 2  2         76
## 3  3         64
## 4  4         64
## 5  5          0
## 6  6         96
```

Table 4.1: Summary Statistics

Variable	N	Mean	SD	N	Mean	SD	N	Mean	SD
	57	29	16.598	57	29	16.598	57	29	16.598
	57	82.807	18.485	57	54.947	13.313	57	59.456	18.216

column

```
names(gData3m) <- c(' ', ' ', ' ')
head(gData3m)
```

```
##
## 1    1      68
## 2    2      76
## 3    3      64
## 4    4      64
## 5    5       0
## 6    6      96
```

columns wide data - long data

4.2

```
library(vtable)
st(gData3m, group=' ')
```

boxplot

```
boxplot( ~ , data=gData3m)
```

```
## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <e6>
```

```
## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <9c>

## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <9f>

## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <e5>

## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <88>

## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <9d>

## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <e8>

## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <80>

## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <83>

## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <e6>

## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <9c>

## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <9f>
```

```
## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <e5>

## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <88>

## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <9d>

## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <e8>

## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <80>

## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <83>

## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <e6>

## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <9c>

## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <9f>

## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <e4>

## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <b8>
```

```
## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <ad>

## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
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## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
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## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <83>

## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <e6>

## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <9c>

## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <9f>

## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <e4>

## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <b8>

## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <ad>

## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <e8>
```

```
## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <80>

## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <83>

## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <e6>

## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <9c>

## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <9f>

## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <e6>

## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <9c>

## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <ab>

## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <e8>

## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <80>

## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <83>
```

```
## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <e6>

## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <9c>

## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <9f>

## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <e6>

## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <9c>

## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <ab>

## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <e8>

## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <80>

## Warning in axis(side = base::quote(1), at = base::quote(1:3), labels =
## base::quote(c("  ", : conversion failure on '  ' in 'mbcsToSbcs': dot
## substituted for <83>

## Warning in (function (main = NULL, sub = NULL, xlab = NULL, ylab = NULL, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in (function (main = NULL, sub = NULL, xlab = NULL, ylab = NULL, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in (function (main = NULL, sub = NULL, xlab = NULL, ylab = NULL, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <83>
```

```
## Warning in (function (main = NULL, sub = NULL, xlab = NULL, ylab = NULL, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in (function (main = NULL, sub = NULL, xlab = NULL, ylab = NULL, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <a9>

## Warning in (function (main = NULL, sub = NULL, xlab = NULL, ylab = NULL, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <a6>

## Warning in (function (main = NULL, sub = NULL, xlab = NULL, ylab = NULL, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e6>

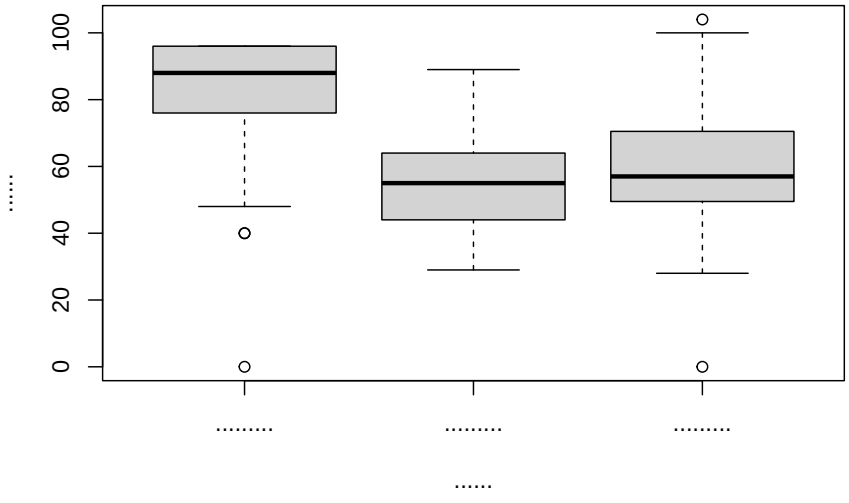
## Warning in (function (main = NULL, sub = NULL, xlab = NULL, ylab = NULL, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <88>

## Warning in (function (main = NULL, sub = NULL, xlab = NULL, ylab = NULL, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <90>

## Warning in (function (main = NULL, sub = NULL, xlab = NULL, ylab = NULL, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e7>

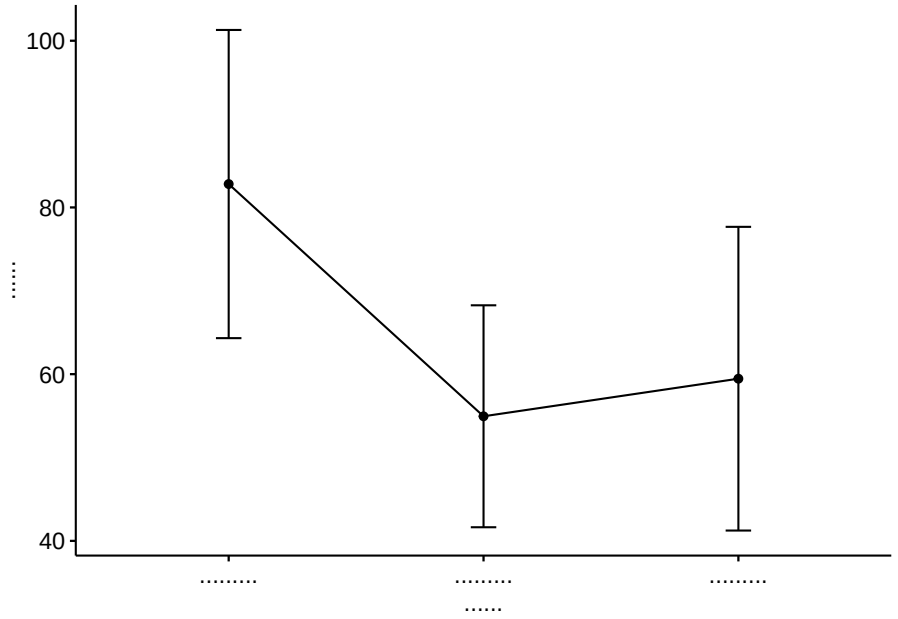
## Warning in (function (main = NULL, sub = NULL, xlab = NULL, ylab = NULL, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in (function (main = NULL, sub = NULL, xlab = NULL, ylab = NULL, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <be>
```



ggpubr ggline

```
library(ggpubr)
ggline(gData3m,x=" ",y=" ",add=c("mean_sd"))
```



4.3

factor

```
gData3m$  <- factor(gData3m$ )
head(gData3m)
```

```
##
## 1    1      68
## 2    2      76
## 3    3      64
## 4    4      64
## 5    5       0
## 6    6      96
```

4.3.1

rstatix package anova_test() res res

sphericity correction Sphericity Corrections Greenhouse-Geisser (GG) Huynh-Feldt (HF) epsilon values p[GG] p[HF] .001

```
library(rstatix)
res <- anova_test(data = gData3m, dv =  , wid =  , within =  )
res
```

```
## ANOVA Table (type III tests)
##
## $ANOVA
##   Effect DFn DFd      F        p p<.05   ges
## 1       2 112 73.704 3.74e-21     * 0.349
##
## $`Mauchly's Test for Sphericity`
##   Effect    W     p p<.05
## 1     0.84 0.008     *
##
## $`Sphericity Corrections`
##   Effect   GGe      DF[GG]   p[GG] p[GG]<.05   HFe      DF[HF]   p[HF]
## 1     0.862 1.72, 96.57 1.4e-18         * 0.887 1.77, 99.36 4.8e-19
##   p[HF]<.05
## 1         *
```

get_anova_table() $F(1.72, 96.57) = 73.704$, $p < .001$

```
get_anova_table(res)
```

```
## ANOVA Table (type III tests)
##
##   Effect  DFn   DFd      F       p p<.05   ges
## 1     1.72 96.57 73.704 1.4e-18     * 0.349
```

4.3.2

pairwise_t_test()

```
pairwise_t_test(gData3m,   ~  , paired = TRUE, p.adjust.method = "bonferroni")
```

```
## # A tibble: 3 x 10
##   .y.   group1 group2    n1    n2 statistic    df        p    p.adj p.adj.signif
## * <chr> <chr>  <chr>  <int> <int>     <dbl> <dbl>    <dbl>    <dbl> <chr>
## 1             57    57     10.4     56 1.11e-14 3.33e-14 ****
## 2             57    57      8.60    56 8.06e-12 2.42e-11 ****
## 3             57    57     -2.36    56 2.2 e- 2 6.5 e- 2 ns
```

4.3.3

aov() aov() y~factor(x)+Error(factor(Subj)/factor(x))

```
ANOVAData <- aov( ~factor( )+Error(factor( )/factor( )), data=gData3m)
```

model.tables() (marginal mean) (ground mean) 65.74 82.81 54.95 59.46

```
model.tables(ANOVAData,type="means")
```

```
## Tables of means
## Grand mean
##
## 65.73684
##
##  factor( )
## factor( )
##
##  82.81  54.95  59.46
```

summary() ANOVA table F(2,112)=73.7 p<.001

```
summary(ANOVAData,type="means")
```

```
##
## Error: factor( )
##           Df Sum Sq Mean Sq F value Pr(>F)
## Residuals 56  28272   504.9
##
## Error: factor( ):factor( )
##               Df Sum Sq Mean Sq F value Pr(>F)
## factor( )   2  25493   12747    73.7 <2e-16 ***
## Residuals    112  19370     173
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Chapter 5

R

5.1

5.1.1

gData3m xlsx read.xlsx() readxl read_xlsx() gData3m.xlsx

```
library(readxl)
gData3m <- read_xlsx("gData3m.xlsx")
head(gData3m)
```

```
## # A tibble: 6 x 3
##
##   <chr> <chr>  <dbl>
## 1 1           68
## 2 2           76
## 3 3           64
## 4 4           64
## 5 5            0
## 6 6           96
```

5.1.2

```
cData <- gData3m
names(cData)[2] <- ' '
```

A B C 1~171 171

```
library(plyr)
```

```
##
## Attaching package: 'plyr'
```

```
## The following objects are masked from 'package:rstatix':
##
##     desc, mutate
```

```
## The following object is masked from 'package:ggpubr':
##
##     mutate
```

```
## The following objects are masked from 'package:Hmisc':
##
##     is.discrete, summarize
```

```
cData$  <- revalue(cData$ , c("  "="A", "  "="B", "  "="C"))
cData$  <- c(1:171)
head(cData)
```

```
## # A tibble: 6 x 3
##
##   <int> <chr> <dbl>
## 1     1 A        68
## 2     2 A        76
## 3     3 A        64
## 4     4 A        64
## 5     5 A         0
## 6     6 A        96
```

5.2

5.3

factor factor

```
cData$  <- factor(cData$ )
str(cData)
```

```
## tibble [171 x 3] (S3: tbl_df/tbl/data.frame)
##  $  : int [1:171] 1 2 3 4 5 6 7 8 9 10 ...
##  $  : Factor w/ 3 levels "A","B","C": 1 1 1 1 1 1 1 1 1 1 ...
##  $  : num [1:171] 68 76 64 64 0 96 96 40 96 96 ...
```

5.3.1

leveneTest() F(2,168)=1.46, p=0.23

```
library(car)
leveneTest( ~ , data=cData, center=mean)
```

```
## Levene's Test for Homogeneity of Variance (center = mean)
##        Df F value Pr(>F)
## group   2  1.4619 0.2347
##       168
```

5.3.2

anova() F(2,168)=44.95, p<.001

```
anova(lm(  ~  , data = cData))
```

```
## Analysis of Variance Table
##
## Response:
##            Df Sum Sq Mean Sq F value    Pr(>F)
##          2  25493 12746.6  44.949 2.314e-16 ***
## Residuals 168  47642   283.6
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

aov()

```
anova1 <- aov( ~factor( ),data=cData)
model.tables(anova1, type="means")
```

```
## Tables of means
## Grand mean
##
## 65.73684
##
##  factor( )
## factor( )
##     A     B     C
## 82.81 54.95 59.46
```

```
summary(anova1)
```

```
##               Df Sum Sq Mean Sq F value   Pr(>F)
## factor( )   2  25493   12747   44.95 2.31e-16 ***
## Residuals    168  47642     284
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

5.3.3

TukeyHSD() A B A C B C

```
TukeyHSD(anova1)
```

```
##   Tukey multiple comparisons of means
##     95% family-wise confidence level
##
## Fit: aov(formula =   ~ factor( ), data = cData)
##
## $`factor( )`
##           diff        lwr       upr     p adj
## B-A -27.859649 -35.318779 -20.40052 0.0000000
## C-A -23.350877 -30.810007 -15.89175 0.0000000
## C-B   4.508772  -2.950358  11.96790 0.3281624
```

pairwise t test

```
library(rstatix)
pairwise_t_test(cData,  ~ , paired = FALSE, p.adjust.method = "bonferroni")
```

```
## # A tibble: 3 x 9
##   .y.   group1 group2    n1    n2        p p.signif    p.adj p.adj.signif
## * <chr> <chr>  <chr>  <int> <int>    <dbl> <chr>       <dbl> <chr>
## 1    A      B          57    57 1.32e-15 ****     3.95e-15 ****
## 2    A      C          57    57 6.12e-12 ****     1.84e-11 ****
## 3    B      C          57    57 1.55e- 1 ns       4.64e- 1 ns
```

5.3.4

oneway.test() var.equal FALSE ANOVA

```
oneway.test( ~ , data=cData, var.equal=FALSE)
```

```
##
##  One-way analysis of means (not assuming equal variances)
##
## data:    and
## F = 43.952, num df = 2.00, denom df = 109.09, p-value = 1e-14
```

games_howell_test games_howell_test()

```
library(rstatix)
games_howell_test(cData,   ~  , conf.level = 0.95, detailed = FALSE)
```

```
## # A tibble: 3 x 8
##   .y.   group1 group2 estimate conf.low conf.high    p.adj p.adj.signif
## * <chr> <chr>  <chr>     <dbl>    <dbl>     <dbl>    <dbl> <chr>
## 1    A      B        -27.9    -35.0      -20.7 4.72e-14 ****
## 2    A      C        -23.4    -31.5      -15.2 1.66e- 9 ****
## 3    B      C          4.51    -2.60      11.6 2.91e- 1 ns
```

Chapter 6

R

6.1

6.1.1

xlsx read.xlsx() readxl read_xlsx() gData1.xlsx

```
library(readxl)
gData1 <- read_xlsx("gData1.xlsx")
gData1 <- as.data.frame(gData1)
head(gData1)
```

```
##
## 1 102368014    M    9  8.5 82.58333     32   28.0 56.02778
## 2 102368018    M   10  9.5 82.93333     66   59.0 78.81111
## 3 102368024    F    9  8.0 82.58333     69   68.0 81.19444
## 4 102368027    F    9  8.0 82.58333     68   83.5 86.02778
## 5 102368030    F   11  0.0 66.53333     39   30.0 45.17778
## 6 100368033    M    4 12.0 73.33333     58   79.0 82.11111
```

6.1.2

```
library(tibble)
gData1 <- add_column(gData1,   =gData1$ *8, .after = 5)
head(gData1)
```

```
##
## 1 102368014    M    9  8.5 82.58333     68     32   28.0 56.02778
## 2 102368018    M   10  9.5 82.93333     76     66   59.0 78.81111
## 3 102368024    F    9  8.0 82.58333     64     69   68.0 81.19444
## 4 102368027    F    9  8.0 82.58333     64     68   83.5 86.02778
## 5 102368030    F   11  0.0 66.53333      0     39   30.0 45.17778
## 6 100368033    M    4 12.0 73.33333     96     58   79.0 82.11111
```

```
gData2 <- add_column(gData1,    = c(1:nrow(gData1)), .after = 0)
gData2WA <- subset(gData2, select = c(" ", " ", "  ", "  ", "  "))
head(gData2WA)
```

```
##
## 1    1    M     68     32   28.0
## 2    2    M     76     66   59.0
## 3    3    F     64     69   68.0
## 4    4    F     64     68   83.5
## 5    5    F      0     39   30.0
## 6    6    M     96     58   79.0
```

gData2WA

```
gData2WAmi <- gData2WA[-c(5, 47, 56), ]
gData2WAmi[which(gData2WAmi$ =='M'), c('  ')] <- gData2WAmi[which(gData2WAmi$ =='M'), c
gData2WAmi[which(gData2WAmi$ =='M'), c('  ')] <- gData2WAmi[which(gData2WAmi$ =='M'), c
head(gData2WAmi)
```

```
##
## 1    1    M     46     14   28.0
## 2    2    M     54     48   59.0
## 3    3    F     64     69   68.0
## 4    4    F     64     68   83.5
## 6    6    M     74     40   79.0
## 7    7    F     96     67   78.0
```

```
library(reshape)
```

```
##
## Attaching package: 'reshape'

## The following objects are masked from 'package:plyr':
##
##     rename, round_any

## The following objects are masked from 'package:reshape2':
##
##     colsplit, melt, recast
```

```
gData2WAmim <- melt(gData2WAmi, id = c(" ", " "), measured = c("  ", "  ", "  "))
names(gData2WAmim)[3:4] <- c('  ', ' ')
head(gData2WAmim)
```

```
##
## 1    1    M       46
## 2    2    M       54
## 3    3    F       64
## 4    4    F       64
## 5    6    M       74
## 6    7    F       96
```

columns wide data long data

6.2

```
library(rstatix)
get_summary_stats(group_by(gData2WAmim,  ,  ),  , type = "mean_sd")
```

```
## # A tibble: 6 x 6
##         variable     n  mean    sd
##   <chr> <fct>    <chr>    <dbl> <dbl> <dbl>
## 1 F                  27  85.5  13.6
```

```
## 2 F                  27  54.9  12.2
## 3 F                  27  63.1  15.0
## 4 M                  27  61.4  16.1
## 5 M                  27  39.0  13.8
## 6 M                  27  59.6  17.3
```

psych describeBy()

```
library(psych)
with(gData2WAmim, describeBy( ,list( ,   )))
```

```
##
##  Descriptive statistics by group
## : F
## :
##    vars  n  mean    sd median trimmed   mad min max range  skew kurtosis   se
## X1    1 27 85.48 13.64     88   87.48 11.86  40  96    56 -1.54     2.27 2.62
## ------------------------------------------------------------
## : M
## :
##    vars  n  mean    sd median trimmed   mad min max range  skew kurtosis   se
## X1    1 27 61.41 16.07     66   63.74 11.86  18  74    56 -1.24     0.45 3.09
## ------------------------------------------------------------
## : F
## :
##    vars  n  mean    sd median trimmed   mad min max range skew kurtosis   se
## X1    1 27 54.85 12.15     55   54.61 14.83  35  85    50 0.23    -0.48 2.34
## ------------------------------------------------------------
## : M
## :
##    vars  n  mean   sd median trimmed mad min max range skew kurtosis   se
## X1    1 27 38.96 13.8     40   38.26 8.9  14  71    57  0.3    -0.27 2.66
## ------------------------------------------------------------
## : F
## :
##    vars  n  mean    sd median trimmed   mad min max range skew kurtosis  se
## X1    1 27 63.09 15.04   58.5   61.91 14.08  43 104    61 0.81    -0.01 2.9
## ------------------------------------------------------------
## : M
## :
##    vars  n  mean   sd median trimmed   mad min max range skew kurtosis   se
## X1    1 27 59.57 17.3     59   58.76 14.83  28 100    72 0.47    -0.32 3.33
```

ggpubr ggline

```
library(ggpubr)
ggline(gData2WAmim,x="  ",y=" ",color=" ", add=c("mean_sd"), size=1)
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <a7>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <a5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <a7>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <a5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e6>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <a7>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <a5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <a7>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <a5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <a7>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <a5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <a7>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <a5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <a7>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <88>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <a5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <a7>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <a5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <a7>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <a5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e6>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <a7>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <a5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <90>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e7>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <be>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <90>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e7>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <be>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <a9>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <a6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e9>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <a1>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9e>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9e>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <8b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <a9>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <a6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e9>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <a1>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9e>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9e>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <8b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e6>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <90>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e7>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <be>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <90>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e7>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <be>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <90>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e7>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <be>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9f>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9d>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9f>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <ad>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9f>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <ab>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9f>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9d>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9f>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <ad>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9f>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <ab>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9f>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9d>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9f>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e4>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <ad>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9f>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <ab>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <a9>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <a6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e9>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <a1>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9e>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9e>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <8b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <a9>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <a6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e9>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <a1>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9e>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9e>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <8b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <a9>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <a6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e9>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <a1>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9e>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9e>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <8b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9f>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9d>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9f>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <ad>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9f>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <ab>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9f>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9d>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9f>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <ad>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9f>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <ab>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9f>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9d>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9f>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <ad>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9f>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <ab>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9f>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9d>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9f>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <ad>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9f>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <ab>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9f>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9d>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9f>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <ad>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9f>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <ab>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9f>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9d>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9f>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <ad>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9f>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <ab>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9f>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9d>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9f>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <ad>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9f>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <ab>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9f>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9d>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9f>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e4>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <ad>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9f>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <ab>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9f>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9d>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9f>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <b8>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <ad>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9f>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <ab>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9f>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9d>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9f>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <ad>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9f>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <ab>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9f>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9d>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9f>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <ad>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9f>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <ab>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <a9>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <a6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e9>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <a1>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9e>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9e>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <8b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <a9>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <a6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e9>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <a1>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9e>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9e>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <8b>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e8>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <a9>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <a6>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e9>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <a1>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9e>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <9e>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  ' in 'mbcsToSbcs': dot substituted for <8b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <90>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e7>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <be>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <90>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e7>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <be>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <90>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e7>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <be>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <a7>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <88>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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```
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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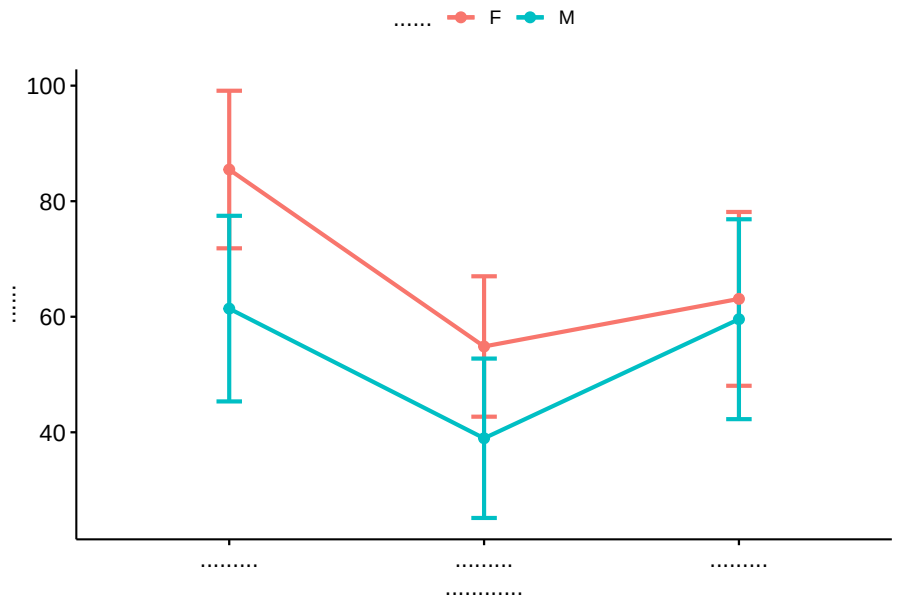
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' ' in 'mbcsToSbcs': dot substituted for <a5>
```



6.3

factor

```
gData2WAmim$  <- factor(gData2WAmim$ )
gData2WAmim$  <- factor(gData2WAmim$ )
str(gData2WAmim)
```

```
## 'data.frame':    162 obs. of  4 variables:
##  $      : Factor w/ 54 levels "1","2","3","4",..: 1 2 3 4 5 6 7 8 9 10 ...
##  $      : Factor w/ 2 levels "F","M": 2 2 1 1 2 1 1 1 2 2 ...
##  $   : Factor w/ 3 levels "  "," ",..: 1 1 1 1 1 1 1 1 1 1 ...
##  $      : num  46 54 64 64 74 96 40 96 74 66 ...
```

levene_test()　　center=median　　center=mean

```
levene_test(group_by(gData2WAmim,   ),   ~  )
```

```
## # A tibble: 3 x 5
##        df1   df2 statistic     p
##   <fct>    <int> <int>     <dbl> <dbl>
## 1          1    52     0.239 0.627
## 2          1    52     0.156 0.695
## 3          1    52     0.273 0.604
```

rstatix package anova_test() res.aov res.aov

sphericity correction Sphericity Corrections Greenhouse-Geisser (GG) Huynh-Feldt (HF) epsilon values p[GG] p[HF] .001

```
library(rstatix)
res.aov <- anova_test(data = gData2WAmim, dv =  , wid =  , between =  , within =  )
res.aov
```

```
## ANOVA Table (type II tests)
##
## $ANOVA
##          Effect DFn DFd      F        p p<.05   ges
## 1             1  52 22.604 1.62e-05     * 0.200
## 2           2 104 68.691 9.66e-20     * 0.359
## 3  :     2 104 10.420 7.51e-05     * 0.078
##
## $`Mauchly's Test for Sphericity`
##          Effect     W     p p<.05
## 1         0.817 0.006     *
## 2  :   0.817 0.006     *
##
## $`Sphericity Corrections`
##          Effect   GGe      DF[GG]    p[GG] p[GG]<.05   HFe      DF[HF]    p[HF]
## 1         0.846 1.69, 87.94 4.53e-17         * 0.871 1.74, 90.57 1.65e-17
## 2  :   0.846 1.69, 87.94 2.11e-04         * 0.871 1.74, 90.57 1.78e-04
##   p[HF]<.05
## 1         *
## 2         *
```

get_anova_table() F(1, 52) = 22.6, p < .001 F(1.69, 87.94) = 68.7, p < .001 F(1.69, 87.94) = 10.4, p < .001

```
get_anova_table(res.aov)
```

```
## ANOVA Table (type II tests)
##
##          Effect  DFn   DFd      F        p p<.05   ges
```

```
## 1            1.00 52.00 22.604 1.62e-05     * 0.200
## 2         1.69 87.94 68.691 4.53e-17     * 0.359
## 3  :   1.69 87.94 10.420 2.11e-04     * 0.078
```

6.3.1

adjust_pvalue() alpha alpha .05 p value

```
anova1 <- anova_test(group_by(gData2WAmim,   ), dv= , wid= , between= )
adjust_pvalue(get_anova_table(anova1), method="bonferroni")
```

```
## # A tibble: 3 x 9
##      Effect   DFn   DFd      F           p `p<.05`   ges       p.adj
##   <fct>    <chr>  <dbl> <dbl>  <dbl>       <dbl> <chr>   <dbl>       <dbl>
## 1             1    52 35.2   0.000000243 "*"     0.404 0.000000729
## 2             1    52 20.2   0.0000398   "*"     0.279 0.000119
## 3             1    52  0.636 0.429       ""      0.012 1
```

```
anova2 <- anova_test(group_by(gData2WAmim,  ), dv= , wid= , within=  )
adjust_pvalue(get_anova_table(anova2), method = "bonferroni")
```

```
## # A tibble: 2 x 9
##      Effect     DFn   DFd     F        p `p<.05`   ges    p.adj
##   <fct> <chr>    <dbl> <dbl> <dbl>    <dbl> <chr>   <dbl>    <dbl>
## 1 F            2    52  43.6 7.63e-12 *       0.482 1.53e-11
## 2 M            2    52  34.4 3.03e-10 *       0.301 6.06e-10
```

vs. vs. vs. vs. vs.

```
pairwise_t_test(group_by(gData2WAmim, ),   ~   , paired = TRUE, p.adjust.method = "bonferroni")
```

```
## # A tibble: 6 x 11
##      .y.   group1 group2    n1    n2 statistic    df             p      p.adj
## * <fct> <chr> <chr>  <chr>  <int> <int>     <dbl> <dbl>         <dbl>      <dbl>
## 1 F               27    27     8.73     26 0.00000000334    1   e-8
## 2 F               27    27     5.72     26 0.00000506       1.52e-5
## 3 F               27    27    -3.13     26 0.004            1.3 e-2
## 4 M               27    27     6.67     26 0.000000447      1.34e-6
## 5 M               27    27     0.557    26 0.582            1   e+0
## 6 M               27    27    -9.27     26 0.000000001      3   e-9
## # ... with 1 more variable: p.adj.signif <chr>
```

6.3.2

levels

```
pairwise_t_test(gData2WAmim,  ~  , paired = TRUE, p.adjust.method = "bonferroni")
```

```
## # A tibble: 3 x 10
##   .y.   group1 group2    n1    n2 statistic    df        p    p.adj p.adj.signif
## * <chr> <chr>  <chr>  <int> <int>     <dbl> <dbl>    <dbl>    <dbl> <chr>
## 1            54    54     10.7     53 6.73e-15 2.02e-14 ****
## 2            54    54      4.18    53 1.1 e- 4 3.3 e- 4 ***
## 3            54    54     -7.56    53 5.6 e-10 1.68e- 9 ****
```

Chapter 7

R mtcars

7.1

7.1.1

mtcars mtcars R dataset 1974 Motor Trend 32 11 mpg cyl disp hp wt qsec

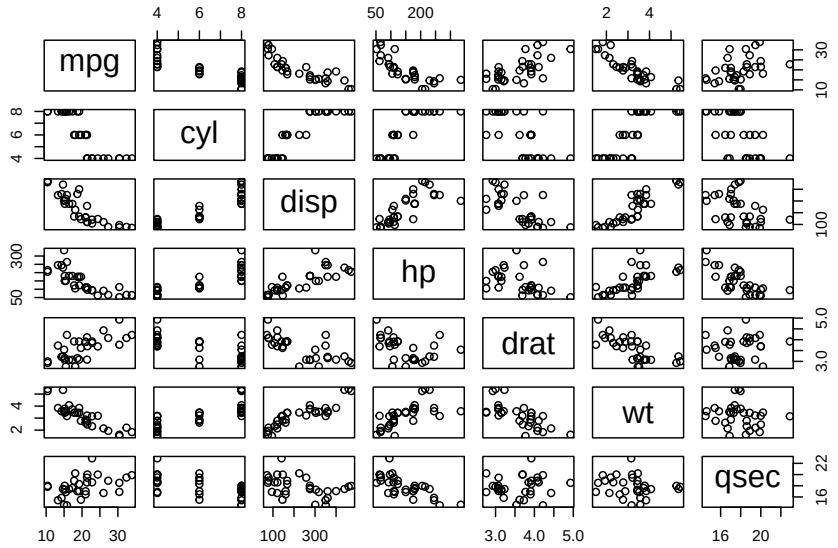
```
data(mtcars)
head(mtcars, 10)
```

```
##                    mpg cyl  disp  hp drat    wt  qsec vs am gear carb
## Mazda RX4         21.0   6 160.0 110 3.90 2.620 16.46  0  1    4    4
## Mazda RX4 Wag     21.0   6 160.0 110 3.90 2.875 17.02  0  1    4    4
## Datsun 710        22.8   4 108.0  93 3.85 2.320 18.61  1  1    4    1
## Hornet 4 Drive    21.4   6 258.0 110 3.08 3.215 19.44  1  0    3    1
## Hornet Sportabout 18.7   8 360.0 175 3.15 3.440 17.02  0  0    3    2
## Valiant           18.1   6 225.0 105 2.76 3.460 20.22  1  0    3    1
## Duster 360        14.3   8 360.0 245 3.21 3.570 15.84  0  0    3    4
## Merc 240D         24.4   4 146.7  62 3.69 3.190 20.00  1  0    4    2
## Merc 230          22.8   4 140.8  95 3.92 3.150 22.90  1  0    4    2
## Merc 280          19.2   6 167.6 123 3.92 3.440 18.30  1  0    4    4
```

7.1.2

plot()

```
plot(mtcars[1:7])
```




```
library(Hmisc)
rcorr(data.matrix(mtcars[1:7]))
```

```
##        mpg   cyl  disp    hp  drat    wt  qsec
## mpg   1.00 -0.85 -0.85 -0.78  0.68 -0.87  0.42
## cyl  -0.85  1.00  0.90  0.83 -0.70  0.78 -0.59
## disp -0.85  0.90  1.00  0.79 -0.71  0.89 -0.43
## hp   -0.78  0.83  0.79  1.00 -0.45  0.66 -0.71
## drat  0.68 -0.70 -0.71 -0.45  1.00 -0.71  0.09
## wt   -0.87  0.78  0.89  0.66 -0.71  1.00 -0.17
## qsec  0.42 -0.59 -0.43 -0.71  0.09 -0.17  1.00
##
## n= 32
##
##
## P
##      mpg    cyl    disp   hp     drat   wt     qsec
## mpg         0.0000 0.0000 0.0000 0.0000 0.0000 0.0171
## cyl  0.0000        0.0000 0.0000 0.0000 0.0000 0.0004
## disp 0.0000 0.0000        0.0000 0.0000 0.0000 0.0131
```

```
## hp   0.0000 0.0000 0.0000        0.0100 0.0000 0.0000
## drat 0.0000 0.0000 0.0000 0.0100        0.0000 0.6196
## wt   0.0000 0.0000 0.0000 0.0000 0.0000        0.3389
## qsec 0.0171 0.0004 0.0131 0.0000 0.6196 0.3389
```

7.2

7.2.1

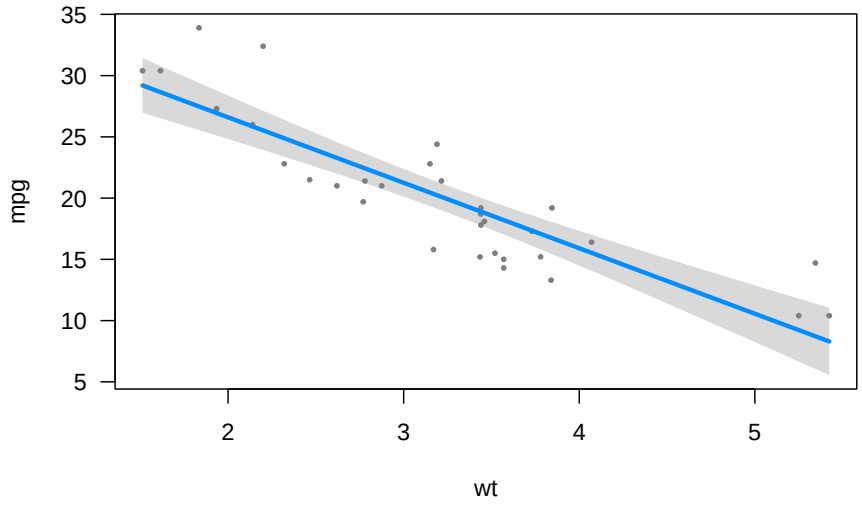
lm() wt mpg R-square = 0.75 F(1,30) = 91.38 p<.001 F
mpg = -5.3445*wt + 37.2851

```
model.mpg.wt <- lm(mpg ~ wt, data = mtcars)
summary(model.mpg.wt)
```

```
##
## Call:
## lm(formula = mpg ~ wt, data = mtcars)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -4.5432 -2.3647 -0.1252  1.4096  6.8727
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  37.2851     1.8776  19.858  < 2e-16 ***
## wt           -5.3445     0.5591  -9.559 1.29e-10 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 3.046 on 30 degrees of freedom
## Multiple R-squared:  0.7528, Adjusted R-squared:  0.7446
## F-statistic: 91.38 on 1 and 30 DF,  p-value: 1.294e-10
```

package visreg visreg()

```
library(visreg)
visreg(model.mpg.wt)
```



7.2.2

wt hp disp mpg

lm() R-square = 0.8268 F(3,28) = 44.57, p < .01 disp

```
model.mpg.whd <- update(model.mpg.wt, .~. + hp + disp, data=mtcars)
model.mpg.whd <- lm(mpg ~ wt + hp + disp, data = mtcars)
summary(model.mpg.whd)
```

```
##
## Call:
## lm(formula = mpg ~ wt + hp + disp, data = mtcars)
##
## Residuals:
##    Min     1Q Median     3Q    Max
## -3.891 -1.640 -0.172  1.061  5.861
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) 37.105505   2.110815  17.579  < 2e-16 ***
## wt          -3.800891   1.066191  -3.565  0.00133 **
## hp          -0.031157   0.011436  -2.724  0.01097 *
## disp        -0.000937   0.010350  -0.091  0.92851
```

```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 2.639 on 28 degrees of freedom
## Multiple R-squared:  0.8268, Adjusted R-squared:  0.8083
## F-statistic: 44.57 on 3 and 28 DF,  p-value: 8.65e-11
```

pcor() (partial correlation) spcor() (semi-partial correlation) all ps $< .05$

```
library(ppcor)
round(pcor(mtcars[c(1,6,4,3)])$estimate, 03) #partial
```

```
##         mpg     wt     hp   disp
## mpg   1.000 -0.559 -0.458 -0.017
## wt   -0.559  1.000 -0.370  0.651
## hp   -0.458 -0.370  1.000  0.521
## disp -0.017  0.651  0.521  1.000
```

```
round(pcor(mtcars[c(1,6,4,3)])$p.value, 03)
```

```
##        mpg    wt    hp  disp
## mpg  0.000 0.001 0.011 0.929
## wt   0.001 0.000 0.044 0.000
## hp   0.011 0.044 0.000 0.003
## disp 0.929 0.000 0.003 0.000
```

wt

```
round(spcor(mtcars[c(1,6,4,3)])$estimate, 03) #semi-partial
```

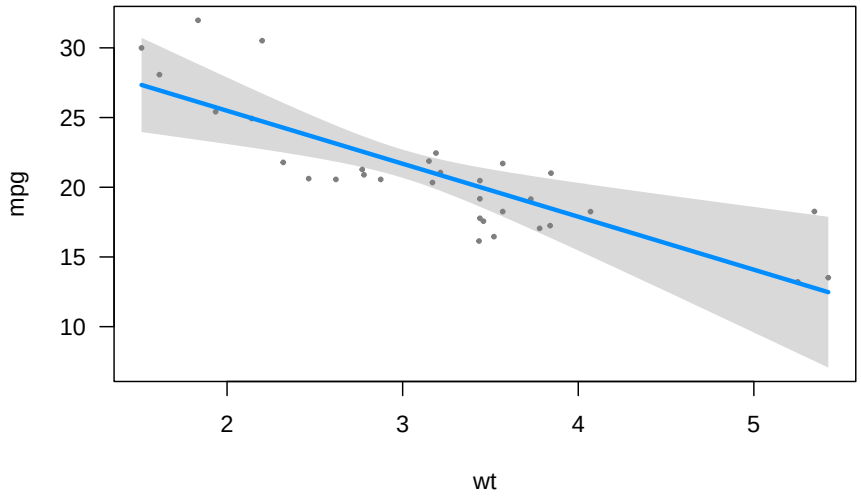
```
##         mpg     wt     hp   disp
## mpg   1.000 -0.280 -0.214 -0.007
## wt   -0.254  1.000 -0.150  0.323
## hp   -0.277 -0.214  1.000  0.328
## disp -0.006  0.317  0.226  1.000
```

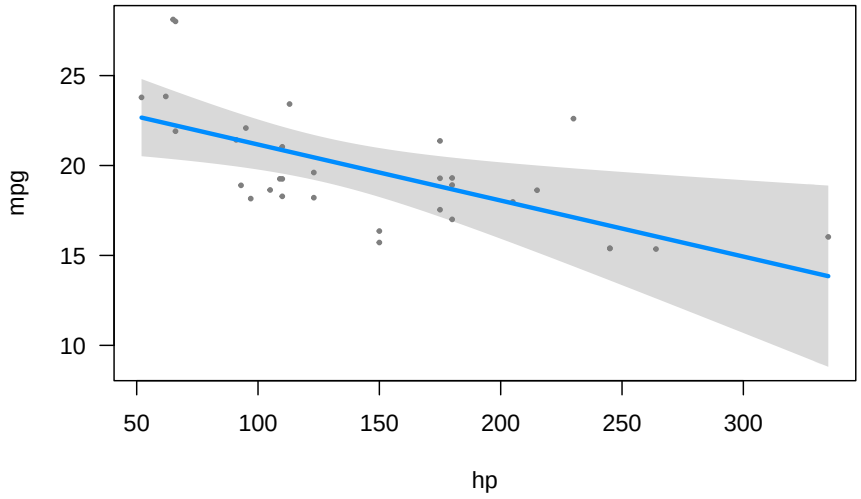
```
round(spcor(mtcars[c(1,6,4,3)])$p.value, 03)
```

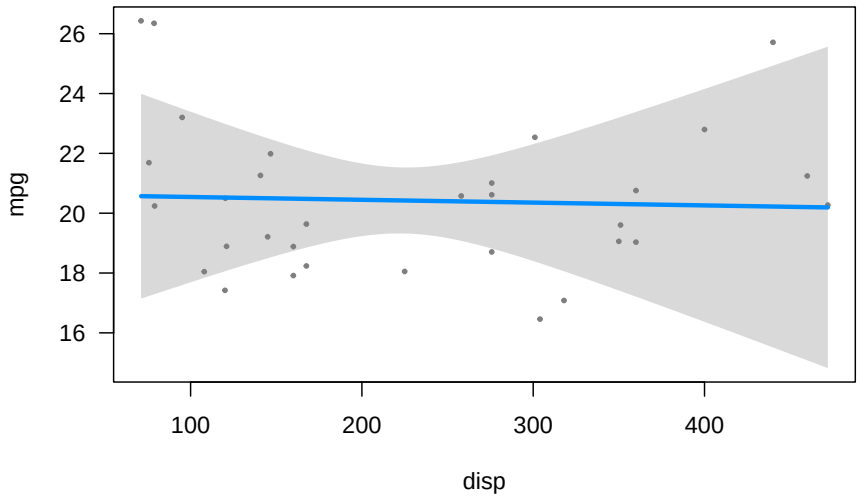
```
##        mpg    wt    hp  disp
## mpg  0.000 0.133 0.256 0.970
## wt   0.176 0.000 0.429 0.081
## hp   0.139 0.256 0.000 0.076
## disp 0.974 0.088 0.230 0.000
```

mpg

```
visreg(model.mpg.whd)
```







predict()

```
predict(model.mpg.whd,
        new = data.frame(wt = 5, hp = 250, disp = 300, am = "Manual"),
        interval = "confidence",
        level = .95
)
```

```
##        fit      lwr      upr
## 1 10.03081 6.335154 13.72647
```

7.2.3

ANOVA() F(2, 83.33) = 5.98, p<.001

```
anova(model.mpg.wt, model.mpg.whd)
```

```
## Analysis of Variance Table
##
## Model 1: mpg ~ wt
## Model 2: mpg ~ wt + hp + disp
##   Res.Df    RSS Df Sum of Sq     F   Pr(>F)
## 1     30 278.32
```

```
## 2     28 194.99  2    83.331 5.983 0.006863 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

AIC()　AIC(Akaike information criterion)　mpg　AIC

```
AIC(model.mpg.wt)
```

```
## [1] 166.0294
```

```
AIC(model.mpg.whd)
```

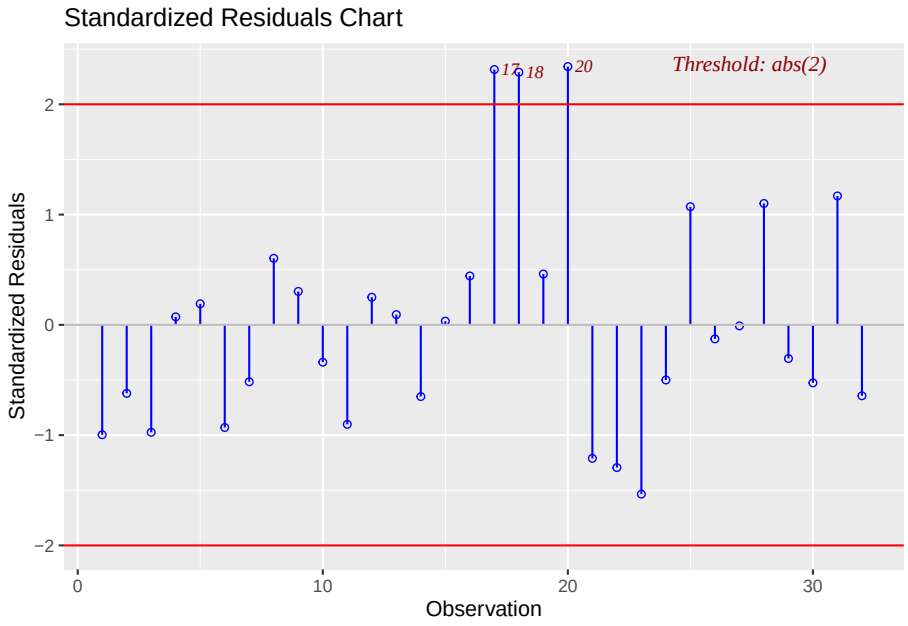
```
## [1] 158.643
```

7.3

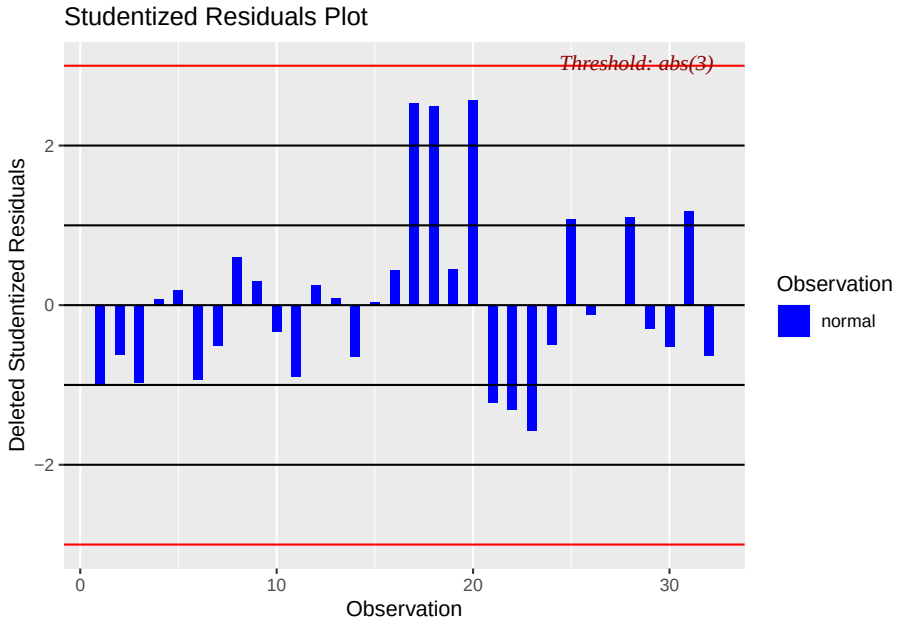
7.3.1

standardize resuduals studentize residuals

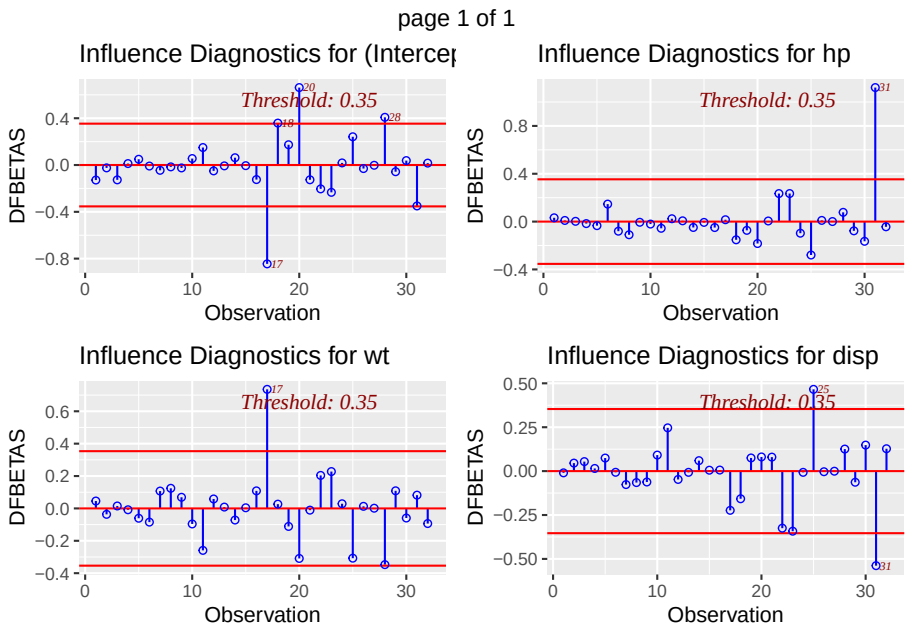
```
library(olsrr)
ols_plot_resid_stand(model.mpg.whd)
```



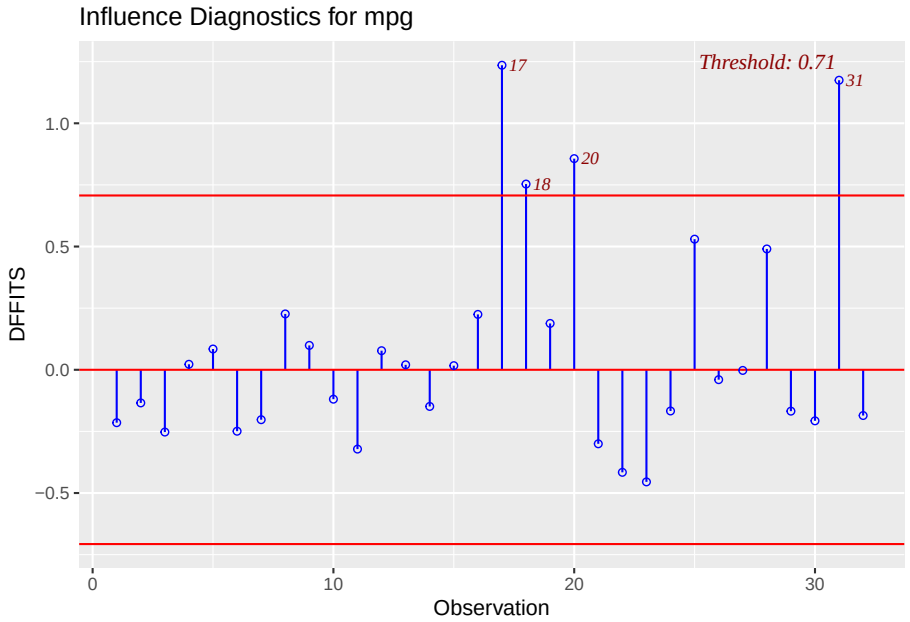

```
ols_plot_resid_stud(model.mpg.whd)
```



```
ols_plot_dfbetas(model.mpg.whd)
```

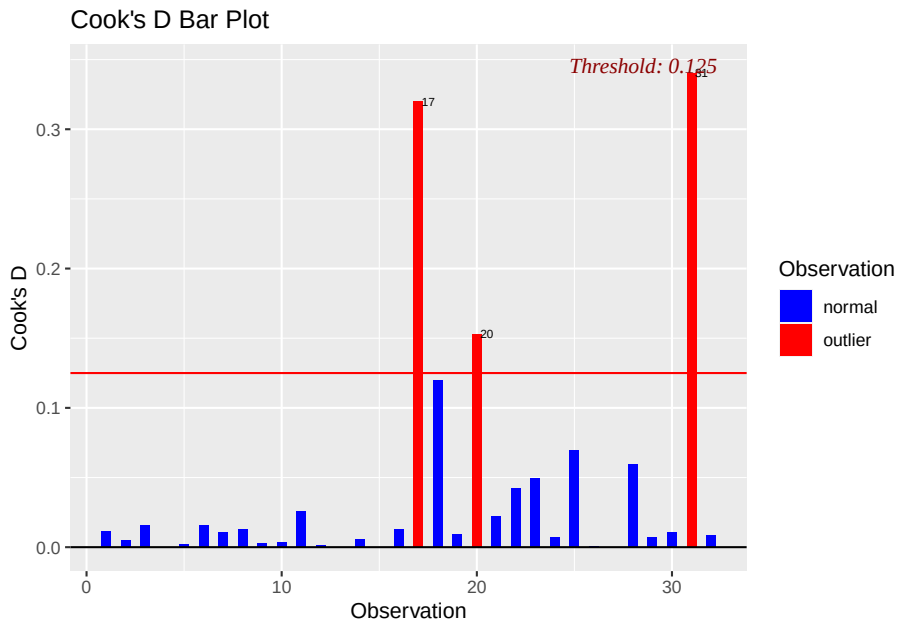



```
ols_plot_dffits(model.mpg.whd)
```

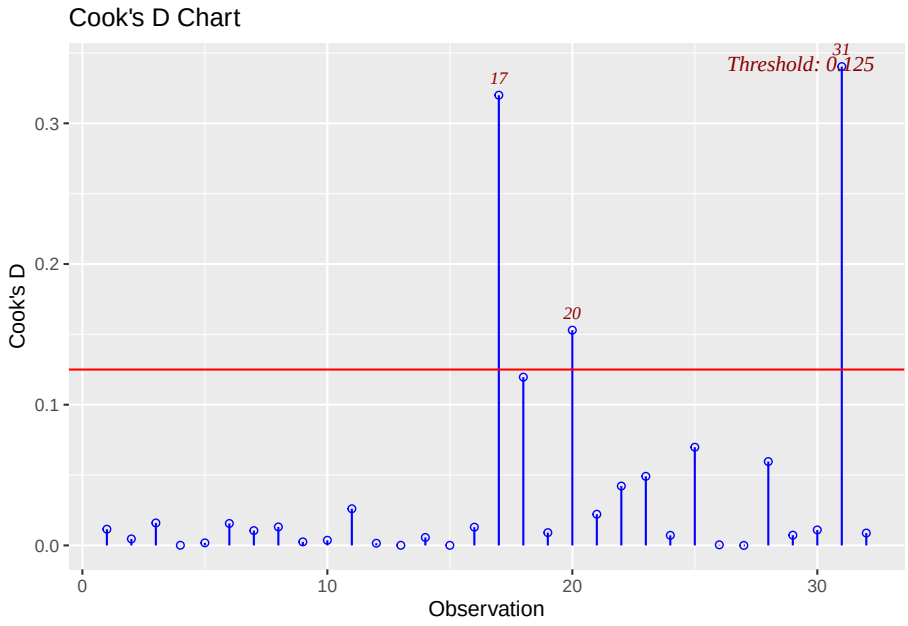


Cook's distance

```
ols_plot_cooksd_bar(model.mpg.whd)
```

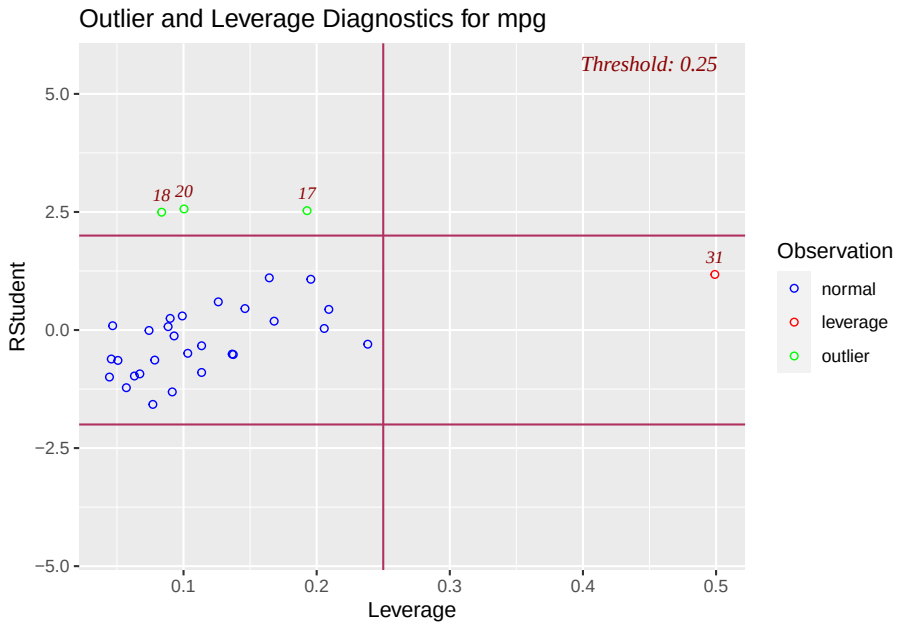



```
ols_plot_cooksd_chart(model.mpg.whd)
```



residual leverage

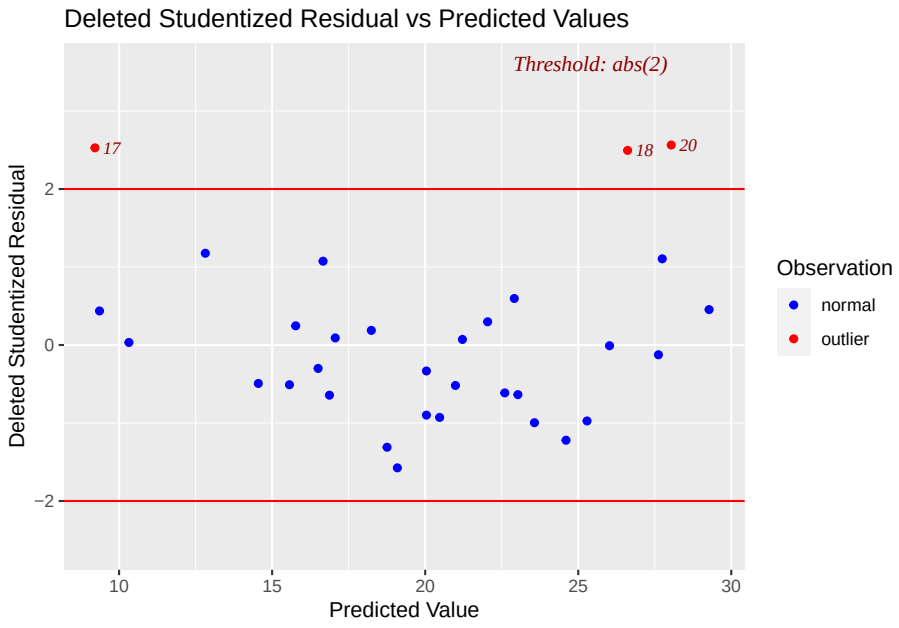
```
library(olsrr)
ols_plot_resid_lev(model.mpg.whd)
```



7.3.2 Homoscedasticity

residual fit

```
ols_plot_resid_stud_fit(model.mpg.whd)
```



7.3.3 multicollinearity

vif tolerance VIF 10 VIF 1 tolerance 0.1 tolerance 0.2

```
library(car)
vif(model.mpg.whd)
```

```
##       wt       hp     disp
## 4.844618 2.736633 7.324517
```

```
1/vif(model.mpg.whd)
```

```
##        wt        hp      disp
## 0.2064146 0.3654126 0.1365278
```

7.3.4

residuals

```
shapiro.test(residuals(model.mpg.whd))
```

```
##
##  Shapiro-Wilk normality test
##
## data:  residuals(model.mpg.whd)
## W = 0.92734, p-value = 0.03305
```

7.3.5

Durbin-Watson test autocorrelation

```
library(car)
dwt(model.mpg.whd)
```

```
##  lag Autocorrelation D-W Statistic p-value
##    1       0.2926117      1.367284    0.03
##  Alternative hypothesis: rho != 0
```

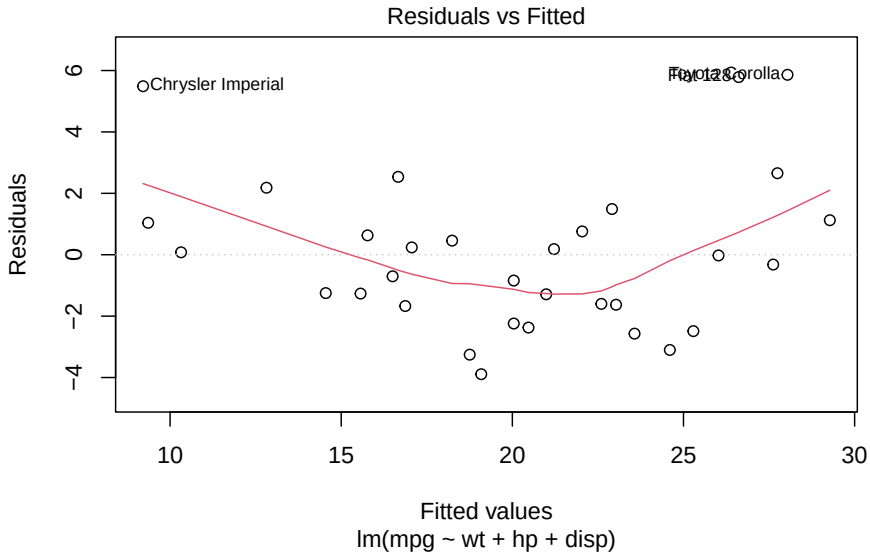
```
durbinWatsonTest(model.mpg.whd)
```

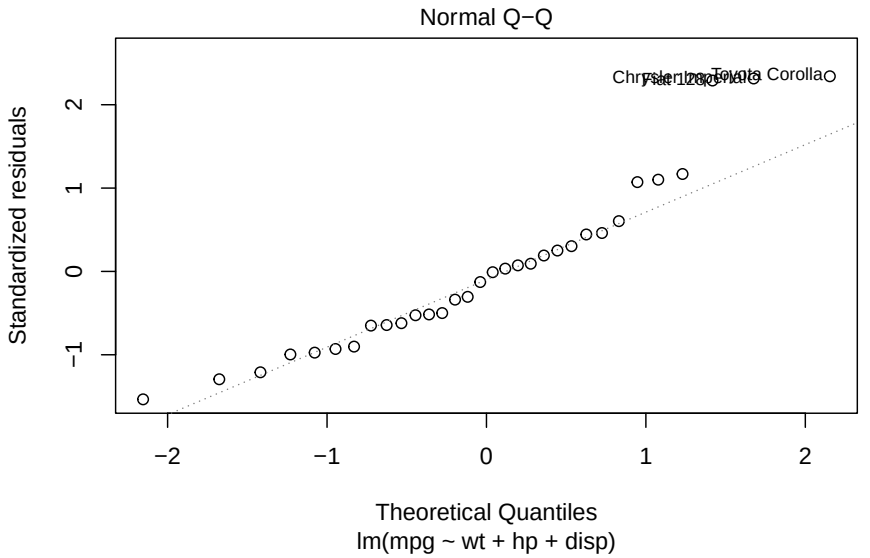
```
##  lag Autocorrelation D-W Statistic p-value
##    1       0.2926117      1.367284    0.04
##  Alternative hypothesis: rho != 0
```

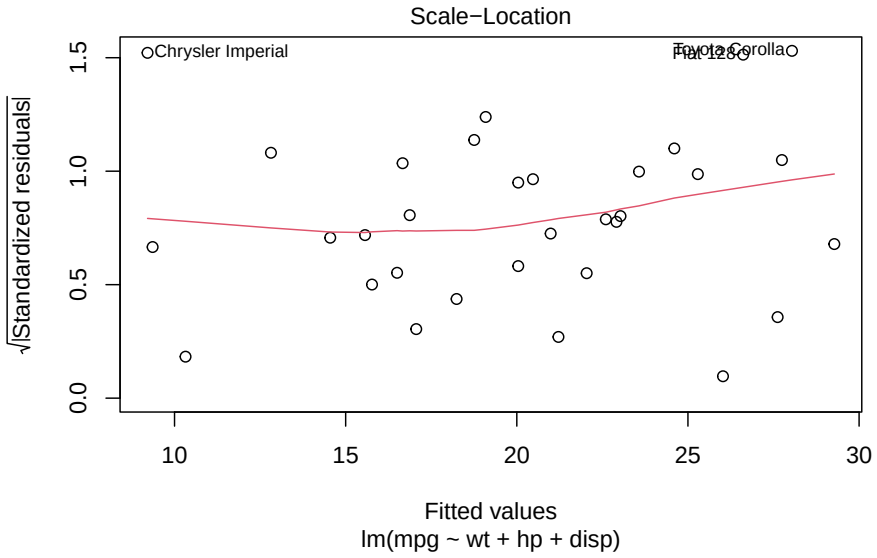
7.3.6

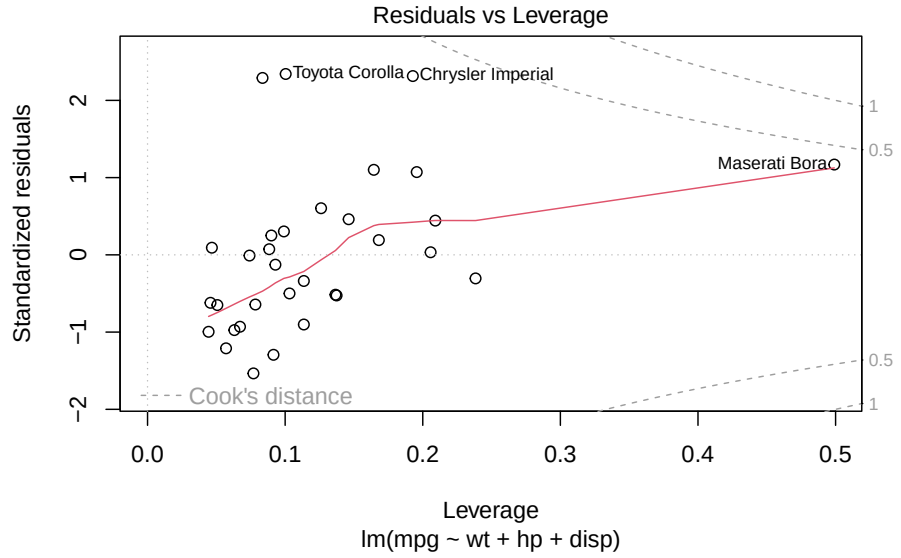
plot() which=1:6

```
plot(model.mpg.whd)
```

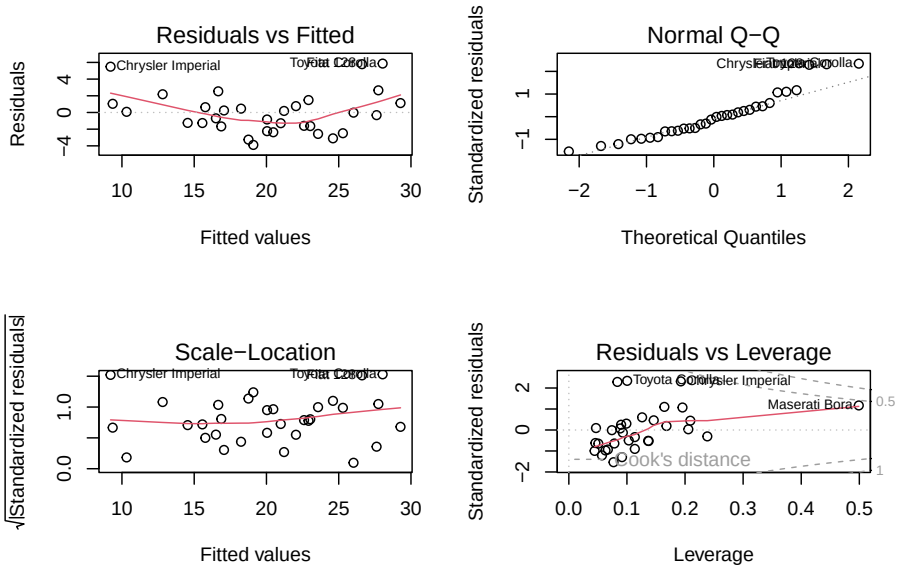

Residuals vs Fitted
Chrysler Imperial
Toyota Corolla
Fiat 128
Residuals
6
4
2
0
−2
−4
10
15
20
25
30
Fitted values
lm(mpg ~ wt + hp + disp)


Normal Q−Q
Toyota Corolla
Standardized residuals
2
1
0
−1
−2
−1
0
1
2
Theoretical Quantiles
lm(mpg ~ wt + hp + disp)





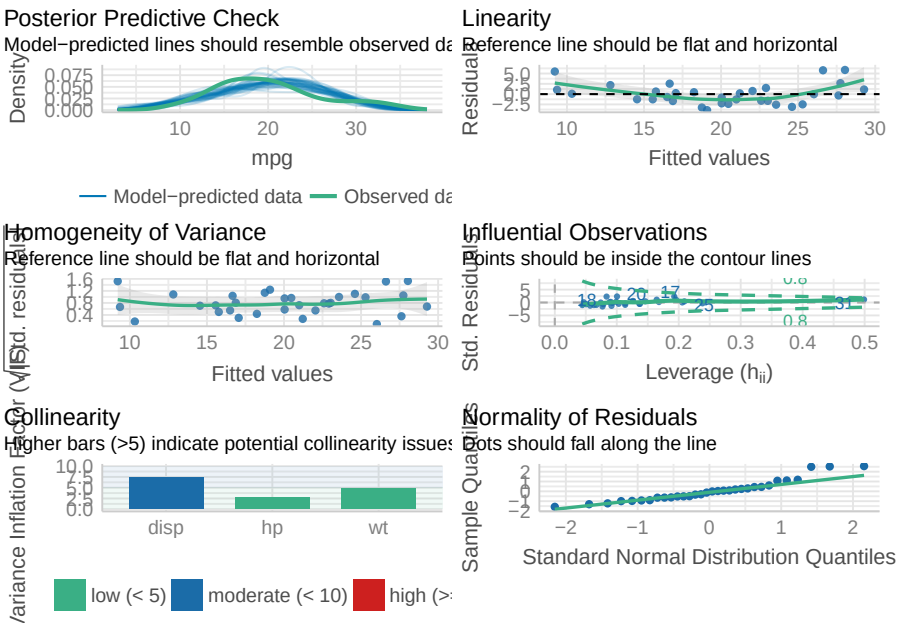

```
par(mfrow=c(2,2))
plot(model.mpg.whd)
```




```
par(mfrow=c(1,1))
```

performance package

```
library(performance)
library(see)
library(patchwork)
check_model(model.mpg.whd)
```




```
mtcars$residuals <- resid(model.mpg.whd)
mtcars$standardized.residuals <- rstandard(model.mpg.whd)
mtcars$studentized.residuals <- rstudent(model.mpg.whd)
mtcars$cooks.distance <- cooks.distance(model.mpg.whd)
mtcars$leverage <- hatvalues(model.mpg.whd)
mtcars <- cbind(mtcars, dfbetas(model.mpg.whd))
names(mtcars)[12:15] <- c('db_intercept', 'db_wt', 'db_hp', 'db_disp')
mtcars$dffit <- dffits(model.mpg.whd)
mtcars$fitted <- fitted(model.mpg.whd)
```

7.4

7.4.1

lm()

```
mtcars2 <- mtcars[c(1,6,4,3)]
nullM <- lm(mpg ~ 1, data = mtcars2)
fullM <- lm(mpg ~ ., data = mtcars2)
forM <- step(nullM, scope=list(lower=nullM, upper=fullM), direction="forward")
```

```
## Start:  AIC=115.94
## mpg ~ 1
##
##        Df Sum of Sq     RSS     AIC
## + wt    1    847.73  278.32  73.217
## + disp  1    808.89  317.16  77.397
## + hp    1    678.37  447.67  88.427
## <none>              1126.05 115.943
##
## Step:  AIC=73.22
## mpg ~ wt
##
##        Df Sum of Sq    RSS    AIC
## + hp    1    83.274 195.05 63.840
## + disp  1    31.639 246.68 71.356
## <none>              278.32 73.217
##
## Step:  AIC=63.84
## mpg ~ wt + hp
##
##        Df Sum of Sq    RSS    AIC
## <none>              195.05 63.840
## + disp  1   0.05708 194.99 65.831
```

```
summary(forM)
```

```
##
## Call:
## lm(formula = mpg ~ wt + hp, data = mtcars2)
##
## Residuals:
##    Min     1Q Median     3Q    Max
## -3.941 -1.600 -0.182  1.050  5.854
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) 37.22727    1.59879  23.285  < 2e-16 ***
## wt          -3.87783    0.63273  -6.129 1.12e-06 ***
## hp          -0.03177    0.00903  -3.519  0.00145 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 2.593 on 29 degrees of freedom
## Multiple R-squared:  0.8268, Adjusted R-squared:  0.8148
## F-statistic: 69.21 on 2 and 29 DF,  p-value: 9.109e-12
```

7.4.2

backward method

```
fullM <- lm(mpg ~ ., data = mtcars2)
# backM <- step(fullM, scope=list(upper=fullM), direction='backward') #
backM <- step(fullM, direction='backward')
```

```
## Start:  AIC=65.83
## mpg ~ wt + hp + disp
##
##        Df Sum of Sq    RSS    AIC
## - disp  1     0.057 195.05 63.840
## <none>              194.99 65.831
## - hp    1    51.692 246.68 71.356
## - wt    1    88.503 283.49 75.806
##
## Step:  AIC=63.84
## mpg ~ wt + hp
##
##        Df Sum of Sq    RSS    AIC
## <none>              195.05 63.840
## - hp    1    83.274 278.32 73.217
## - wt    1   252.627 447.67 88.427
```

```
summary(backM)
```

```
##
## Call:
## lm(formula = mpg ~ wt + hp, data = mtcars2)
##
## Residuals:
##    Min     1Q Median     3Q    Max
## -3.941 -1.600 -0.182  1.050  5.854
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) 37.22727    1.59879  23.285  < 2e-16 ***
## wt          -3.87783    0.63273  -6.129 1.12e-06 ***
## hp          -0.03177    0.00903  -3.519  0.00145 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 2.593 on 29 degrees of freedom
## Multiple R-squared:  0.8268, Adjusted R-squared:  0.8148
## F-statistic: 69.21 on 2 and 29 DF,  p-value: 9.109e-12
```

7.4.3

Stepwise method

7.4.3.1 full model

```
fullM <- lm(mpg ~ ., data = mtcars2)
# stepM1 <- step(fullM, scope = list(upper=fullM), direction="both") #
stepM1 <- step(fullM, direction="both")
```

```
## Start:  AIC=65.83
## mpg ~ wt + hp + disp
##
##        Df Sum of Sq    RSS    AIC
## - disp  1     0.057 195.05 63.840
## <none>              194.99 65.831
## - hp    1    51.692 246.68 71.356
## - wt    1    88.503 283.49 75.806
##
## Step:  AIC=63.84
## mpg ~ wt + hp
##
##        Df Sum of Sq    RSS    AIC
## <none>              195.05 63.840
## + disp  1     0.057 194.99 65.831
## - hp    1    83.274 278.32 73.217
## - wt    1   252.627 447.67 88.427
```

7.4.3.2 null model

full model

```
nullM <- lm(mpg ~ 1, data = mtcars2)
stepM2 <- step(nullM, scope = list(upper=fullM), direction="both")
```

```
## Start:  AIC=115.94
## mpg ~ 1
##
##        Df Sum of Sq     RSS     AIC
## + wt    1    847.73  278.32  73.217
## + disp  1    808.89  317.16  77.397
## + hp    1    678.37  447.67  88.427
```

```
## <none>              1126.05 115.943
##
## Step:  AIC=73.22
## mpg ~ wt
##
##        Df Sum of Sq     RSS     AIC
## + hp    1     83.27  195.05  63.840
## + disp  1     31.64  246.68  71.356
## <none>               278.32  73.217
## - wt    1    847.73 1126.05 115.943
##
## Step:  AIC=63.84
## mpg ~ wt + hp
##
##        Df Sum of Sq    RSS    AIC
## <none>              195.05 63.840
## + disp  1     0.057 194.99 65.831
## - hp    1    83.274 278.32 73.217
## - wt    1   252.627 447.67 88.427
```

```
summary(stepM1)
```

```
##
## Call:
## lm(formula = mpg ~ wt + hp, data = mtcars2)
##
## Residuals:
##    Min     1Q Median     3Q    Max
## -3.941 -1.600 -0.182  1.050  5.854
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) 37.22727    1.59879  23.285  < 2e-16 ***
## wt          -3.87783    0.63273  -6.129 1.12e-06 ***
## hp          -0.03177    0.00903  -3.519  0.00145 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 2.593 on 29 degrees of freedom
## Multiple R-squared:  0.8268, Adjusted R-squared:  0.8148
## F-statistic: 69.21 on 2 and 29 DF,  p-value: 9.109e-12
```

```
summary(stepM2)
```

```
##
```

```
## Call:
## lm(formula = mpg ~ wt + hp, data = mtcars2)
##
## Residuals:
##    Min     1Q Median     3Q    Max
## -3.941 -1.600 -0.182  1.050  5.854
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) 37.22727    1.59879  23.285  < 2e-16 ***
## wt          -3.87783    0.63273  -6.129 1.12e-06 ***
## hp          -0.03177    0.00903  -3.519  0.00145 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 2.593 on 29 degrees of freedom
## Multiple R-squared:  0.8268, Adjusted R-squared:  0.8148
## F-statistic: 69.21 on 2 and 29 DF,  p-value: 9.109e-12
```

7.4.3.3

stepAIC() scope backward scope both direction forward backward both

```
library(MASS)
summary(stepAIC(model.mpg.whd)) # scope backward
```

```
## Start:  AIC=65.83
## mpg ~ wt + hp + disp
##
##        Df Sum of Sq    RSS    AIC
## - disp  1     0.057 195.05 63.840
## <none>              194.99 65.831
## - hp    1    51.692 246.68 71.356
## - wt    1    88.503 283.49 75.806
##
## Step:  AIC=63.84
## mpg ~ wt + hp
##
##        Df Sum of Sq    RSS    AIC
## <none>              195.05 63.840
## - hp    1    83.274 278.32 73.217
## - wt    1   252.627 447.67 88.427

##
```

```
## Call:
## lm(formula = mpg ~ wt + hp, data = mtcars)
##
## Residuals:
##    Min     1Q Median     3Q    Max
## -3.941 -1.600 -0.182  1.050  5.854
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) 37.22727    1.59879  23.285  < 2e-16 ***
## wt          -3.87783    0.63273  -6.129 1.12e-06 ***
## hp          -0.03177    0.00903  -3.519  0.00145 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 2.593 on 29 degrees of freedom
## Multiple R-squared:  0.8268, Adjusted R-squared:  0.8148
## F-statistic: 69.21 on 2 and 29 DF,  p-value: 9.109e-12
```

```
summary(stepAIC(model.mpg.whd, scope = list(upper = ~wt+hp+disp, lower = ~1)))  # scop
```

```
## Start:  AIC=65.83
## mpg ~ wt + hp + disp
##
##        Df Sum of Sq    RSS    AIC
## - disp  1     0.057 195.05 63.840
## <none>              194.99 65.831
## - hp    1    51.692 246.68 71.356
## - wt    1    88.503 283.49 75.806
##
## Step:  AIC=63.84
## mpg ~ wt + hp
##
##        Df Sum of Sq    RSS    AIC
## <none>              195.05 63.840
## + disp  1     0.057 194.99 65.831
## - hp    1    83.274 278.32 73.217
## - wt    1   252.627 447.67 88.427

##
## Call:
## lm(formula = mpg ~ wt + hp, data = mtcars)
##
## Residuals:
##    Min     1Q Median     3Q    Max
```

```
## -3.941 -1.600 -0.182  1.050  5.854
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) 37.22727    1.59879  23.285  < 2e-16 ***
## wt          -3.87783    0.63273  -6.129 1.12e-06 ***
## hp          -0.03177    0.00903  -3.519  0.00145 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 2.593 on 29 degrees of freedom
## Multiple R-squared:  0.8268, Adjusted R-squared:  0.8148
## F-statistic: 69.21 on 2 and 29 DF,  p-value: 9.109e-12
```

7.5

levels levels dummy coding

```
mtcars$cyl<-factor(mtcars$cyl)
contrasts(mtcars$cyl)<-contr.treatment(3, base = 1) #generate contrasts
mtcars$cyl
```

```
##  [1] 6 6 4 6 8 6 8 4 4 6 6 8 8 8 8 8 8 4 4 4 4 8 8 8 8 4 4 4 8 6 8 4
## attr(,"contrasts")
##   2 3
## 4 0 0
## 6 1 0
## 8 0 1
## Levels: 4 6 8
```

```
model.mpg.cyl <- lm(mpg ~ cyl, data = mtcars)
summary(model.mpg.cyl)
```

```
##
## Call:
## lm(formula = mpg ~ cyl, data = mtcars)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -5.2636 -1.8357  0.0286  1.3893  7.2364
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
```

```
## (Intercept)  26.6636     0.9718  27.437  < 2e-16 ***
## cyl2         -6.9208     1.5583  -4.441 0.000119 ***
## cyl3        -11.5636     1.2986  -8.905 8.57e-10 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 3.223 on 29 degrees of freedom
## Multiple R-squared:  0.7325, Adjusted R-squared:  0.714
## F-statistic:  39.7 on 2 and 29 DF,  p-value: 4.979e-09
```

Chapter 8

R

8.1

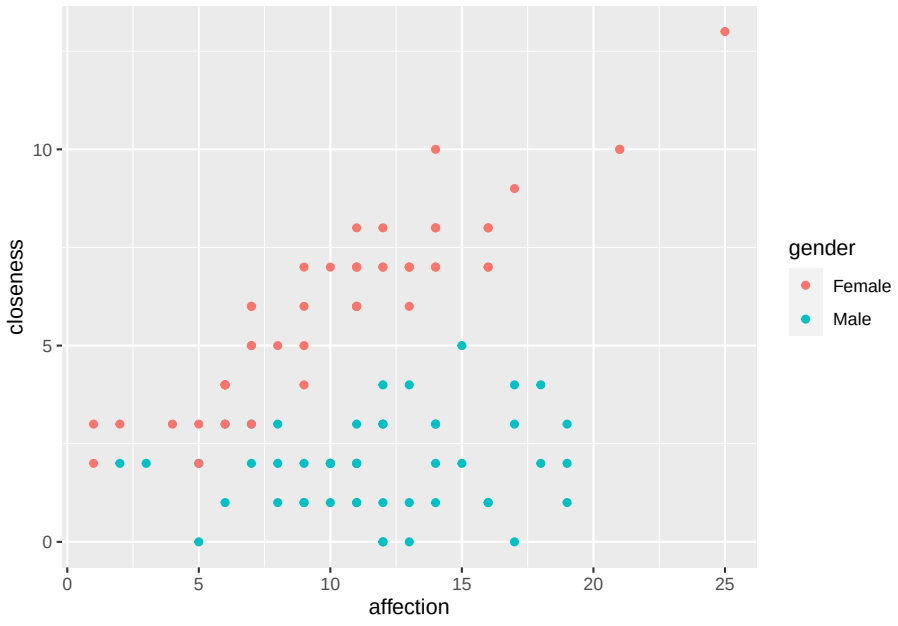
JASP moderation.csv R

closeness affection

```
cData <- read.table("moderation.csv", header=TRUE, sep=",")
```

affection	closeness	gender_dummy	gender
7	2	0	Male
6	1	0	Male
12	0	0	Male
14	1	0	Male
17	3	0	Male
19	2	0	Male

```
library(ggplot2)
qplot(affection, closeness, colour = gender, data = cData)
```



8.2

8.2.1

pequod lmres() type=nested

```
library(pequod)
m1 <- lmres(closeness~affection*gender, centered=c("affection"), data=cData)
summary(m1, type="nested")
```

```
## **Models**
##
## Model 1: closeness ~ affection + genderMale
## <environment: 0x00000185d29df680>
##
## Model 2: closeness ~ affection + genderMale + affection.XX.genderMale
## <environment: 0x00000185d29df680>
##
##
## **Statistics**
```

```
##
##             R     R^2   Adj. R^2   Diff.R^2    F     df1  df2    p.value
## Model 1    0.88   0.77       0.76       0.77 160.04   2.00   97 < 2.2e-16 ***
## Model 2:   0.93   0.86       0.86       0.09 197.52   3.00   96 < 2.2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## **F change**
##
##   Res.Df RSS  Df Sum of Sq    F  Pr(>F)
## 1     97 177
## 2     96 106   1        71 64.1 2.7e-12 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## **Coefficients**
##
##                           Estimate    StdErr   t.value    beta   p.value
## -- Model 1 --
##
## (Intercept)                6.29135   0.19168  32.82144         < 2.2e-16 ***
## affection                  0.26269   0.02963   8.86462  0.4367 < 2.2e-16 ***
## genderMale                -4.46269   0.27189 -16.41354 -0.8085 < 2.2e-16 ***
##
##
## -- Model 2 --
##
## (Intercept)                6.36873   0.14950  42.60126         < 2.2e-16 ***
## affection                  0.41746   0.03009  13.87403  0.6939 < 2.2e-16 ***
## genderMale                -4.42985   0.21165 -20.93042 -0.8026 < 2.2e-16 ***
## affection.XX.genderMale   -0.37521   0.04685  -8.00877 -0.3996 < 2.2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

9% ΔR^2 = .09, F(1,96) = 64.1, p < .001 - closeness = 6.37 + 0.42 affection - 4.43 genderM - 0.38 affection×genderM

8.2.2 Simple slope

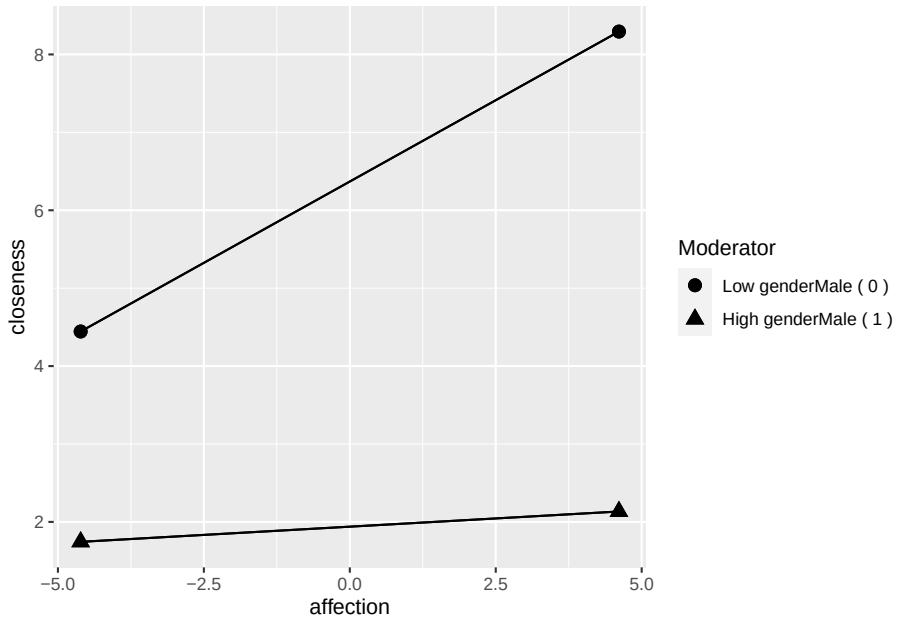
Simple slope / /

```
Sim_m1 <- simpleSlope(m1, pred="affection", mod1="genderMale", coded="genderMale")
summary(Sim_m1)
```

```
##
## ** Estimated points of closeness  **
##
##                        Low affection (-1 SD) High affection (+1 SD)
## Low genderMale ( 0 )                 4.4440                 8.2935
## High genderMale ( 1 )                1.7441                 2.1337
##
##
##
## ** Simple Slopes analysis ( df= 96 ) **
##
##                        simple slope standard error t-value p.value
## Low genderMale ( 0 )         0.4175         0.0301   13.87  <2e-16 ***
## High genderMale ( 1 )        0.0422         0.0359    1.18    0.24
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
##
## ** Bauer & Curran 95% CI **
##
##             lower CI upper CI
## genderMale    0.9366   1.3778
```

Simple Slope

```
PlotSlope(Sim_m1)
```



8.3

8.3.1

```
library(pequod)
m2 <- lmres(closeness~gender*affection, centered=c("affection"), data=cData)
summary(m2, type="nested")
```

```
## **Models**
##
## Model 1: closeness ~ genderMale + affection
## <environment: 0x00000185a59c1a58>
##
## Model 2: closeness ~ genderMale + affection + genderMale.XX.affection
## <environment: 0x00000185a59c1a58>
##
##
## **Statistics**
##
##             R     R^2   Adj. R^2   Diff.R^2    F     df1  df2    p.value
```

```
## Model 1    0.88   0.77      0.76       0.77 160.04   2.00   97 < 2.2e-16 ***
## Model 2:   0.93   0.86      0.86       0.09 197.52   3.00   96 < 2.2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## **F change**
##
##   Res.Df RSS  Df Sum of Sq    F  Pr(>F)
## 1     97 177
## 2     96 106   1        71 64.1 2.7e-12 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
## **Coefficients**
##
##                          Estimate    StdErr   t.value    beta   p.value
## -- Model 1 --
##
## (Intercept)               6.29135   0.19168  32.82144         < 2.2e-16 ***
## genderMale               -4.46269   0.27189 -16.41354 -0.8085 < 2.2e-16 ***
## affection                 0.26269   0.02963   8.86462  0.4367 < 2.2e-16 ***
##
##
## -- Model 2 --
##
## (Intercept)               6.36873   0.14950  42.60126         < 2.2e-16 ***
## genderMale               -4.42985   0.21165 -20.93042 -0.8026 < 2.2e-16 ***
## affection                 0.41746   0.03009  13.87403  0.6939 < 2.2e-16 ***
## genderMale.XX.affection  -0.37521   0.04685  -8.00877 -0.3996 < 2.2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

8.3.2 Simple slope

simple slope

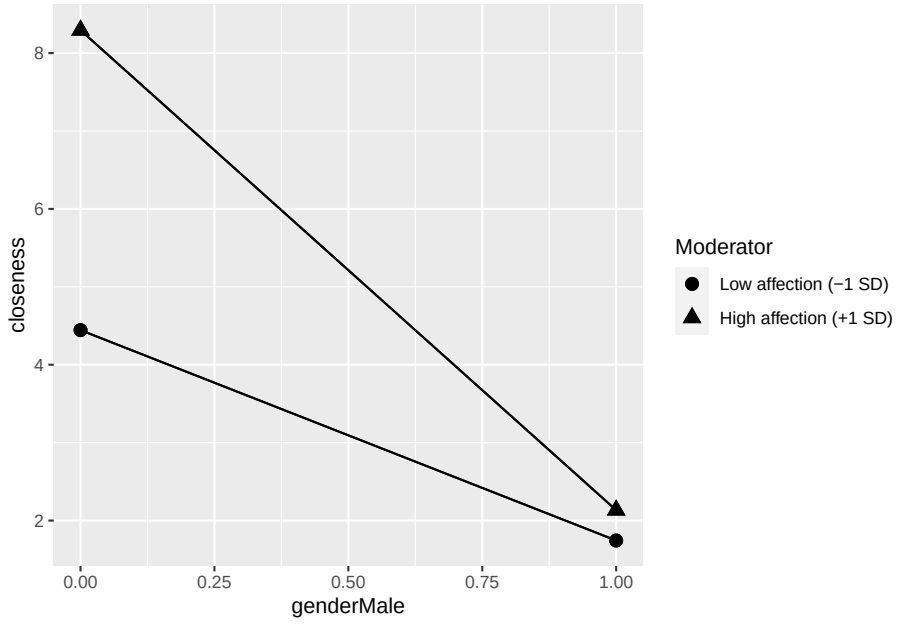
```
Sim_m2 <- simpleSlope(m1, pred="genderMale", mod1="affection", coded="genderMale")
summary(Sim_m2)
```

```
##
## ** Estimated points of closeness  **
##
```

```
##                         Low genderMale ( 0 ) High genderMale ( 1 )
## Low affection (-1 SD)                4.4440                1.7441
## High affection (+1 SD)               8.2935                2.1337
##
##
##
## ** Simple Slopes analysis ( df= 96 ) **
##
##                         simple slope standard error t-value p.value
## Low affection (-1 SD)         -2.700          0.305   -8.84  <2e-16 ***
## High affection (+1 SD)        -6.160          0.300  -20.57  <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
##
##
## ** Bauer & Curran 95% CI **
##
##           lower CI upper CI
## affection  -15.864  -9.2647
```

Simple slope

```
PlotSlope(Sim_m2)
```



8.3.3 Johnson-Neyman technique

Johnson-Neyman (JN) technique R lm()

dummy variable: genderD 1 0 dataframe gender_dummy 1

```
cData$genderD <- 1 - cData$gender_dummy
```

gender_dummy plyr revalue() Male 1 Female 0 as.numeric()

```
library(plyr)
cData$D <- as.numeric(revalue(cData$gender, c("Male"=1, 'Female'=0)))
```

(affection) affectionC

```
cData$affectionC <- c(scale(cData$affection, center=TRUE, scale=FALSE))
```

affectionC genderD closeness

```
res0 <- lm(closeness ~ affectionC + genderD, data=cData)
summary(res0)
```

```
##
## Call:
## lm(formula = closeness ~ affectionC + genderD, data = cData)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -3.3733 -0.8598  0.2029  0.8282  3.0625
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  6.29135    0.19168  32.821  < 2e-16 ***
## affectionC   0.26269    0.02963   8.865 3.78e-14 ***
## genderD     -4.46269    0.27189 -16.414  < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.351 on 97 degrees of freedom
## Multiple R-squared:  0.7674, Adjusted R-squared:  0.7626
## F-statistic:   160 on 2 and 97 DF,  p-value: < 2.2e-16
```

affectionC*genderD closeness

```
res1 <- lm(closeness ~ affectionC + genderD + affectionC*genderD, data=cData)
summary(res1)
```

```
##
## Call:
## lm(formula = closeness ~ affectionC + genderD + affectionC *
##     genderD, data = cData)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -2.18730 -0.74369 -0.06341  0.68137  2.89720
##
## Coefficients:
##                    Estimate Std. Error t value Pr(>|t|)
## (Intercept)         6.36873    0.14950  42.601  < 2e-16 ***
## affectionC          0.41746    0.03009  13.874  < 2e-16 ***
## genderD            -4.42985    0.21165 -20.930  < 2e-16 ***
## affectionC:genderD -0.37521    0.04685  -8.009 2.72e-12 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.052 on 96 degrees of freedom
## Multiple R-squared:  0.8606, Adjusted R-squared:  0.8562
## F-statistic: 197.5 on 3 and 96 DF,  p-value: < 2.2e-16
```

anova()

```
anova(res0, res1)
```

```
## Analysis of Variance Table
##
## Model 1: closeness ~ affectionC + genderD
## Model 2: closeness ~ affectionC + genderD + affectionC * genderD
##   Res.Df    RSS Df Sum of Sq     F    Pr(>F)
## 1     97 177.14
## 2     96 106.19  1    70.948 64.14 2.722e-12 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

processR processR R 4.2.0 R R 4.2.0

processR R 4.2.0 demo

modelSummary()

```
library(processR)
modelsSummary(res1)
```

modelSummary2() affection(-1SD 0 +1SD) gender(0 1) closeness

```
modSummary2(res1, rangemode=1)
```

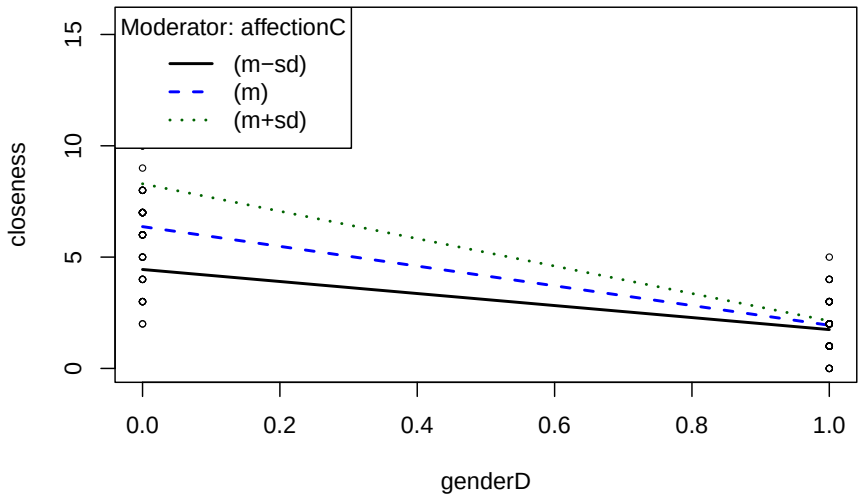
modSummary3() conditional effect affectionC 0 slope -4.43 affectionC +1 SD slope -2.70 affectionC -1 SD slope -6.16

```
modSummary3(res1, X='genderD', W='affectionC', rangemode=1)
```

8.3.3.1 rockchalk

rockchalk plotSlopes() conditional effect

```
library(rockchalk)
ps <- plotSlopes(res1, plotx="genderD", modx="affectionC", modxVals="std.dev")
```

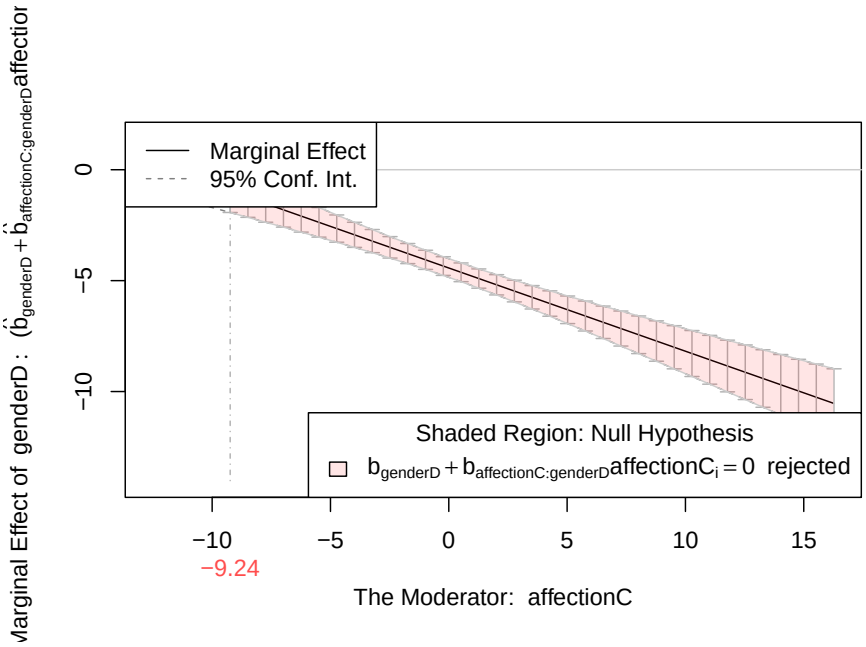


Johnson-Neyman (JN) technique: affectC conditional effect slope

```
ts <- testSlopes(ps)
```

```
## Values of affectionC OUTSIDE this interval:
##         lo         hi
## -15.931548  -9.238178
## cause the slope of (b1 + b2*affectionC)genderD to be statistically significant
```

```
plot(ts)
```

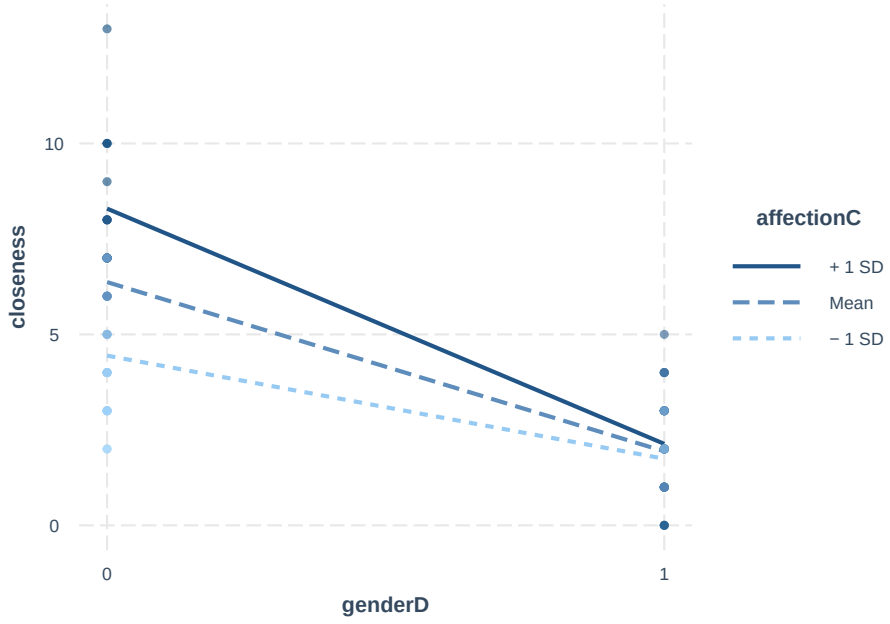


8.3.3.2 interacions

interactions conditional effect Johnson-Neyman

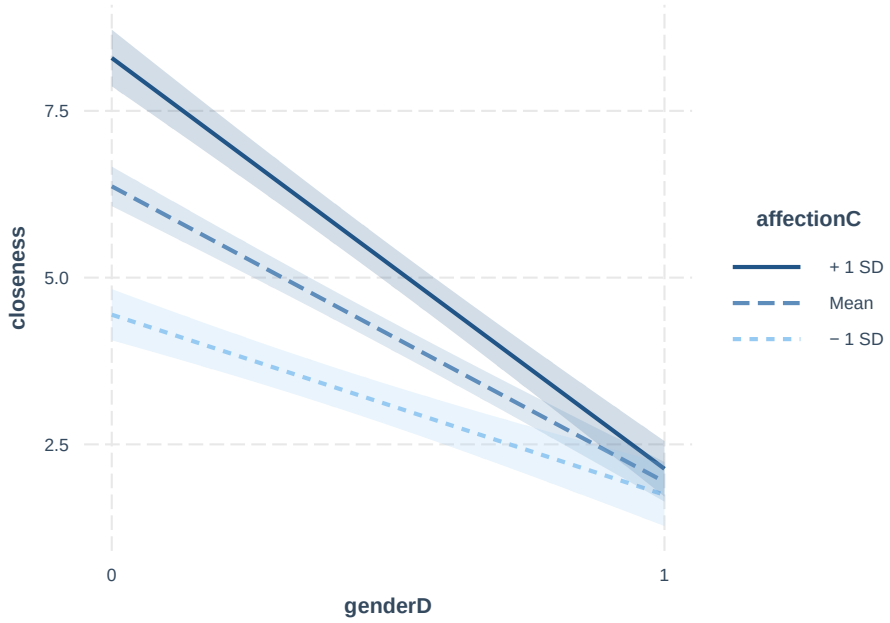
conditional effect

```
library(interactions)
interact_plot(res1, pred = genderD, modx = affectionC, plot.points = TRUE)
```



conditional effect

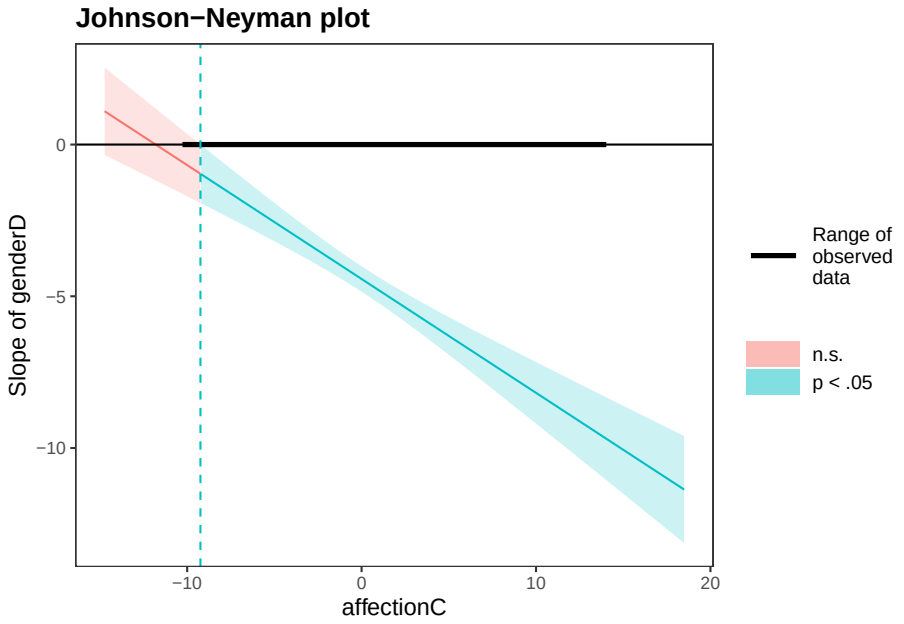
```
interact_plot(res1, pred = genderD, modx = affectionC, interval = TRUE)
```



Johnson-Neyman

```
sim_slopes(res1, pred = genderD, modx = affectionC, jnplot = TRUE)
```

```
## JOHNSON-NEYMAN INTERVAL
##
## When affectionC is OUTSIDE the interval [-15.93, -9.24], the slope of
## genderD is p < .05.
##
## Note: The range of observed values of affectionC is [-10.12, 13.88]
```



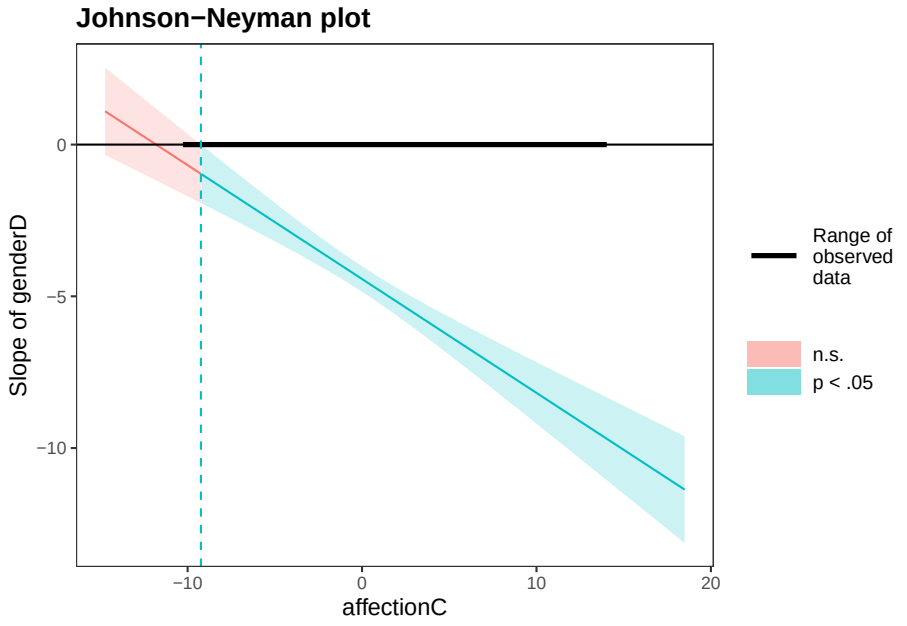

```
## SIMPLE SLOPES ANALYSIS
##
## Slope of genderD when affectionC = -4.61066e+00 (- 1 SD):
##
##    Est.   S.E.   t val.      p
## ------- ------ -------- ------
##   -2.70   0.31    -8.84   0.00
##
## Slope of genderD when affectionC =  7.81597e-16 (Mean):
##
##    Est.   S.E.   t val.      p
## ------- ------ -------- ------
##   -4.43   0.21   -20.93   0.00
##
```

```
## Slope of genderD when affectionC =  4.61066e+00 (+ 1 SD):
##
##    Est.   S.E.   t val.      p
## ------- ------ -------- ------
##   -6.16   0.30   -20.57   0.00
```

john_neyman()

```
johnson_neyman(model = res1, pred = genderD, modx = affectionC)
```

```
## JOHNSON-NEYMAN INTERVAL
##
## When affectionC is OUTSIDE the interval [-15.93, -9.24], the slope of
## genderD is p < .05.
##
## Note: The range of observed values of affectionC is [-10.12, 13.88]
```



8.3.3.3 process macro

Andrew Hayes process macro process process.R source(‘ ’) run

```
source('D:\\Dropbox\\processR\\PROCESS v4.1 for R\\process.R')
```

model process model=1 jn=1 Johnson–Neyman Technique center=2 plot=1 Data for visualizing the conditional effect of the focal predictor

```
process(data=cData,y="closeness",x="genderD",w="affection", model=1, center=2, jn=1, plot=1)
```

Chapter 9

R

9.1

JASP mediation.csv R

(laissez_faire) (independence) (exploration)

read.table()

```
mData <- read.table("mediation.csv", header=TRUE, sep=",")
```

laissez_faire	exploration	independence	disobedience
7	4	8	2
6	2	6	3
12	3	7	4
14	4	7	5
17	6	11	3
19	6	10	5

9.2 R lm

9.2.1

laissez_faire independence

```
fit <- lm(independence~laissez_faire, data=mData)
summary(fit)
```

```
##
## Call:
## lm(formula = independence ~ laissez_faire, data = mData)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -6.6202 -1.5732 -0.0493  1.4424  6.5051
##
## Coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    5.21426    0.61960   8.415 3.27e-13 ***
## laissez_faire  0.23433    0.05151   4.549 1.54e-05 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 2.363 on 98 degrees of freedom
## Multiple R-squared:  0.1744, Adjusted R-squared:  0.1659
## F-statistic:  20.7 on 1 and 98 DF,  p-value: 1.544e-05
```

9.2.2

laissez_faire exploration

```
fita <- lm(exploration ~ laissez_faire, data=mData)
summary(fita)
```

```
##
## Call:
## lm(formula = exploration ~ laissez_faire, data = mData)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -2.12610 -0.76207 -0.08926  0.60196  2.56513
##
## Coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    2.18840    0.27134   8.065 1.84e-12 ***
## laissez_faire  0.17281    0.02256   7.661 1.33e-11 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
##
## Residual standard error: 1.035 on 98 degrees of freedom
## Multiple R-squared:  0.3746, Adjusted R-squared:  0.3682
## F-statistic: 58.69 on 1 and 98 DF,  p-value: 1.333e-11
```

9.2.3

```
fitb <- lm(independence ~ exploration + laissez_faire, data=mData)
summary(fitb)
```

```
##
## Call:
## lm(formula = independence ~ exploration + laissez_faire, data = mData)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -4.1713 -0.7227 -0.0016  0.8303  2.8300
##
## Coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.84015    0.38843   2.163 0.033003 *
## exploration    1.99877    0.11211  17.829  < 2e-16 ***
## laissez_faire -0.11107    0.03165  -3.509 0.000684 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.148 on 97 degrees of freedom
## Multiple R-squared:  0.807,  Adjusted R-squared:  0.803
## F-statistic: 202.7 on 2 and 97 DF,  p-value: < 2.2e-16
```

9.2.4

stargazer stargazer()

```
library(stargazer)
stargazer(fit, fita, fitb, type = "text", title = "Baron and Kenny Method")
```

```
##
## Baron and Kenny Method
## ================================================================================================
##                                                  Dependent variable:
##                     ---------------------------------------------------------------------------
```

```
##                           independence          exploration            independence
##                               (1)                   (2)                    (3)
## ------------------------------------------------------------------------------------
## exploration                                                                1.999***
##                                                                            (0.112)
##
## laissez_faire              0.234***              0.173***                -0.111***
##                            (0.052)               (0.023)                 (0.032)
##
## Constant                   5.214***              2.188***                 0.840**
##                            (0.620)               (0.271)                 (0.388)
##
## ------------------------------------------------------------------------------------
## Observations                 100                   100                     100
## R2                          0.174                 0.375                   0.807
## Adjusted R2                 0.166                 0.368                   0.803
## Residual Std. Error    2.363 (df = 98)       1.035 (df = 98)         1.148 (df = 9
## F Statistic         20.696*** (df = 1; 98) 58.688*** (df = 1; 98) 202.746*** (df = 1
## ====================================================================================
## Note:                                                              *p<0.1; **p<0.05; ***
```

multilevel sobel() Sobel test indirect effect

```
library(multilevel)
sobel(mData$laissez_faire, mData$exploration, mData$independence)
```

```
## $`Mod1: Y~X`
##              Estimate Std. Error  t value     Pr(>|t|)
## (Intercept) 5.2142586 0.61960212 8.415495 3.267909e-13
## pred        0.2343293 0.05150847 4.549335 1.543558e-05
##
## $`Mod2: Y~X+M`
##               Estimate Std. Error   t value     Pr(>|t|)
## (Intercept)  0.8401457 0.38842542  2.162952 3.300257e-02
## pred        -0.1110699 0.03165459 -3.508809 6.841546e-04
## med          1.9987717 0.11210741 17.829078 2.255937e-32
##
## $`Mod3: M~X`
##              Estimate Std. Error  t value     Pr(>|t|)
## (Intercept) 2.1884004  0.2713435 8.065056 1.842647e-12
## pred        0.1728057  0.0225572 7.660779 1.333137e-11
##
## $Indirect.Effect
## [1] 0.3453992
##
```

```
## $SE
## [1] 0.04907255
##
## $z.value
## [1] 7.038542
##
## $N
## [1] 100
```

bda mediation.test() Sobel mediation test mv iv dv

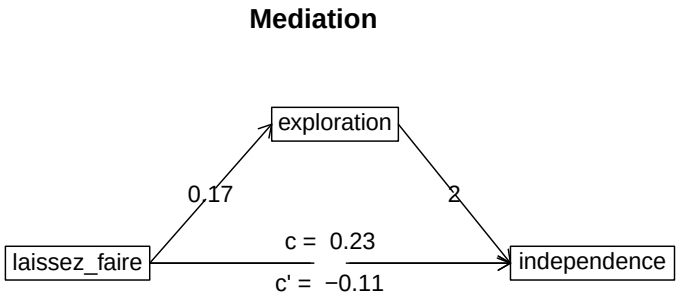
```
library(bda)
mediation.test(mData$exploration, mData$laissez_faire, mData$independence)
```

```
##                 Sobel       Aroian      Goodman
## z.value 7.038542e+00 7.029215e+00 7.047906e+00
## p.value 1.942620e-12 2.076993e-12 1.816300e-12
```

9.3 psych

psych mediate()

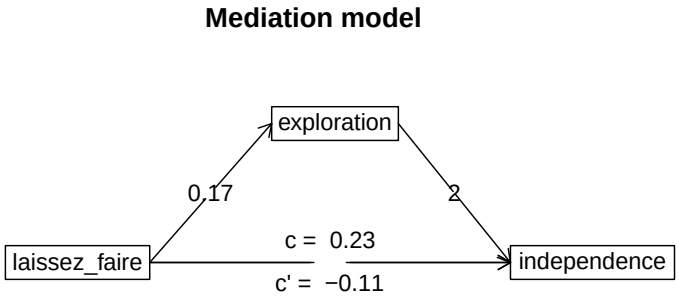
```
library(psych)
m1 <- mediate(independence ~ laissez_faire + (exploration), data=mData, n.iter = 10000)
```



```
summary(m1)
```

```
## Call: mediate(y = independence ~ laissez_faire + (exploration), data = mData,
##     n.iter = 10000)
##
## Direct effect estimates (traditional regression)    (c') X + M on Y
##               independence   se     t df     Prob
## Intercept             0.84 0.39  2.16 97 3.30e-02
## laissez_faire        -0.11 0.03 -3.51 97 6.84e-04
## exploration           2.00 0.11 17.83 97 2.26e-32
##
## R = 0.9 R2 = 0.81   F = 202.75 on 2 and 97 DF   p-value:  2.26e-35
##
##  Total effect estimates (c) (X on Y)
##               independence   se    t df     Prob
## Intercept             5.21 0.62 8.42 98 3.27e-13
## laissez_faire         0.23 0.05 4.55 98 1.54e-05
##
##  'a'  effect estimates (X on M)
##               exploration   se    t df     Prob
## Intercept            2.19 0.27 8.07 98 1.84e-12
## laissez_faire        0.17 0.02 7.66 98 1.33e-11
##
##  'b'  effect estimates (M on Y controlling for X)
##              independence   se     t df     Prob
## exploration             2 0.11 17.83 97 2.26e-32
##
##  'ab'  effect estimates (through all  mediators)
##               independence boot   sd lower upper
## laissez_faire         0.35 0.35 0.05  0.26  0.44
```

```
mediate.diagram(m1)
```



9.4 mediation

mediation

```
library(mediation)
fitM <- lm(exploration ~ laissez_faire, data=mData)
fitY <- lm(independence ~ laissez_faire + exploration, data=mData)
summary(fitM)
```

```
##
## Call:
## lm(formula = exploration ~ laissez_faire, data = mData)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -2.12610 -0.76207 -0.08926  0.60196  2.56513
##
## Coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    2.18840    0.27134   8.065 1.84e-12 ***
## laissez_faire  0.17281    0.02256   7.661 1.33e-11 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
##
## Residual standard error: 1.035 on 98 degrees of freedom
## Multiple R-squared:  0.3746, Adjusted R-squared:  0.3682
## F-statistic: 58.69 on 1 and 98 DF,  p-value: 1.333e-11
```

```
summary(fitY)
```

```
##
## Call:
## lm(formula = independence ~ laissez_faire + exploration, data = mData)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -4.1713 -0.7227 -0.0016  0.8303  2.8300
##
## Coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)    0.84015    0.38843   2.163 0.033003 *
## laissez_faire -0.11107    0.03165  -3.509 0.000684 ***
## exploration    1.99877    0.11211  17.829  < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.148 on 97 degrees of freedom
## Multiple R-squared:  0.807,  Adjusted R-squared:  0.803
## F-statistic: 202.7 on 2 and 97 DF,  p-value: < 2.2e-16
```

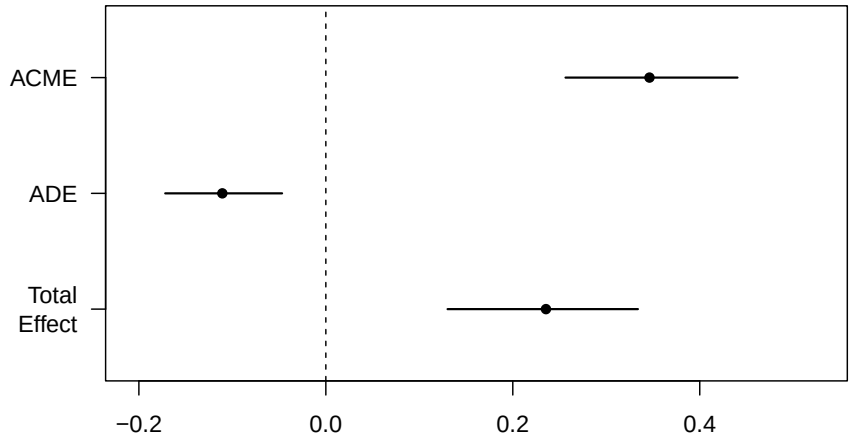
ACME Average Causal Mediation Effect (indirect effects) ADE Average Direct Effect Prop. Mediated ACME/Total Effect laissez_faire independence (b = 0.233, p < .001) exploration (b = 0.344, p < .001), laissez_faire (b = -0.111, p < .001)

```
fitMed <- mediate(fitM, fitY, treat="laissez_faire", mediator="exploration")
summary(fitMed)
```

```
##
## Causal Mediation Analysis
##
## Quasi-Bayesian Confidence Intervals
##
##                Estimate 95% CI Lower 95% CI Upper p-value
## ACME              0.346        0.256         0.44  <2e-16 ***
## ADE              -0.111       -0.172        -0.05  <2e-16 ***
## Total Effect      0.235        0.130         0.33  <2e-16 ***
```

```
## Prop. Mediated    1.480        1.163         2.10  <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Sample Size Used: 100
##
##
## Simulations: 1000
```

```
plot(fitMed)
```



9.4.1 Bootstrapping

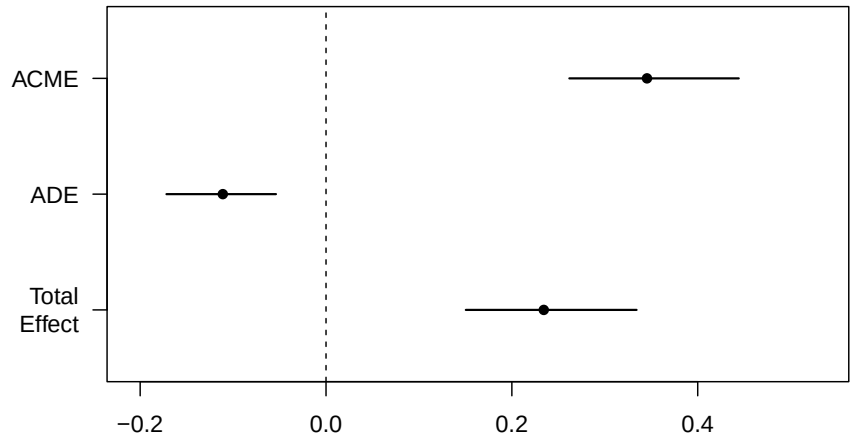
Bootstrapping

```
fitMedBoot <- mediate(fitM, fitY, boot=TRUE, sims=999, treat="laissez_faire", mediator="explorati
summary(fitMedBoot)
```

```
##
## Causal Mediation Analysis
##
```

```
## Nonparametric Bootstrap Confidence Intervals with the Percentile Method
##
##                Estimate 95% CI Lower 95% CI Upper p-value
## ACME              0.345        0.262         0.44  <2e-16 ***
## ADE              -0.111       -0.172        -0.05  <2e-16 ***
## Total Effect      0.234        0.150         0.33  <2e-16 ***
## Prop. Mediated    1.474        1.202         1.95  <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Sample Size Used: 100
##
##
## Simulations: 999
```

```
plot(fitMedBoot)
```



Chapter 10

EXCEL

R excel -

10.1

2017~2020

(TableDemo) R (Rmarkdown)

```
setwd("D:\\Dropbox\\Working\\  ")
```

10.2

readxl UG-2017.xlsx sheet 1 column name readxl suppressMessages()

```
library(readxl)
suppressMessages(qData <- read_xlsx("TableDemo\\UG-2017.xlsx", 1))
```

which()

```
index_start <- which(qData$`      `=="     ")
index_end <- length(qData$`      `)
```

```
library(dplyr)
myData <- slice(qData,index_start:index_end)
# myData <- qData[index_start:index_end,]  #
myData
```

	...2	...3	...4	...5	...6	...7	...8
	NA	NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA	NA	NA
		(5)	(4)	(3)	(2)	(1)	
1.	21	12	9	0	0	0	4.57
NA	NA	57.00%	43.00%	0%	0%	0%	NA
		(5)	(4)	(3)	(2)	(1)	
2.	21	12	7	2	0	0	4.48
NA	NA	57.00%	33.00%	10.00%	0%	0%	NA
		(5)	(4)	(3)	(2)	(1)	
5.	21	12	5	4	0	0	4.38
NA	NA	57.00%	24.00%	19.00%	0%	0%	NA
		(5)	(4)	(3)	(2)	(1)	
7.	21	12	5	4	0	0	4.38
NA	NA	57.00%	24.00%	19.00%	0%	0%	NA
		(5)	(4)	(3)	(2)	(1)	
15.	21	12	8	1	0	0	4.52
NA	NA	57.00%	38.00%	5.00%	0%	0%	NA
	NA	NA	NA	NA	NA	NA	4.47

NA

```
data1 <- na.omit(myData) # way1
## data1 <- myData[complete.cases(myData), ] #way2
## data1 <- myData[complete.cases(myData[ , 1:8]),] #way3:    data

data1
```

	...2	...3	...4	...5	...6	...7	...8
		(5)	(4)	(3)	(2)	(1)	
1.	21	12	9	0	0	0	4.57
		(5)	(4)	(3)	(2)	(1)	
2.	21	12	7	2	0	0	4.48
		(5)	(4)	(3)	(2)	(1)	
5.	21	12	5	4	0	0	4.38
		(5)	(4)	(3)	(2)	(1)	
7.	21	12	5	4	0	0	4.38
		(5)	(4)	(3)	(2)	(1)	
15.	21	12	8	1	0	0	4.52

title

```
data2 <- subset(data1, `      `!=" ", select=c(1,2,8))
data2
```

	...2	...8
1.	21	4.57
2.	21	4.48
5.	21	4.38
7.	21	4.38
15.	21	4.52

10.2.1

%>% qData tb1 (data2)

```
tb1 <- slice(qData,index_start:index_end) %>%
  na.omit() %>%
  subset(`      `!=" ", select=c(1,2,8))
```

10.2.2

anal_Teach_Q filename nSheet tb1

```
library(readxl)
library(dplyr)

anal_Teach_Q <- function(filename, nSheet){
  suppressMessages(qData <- read_xlsx(filename, nSheet))
  index_start <- which(qData$`      `=="     ")
  index_end <- length(qData$`      `)
  tb1 <- slice(qData,index_start:index_end) %>%
    na.omit() %>%
    subset(`      `!=" ", select=c(1,2,8))
  return(tb1)
}
```

anal_Teach_Q UG-2017.xlsx sheet1

```
thisfilename <- "TableDemo\\UG-2017.xlsx"
nSheet <- 1
tb1 <- anal_Teach_Q(thisfilename, nSheet)
tb1
```

	...2	...8
1.	21	4.57
2.	21	4.48
5.	21	4.38
7.	21	4.38
15.	21	4.52

10.3

```
thisfilename <- "TableDemo\\UG-2017.xlsx"
tb1 <- anal_Teach_Q(thisfilename, 1)
tb2 <- anal_Teach_Q(thisfilename, 2)
tb3 <- anal_Teach_Q(thisfilename, 3)
```

for

```
tblist <- list()
for (i in 1:3) {
  tb0 <- anal_Teach_Q(thisfilename, i)
  tblist[[i]] <- tb0
}
# tblist
```

```
tbs <- data.frame()
for (i in 1:3) {
  tb0 <- anal_Teach_Q(thisfilename, i)
  tbs <- rbind(tbs, tb0)
}
tbs
```

	...2	...8
1.	21	4.57
2.	21	4.48
5.	21	4.38
7.	21	4.38
15.	21	4.52
1.	41	4.56
2.	42	4.64
3.	42	4.5
5.	42	4.57
7.	42	4.62
8.	42	4.62
15.	42	4.57
16.	42	4.62
1.	16	4.56
2.	16	4.69
3.	16	4.63
4.	14	4.71
7.	15	4.67
8.	16	4.75
12.	16	4.56
14.	16	4.38
18.	16	4.56
19.	16	4.69
26.	16	4.63
27.	16	4.63
31.	16	4.56

tbs

```
tbs[,c(2:3)] <- lapply(tbs[,c(2:3)], as.numeric)
tbs1 <- aggregate(tbs$...8, by=list(tbs$`      `), mean)
tbs2 <- aggregate(tbs$...8, by=list(tbs$`      `), length)
tbs1
```

Group.1	x
1.	4.563333
12.	4.560000
14.	4.380000
15.	4.545000
16.	4.620000
18.	4.560000
19.	4.690000
2.	4.603333
26.	4.630000
27.	4.630000
3.	4.565000
31.	4.560000
4.	4.710000
5.	4.475000
7.	4.556667
8.	4.685000

dataframe

```
tb <- data.frame("item" = tbs1$Group.1, "n" = tbs2$x, "mean" = tbs1$x)
tb
```

item	n	mean
1.	3	4.563333
12.	1	4.560000
14.	1	4.380000
15.	2	4.545000
16.	1	4.620000
18.	1	4.560000
19.	1	4.690000
2.	3	4.603333
26.	1	4.630000
27.	1	4.630000
3.	2	4.565000
31.	1	4.560000
4.	1	4.710000
5.	2	4.475000
7.	3	4.556667
8.	2	4.685000

10.4 for

readxl excel_sheets length()

```
thisfilename <- "TableDemo\\UG-2017.xlsx"
sheetname <- excel_sheets(path = thisfilename)

tbs <- data.frame()
for (j in 1:length(sheetname)) {
  tb0 <- anal_Teach_Q(thisfilename, j)
  tbs <- rbind(tbs, tb0)
}

tbs[,c(2:3)] <- lapply(tbs[,c(2:3)], as.numeric)
tbs1 <- aggregate(tbs$...8, by=list(tbs$`      `), mean)
tbs2 <- aggregate(tbs$...8, by=list(tbs$`      `), length)
tbave <- data.frame("item" = tbs1$Group.1, "n" = tbs2$x, "mean" = tbs1$x)
tbave
```

item	n	mean
1.	12	4.578333
10.	2	4.370000
11.	2	4.215000
12.	4	4.455000
13.	7	4.480000
14.	8	4.433750
15.	7	4.464286
16.	4	4.567500
17.	3	4.486667
18.	4	4.567500
19.	4	4.437500
2.	15	4.628667
20.	1	4.130000
21.	1	4.240000
22.	2	4.155000
23.	1	3.780000
24.	1	3.870000
25.	1	3.820000
26.	4	4.435000
27.	5	4.506000
28.	4	4.397500
29.	2	4.360000
3.	11	4.631818
30.	2	4.475000
31.	2	4.270000
4.	8	4.552500
5.	7	4.525714
6.	4	4.415000
7.	8	4.553750
8.	10	4.557000
9.	2	4.120000

function

```
ave_Teach_Q <- function(filename) {
  sheetname <- excel_sheets(path = filename)
  tbs = data.frame()
  for (nSheet in 1:length(sheetname)) {
    tb0 <- anal_Teach_Q(filename, nSheet)
    tbs <- rbind(tbs, tb0)
  }
  tbs[,c(2:3)] <- lapply(tbs[,c(2:3)], as.numeric)
  tbs1 <- aggregate(tbs$...8, by=list(tbs$`      `), mean) #FUN=mean
  tbs2 <- aggregate(tbs$...8, by=list(tbs$`      `), length) #FUN=length
```

```
  tbave <- data.frame("item" = tbs1$Group.1, "n" = tbs2$x, "mean" = tbs1$x)
  return(tbave)
}
```

ave_Teach_Q

```
thisfilename <- "TableDemo\\UG-2017.xlsx"
tbave <- ave_Teach_Q(thisfilename)
tbave
```

item	n	mean
1.	12	4.578333
10.	2	4.370000
11.	2	4.215000
12.	4	4.455000
13.	7	4.480000
14.	8	4.433750
15.	7	4.464286
16.	4	4.567500
17.	3	4.486667
18.	4	4.567500
19.	4	4.437500
2.	15	4.628667
20.	1	4.130000
21.	1	4.240000
22.	2	4.155000
23.	1	3.780000
24.	1	3.870000
25.	1	3.820000
26.	4	4.435000
27.	5	4.506000
28.	4	4.397500
29.	2	4.360000
3.	11	4.631818
30.	2	4.475000
31.	2	4.270000
4.	8	4.552500
5.	7	4.525714
6.	4	4.415000
7.	8	4.553750
8.	10	4.557000
9.	2	4.120000

10.5

for

list.files()

```
path <- "D:\\Dropbox\\Working\\  \\TableDemo"
files <- list.files(path = path, pattern = "*.xlsx")
# files
```

```
tblist = list()
for (i in 1:length(files)) {
  thisfilename <- paste("TableDemo\\", files[i], sep='')
  tb <- ave_Teach_Q(thisfilename)
  tblist[[i]] <- tb
}

# tblist
```

mean

```
path <- "D:\\Dropbox\\Working\\  \\TableDemo"
files <- list.files(path = path, pattern = "*.xlsx")

tblist = list()
for (i in 1:length(files)) {
  thisfilename <- paste("TableDemo\\", files[i], sep='')
  tb <- ave_Teach_Q(thisfilename)
  tb2 <- as.data.frame(tb[,c(1,3)])
  names(tb2) <- c('item', substr(thisfilename,4,7))
  tblist[[i]] <- tb2
}

# tblist
```

```
tbAll <- Reduce(function(x, y) merge(x, y, all=TRUE, by="item"), tblist)
```

```
## Warning in merge.data.frame(x, y, all = TRUE, by = "item"): column names
## 'leDe.x', 'leDe.y' are duplicated in the result
```

```
tbAll[,2:ncol(tbAll)] <- round(tbAll[,2:ncol(tbAll)], digits = 2)
tbAll
```

item	leDe.x	leDe.y	leDe.x	leDe.y
1.	4.58	4.72	4.63	4.73
10.	4.37	NA	3.80	4.58
11.	4.22	NA	3.71	4.17
12.	4.46	NA	4.30	4.50
13.	4.48	4.60	4.04	4.30
14.	4.43	4.54	4.50	4.70
15.	4.46	4.61	4.52	4.73
16.	4.57	4.54	4.53	4.61
17.	4.49	4.60	4.38	4.66
18.	4.57	4.68	4.66	4.74
19.	4.44	4.66	4.48	4.61
2.	4.63	4.73	4.62	4.74
20.	4.13	4.61	3.82	4.54
21.	4.24	4.60	4.52	4.70
22.	4.15	NA	4.26	4.52
23.	3.78	NA	3.53	4.38
24.	3.87	NA	3.60	4.39
25.	3.82	4.58	4.24	4.69
26.	4.44	4.58	4.57	4.64
27.	4.51	4.61	4.29	4.54
28.	4.40	NA	4.34	4.50
29.	4.36	NA	4.31	4.30
3.	4.63	4.66	4.54	4.75
30.	4.47	4.56	4.42	4.66
31.	4.27	NA	3.64	4.61
4.	4.55	4.58	4.50	4.72
5.	4.53	4.80	4.56	4.72
6.	4.42	4.65	4.45	4.65
7.	4.55	4.68	4.43	4.71
8.	4.56	4.68	4.57	4.72
9.	4.12	NA	3.62	4.35

tidyverse package purr dplyr package full_join() Reduce()

```
library("tidyverse")
tbAll2 <- reduce(tblist, full_join, by = "item")
# tbAll2
```

lapply for

```
setwd("D:\\Dropbox\\Working\\  \\TableDemo")
all.data <-
  lapply(files[1:length(files)], function(x)
    ave_Teach_Q(x) %>%
    subset(select = c(1,3)) %>%
    rename(, !!substr(x,4,7) := mean))

tbAll2 <- Reduce(function(x, y) merge(x, y, all=TRUE, by="item"), all.data) %>%
  mutate_if(is.numeric, round, digits = 2)

# tbAll2
```

tbAll excel

```
library(writexl)
write_xlsx(tbAll, "    .xlsx")
```

10.6

```
setwd("D:\\pCloud\\Working\\  \\TableDemo")

library(writexl)
library(readxl)
library(dplyr)

path <- "D:\\pCloud\\Working\\  \\TableDemo"
files <- list.files(path = path, pattern = "*.xlsx")

anal_Teach_Q <- function(filename, nSheet){
  suppressMessages(qData <- read_xlsx(filename, nSheet))
  index_start <- which(qData$`      `=="     ")
  index_end <- length(qData$`      `)
  tb1 <- slice(qData,index_start:index_end) %>%
    na.omit() %>%
    subset(`      `!=" ", select=c(1,2,8))
  return(tb1)
}

ave_Teach_Q <- function(filename) {
  sheetname <- excel_sheets(path = filename)
  tbs <- data.frame()
  for (nSheet in 1:length(sheetname)) {
```

```
    tb0 <- anal_Teach_Q(filename, nSheet)
    tbs <- rbind(tbs, tb0)
  }
  tbs[,c(2:3)] <- lapply(tbs[,c(2:3)], as.numeric)
  tbs1 <- aggregate(tbs$...8, by=list(tbs$`      `), mean) #FUN=mean
  tbs2 <- aggregate(tbs$...8, by=list(tbs$`      `), length) #FUN=length
  tbave <- data.frame("item" = tbs1$Group.1, "n" = tbs2$x, "mean" = tbs1$x)
  return(tbave)
}

tblist <- list()
for (i in 1:length(files)) {
  thisfilename <- files[i]
  tb <- ave_Teach_Q(thisfilename)
  tb2 <- tb[,c(1,3)]
  names(tb2)[2] <- substr(thisfilename,4,7)
  tblist[[i]] <- tb2
}

tbAll <- Reduce(function(x, y) merge(x, y, all=TRUE, by="item"), tblist)
```

%>% funcion

```
library(readxl)
library(writexl)
library(dplyr)

setwd("D:\\pCloud\\Working\\  \\TableDemo")
path <- "D:\\pCloud\\Working\\  \\TableDemo"

files <- list.files(path = path, pattern = "*.xlsx")
datalist <- list()
for (i in 1:length(files)) {
  thisfilename <- files[i]
  sheetname <- excel_sheets(path = thisfilename)
  tbs <- data.frame()
  for (j in 1:length(sheetname)) {
    suppressMessages(qData <- read_xlsx(thisfilename, j))
    index_start <- which(qData$`      `=="     ")
    index_end <- length(qData$`      `)
    myData <- slice(qData,index_start:index_end)
    myData1 <- na.omit(myData)
    myData2 <- myData1[which(myData1$`      `!=" "),]
    myData2 <- myData2[,c(1,2,8)]
    tbs <- rbind(tbs, myData2)
```

```
  }
  tbs[,c(2:3)] <- lapply(tbs[,c(2:3)], as.numeric)
  tbs1 <- aggregate(tbs$...8, by=list(tbs$`      `), mean)
  tbs2 <- aggregate(tbs$...8, by=list(tbs$`      `), length)
  tb <- data.frame("item" = tbs1$Group.1, "n" = tbs2$x, "mean" = tbs1$x)
  tb2 <- tb[,c(1,3)]
  names(tb2)[2] <- substr(thisfilename,4,7)
  datalist[[i]] <- tb2
}

tbAll <- Reduce(function(x, y) merge(x, y, all=TRUE, by="item"), datalist)
```