```
source("SETUP.R")
options(width = 70)
knitr::opts_chunk$set(tidy = FALSE, echo = TRUE,
    cache = FALSE, fig.keep = "high", fig.show = "asis",
    results = "asis", autodep = T, Rplot = TRUE,
    dev = "pdf", fig.path = "graphics/reuters/rplot_",
    fig.width = 7, fig.asp = 1, out.width = "\\linewidth")
library(foreign)  ## read.spss() ##
```

Three-Way Contingency Table Analysis

```r
cnt <- array( ## What we want to generate directly from the data ##
    c(100, 139, 106, 128, 157, 140, 89, 77),
    dim = c(2, 2, 2),
    dimnames = list(
    sex = c("Male", "Female"),
    ind = c("Affiliate", "Independent"),
    response = c("Clinton", "Trump")
))
library(DescTools)
## what the results of the BD & MH tests should be: ##
BreslowDayTest(cnt, correct = FALSE)
```

Table 1: Breslow-Day test on Homogeneity of Odds Ratios: cnt

Test statistic	df	P value
0.1691	1	0.6809

```r
mantelhaen.test(cnt, correct = TRUE) ## For comparison only, since JTN's handout
```

Table 2: Mantel-Haenszel chi-squared test with continuity correction: cnt

Test statistic	df	P value	Alternative hypothesis
0.346	1	0.5564	two.sided

```r
                                ## uses the default MH test method, which
                                ## includes Yate's correction ##
mantelhaen.test(cnt, correct = FALSE)
```

Table 3: Mantel-Haenszel chi-squared test without continuity correction: `cnt`

Test statistic	df	P value	Alternative hypothesis
0.4293	1	0.5123	two.sided

```
dat <- R.rspss("data/cnnpoll.sav", vlabs = T)
ft <- with(dat, {
    ftable(dat, row.vars = 1:2, col.vars = 3)
})
ft
```

		"ind"	"party affiliate"	"independent"
"response"	"sex"			
"CLINTON"	"MALE"		100	106
	"FEMALE"		157	89
"TRUMP"	"MALE"		139	128
	"FEMALE"		140	77

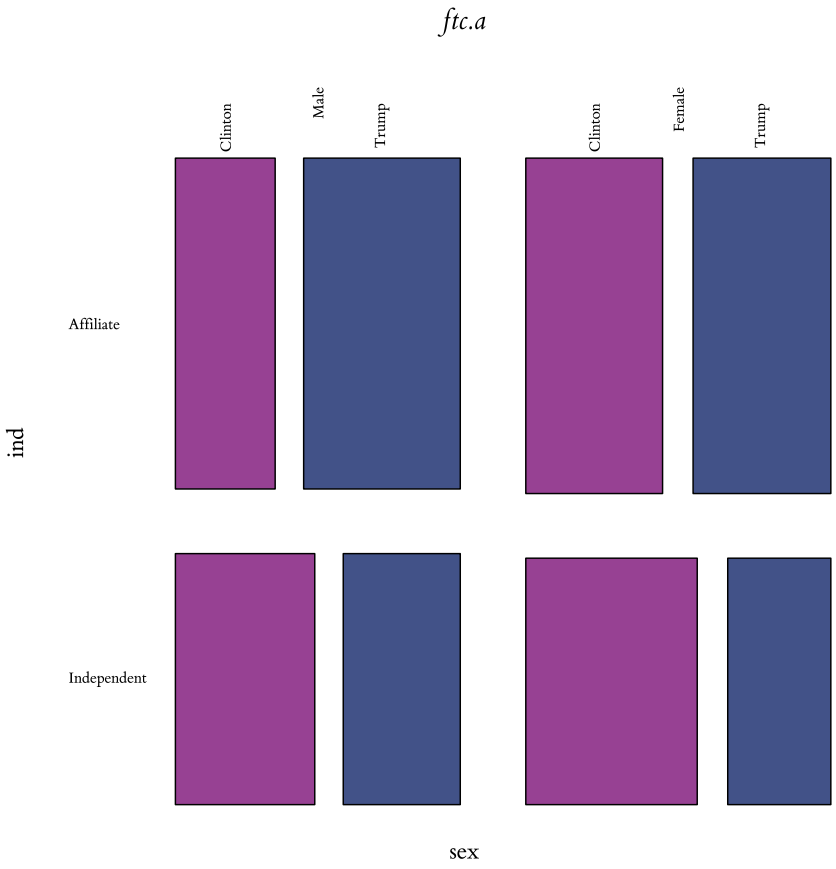
```
ftc <- matrix(ft, nrow = 4, byrow = T)
ftc
```

100	157
139	140
106	89
128	77

```
ftc.a <- array(ftc, dim = c(2, 2, 2), dimnames = list(
    sex = c("Male", "Female"),
    ind = c("Affiliate", "Independent"),
    response = c("Clinton", "Trump")))
ftc.a
```

100, *139*, *106*, *128*, *157*, *140*, *89* and *77*

```
mosaicplot(ftc.a, type = "deviance", las = 2, color = mypal.a75[c(5, 16)])
```




```
library(DescTools)
BreslowDayTest(ftc.a, correct = FALSE)
```

Table 6: Breslow-Day test on Homogeneity of Odds Ratios: `ftc.a`

Test statistic	df	P value
0.1691	1	0.6809

```
mantelhaen.test(ftc.a, correct = TRUE) ## For comparison only, since JTN's handout
```

Table 7: Mantel-Haenszel chi-squared test with continuity correction: `ftc.a`

Test statistic	df	P value	Alternative hypothesis
0.346	1	0.5564	two.sided

```
                                    ## uses the default MH test method, which
                                    ## includes Yate's correction ##
mantelhaen.test(ftc.a, correct = FALSE)
```

Table 8: Mantel-Haenszel chi-squared test without continuity correction: `ftc.a`

Test statistic	df	P value	Alternative hypothesis
0.4293	1	0.5123	two.sided

Matched Pairs

```
cnt <- array( ## What we want to generate directly from the data ##
    c(146, 155, 47, 303),
    dim = c(2, 2),
    dimnames = list(w1dep = c("not", "depressed"),
                    w2dep = c("not", "depressed"))
    )
cnt
```

	not	depressed
not	146	47
depressed	155	303

```
## What the results of the McNemar's Test should be: ##
mcnemar.test(cnt, correct = FALSE)
```

Table 10: McNemar's Chi-squared test: `cnt`

Test statistic	df	P value
57.74	1	2.988e-14 * * *

```
dat <- read.spss("data/dep.sav", to.data.frame = T)
sapply(dat, R.isna) ## THANK YOU!!!! (no NAs to deal with) ##
```

w1dep	w2dep	w3dep
0	0	0

```
#   ## ... except the factor labels are kind of obnoxious for output... ##
dat <- within(dat, {
    levels(w1dep) <- c("not", "depressed")
    levels(w2dep) <- c("not", "depressed")
})
names(dat) <- c("T1", "T2", "T3")

ft <- with(dat, {
```

```
    ftable(dat, row.vars = 1, col.vars = 2)
})
ft
```

	"T2"	"not"	"depressed"
"T1"			
"not"		146	155
"depressed"		47	303

```
ftc <- matrix(ft, nrow = 2, byrow = T)
ftc
```

146	47
155	303

```
ftc.a <- array(ftc, dim = c(2, 2), dimnames = list(
    T1 = c("not", "depressed"),
    T2 = c("not", "depressed")))
ftc.a
```

	not	depressed
not	146	47
depressed	155	303

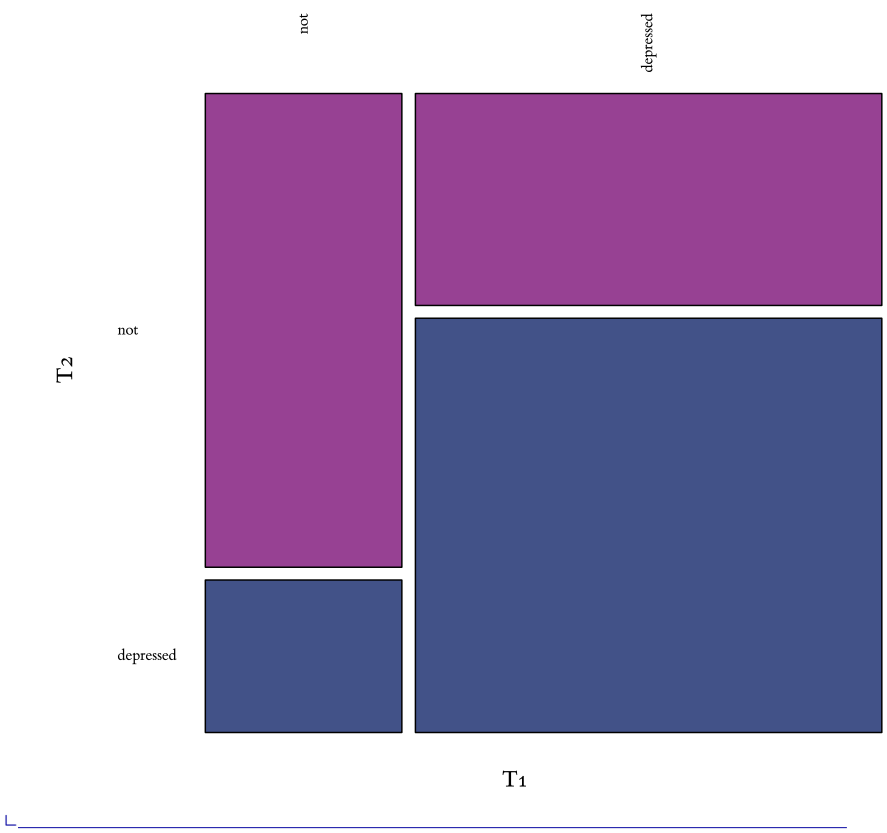
```
mcnemar.test(ftc.a, correct = FALSE)
```

Table 15: McNemar's Chi-squared test: `ftc.a`

Test statistic	df	P value
57.74	1	2.988e-14 * * *

```
mosaicplot(ftc.a, type = "deviance", las = 2, color = mypal.a75[c(5, 16)])
```

ftc.a



```
dat <- R.rspss("data/reuters.sav", vlabs = F)
R.msmm(dat)
```

	M	SD	Min	Max	NAs
id	769.5	444.1	1	1538	0
response	0.84	0.73	0	2	0
party	0.42	0.49	0	1	377
partmiss	0.25	0.43	0	1	0
ind	0.14	0.35	0	1	0

```
dat <- dat[, -3]
dat <- subset(dat, response < 2)
dat <- within(dat, {
    ind.f <- factor(ind,
                    levels = unique(ind),
                    labels = c("Independent",
                               "Affililate"))
    response.f <- factor(response,
                         levels = c(0, 1),
                         labels = c("Trump",
                                    "Clinton"))
})
summary(dat)
```

Table 17: Table continues below

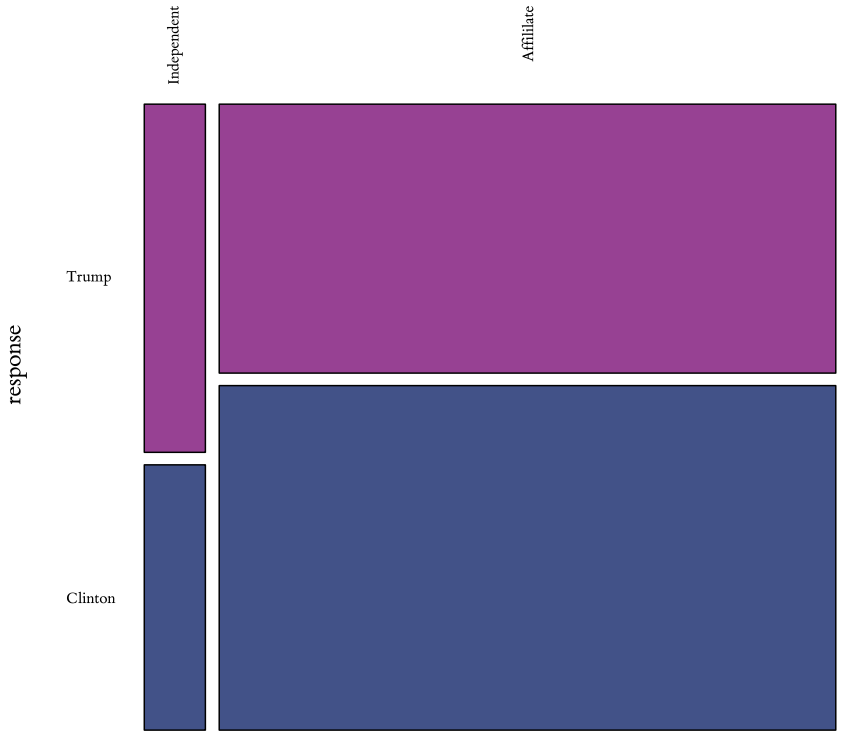
id	response	partmiss	ind	response.f
Min. : 1	Min. :0.00	Min. :0.0000	Min. :0.0000	Trump :554
1st Qu.: 308	1st Qu.:0.00	1st Qu.:0.0000	1st Qu.:0.0000	Clinton:677
Median : 616	Median :1.00	Median :0.0000	Median :0.0000	
Mean : 616	Mean :0.55	Mean :0.0569	Mean :0.0902	
3rd Qu.: 924	3rd Qu.:1.00	3rd Qu.:0.0000	3rd Qu.:0.0000	

id	response	partmiss	ind	response.f
Max. :1231	Max. :1.00	Max. :1.0000	Max. :1.0000	

ind.f
Independent: 111
Affililate :1120

```
tbl <- table(dat$ind.f, dat$response.f)
dimnames(tbl) <- list(ind = levels(dat$ind.f), response = levels(dat$response.f))
mosaicplot(tbl, type = "deviance", las = 2, color = mypal.a75[c(5, 16)])
```

tbl




```
library(MASS)
logmodel <- loglm( ~ ind + response, digits = 4, data = tbl)
```

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[1] **Note:** This document was created using ***R**-v3.3.2* R Core Team, *R*, and the following ***R**-packages*: *base-v3.3.* R Core Team, *R*, *bibtex-v0.4.* Francois, *Bibtex*, *dplyr-v0.5.* Wickham and Francois, *Dplyr*, *DT-v0.2.* Xie, *DT*, *extrafont-v0.17.* Chang, *Extrafont*, *ggplot2-v2.1.* Wickham, *Ggplot2*, *knitcitations-v1.0.* Boettiger, *knitcitations*, *knitr-v1.14.* Xie, *Dynamic Documents with R and Knitr*, *pander-v0.6.* Daroczi and Tsegelskyi, *Pander*, *papaja-v0.1.* Aust and Barth, *Papaja*, *plyr-v1.8.* Wickham, "The Split-Apply-Combine Strategy for Data Analysis.", *rmarkdown-v1.1.* Allaire et al., *rmarkdown*, *scales-v0.4.* Wickham, *Scales*, *tidyr-v0.6.* Wickham, *Tidyr*, *ggthemes-v3.2.* Arnold, *Ggthemes*, *gtable-v0.2.* Wickham, *Gtable*, *kableExtra-v0.0.* Zhu, *KableExtra*, *tufte-v0.2.* Xie and Allaire, *Tufte*, *MASS-v7.3.* Venables and Ripley, *Modern Applied Statistics with S*, *devtools-v1.12.* Wickham and Chang, *Devtools*, *highlight-v0.4.* Francois, *Highlight*, *sysfonts-v0.5.* Qiu and others, *Sysfonts*, and *showtext-v0.4.* Qiu, *Showtext*

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