Three-Way Contingency Table Analysis

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```
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

```
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

```
                                ## 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(
    Gender = c("Male", "Female"),
    Independence = c("Affiliate", "Independent"),
    Response = c("Clinton", "Trump")))
ftc.a[,,"Clinton"]
```

	Affiliate	Independent
Male	100	106
Female	139	128

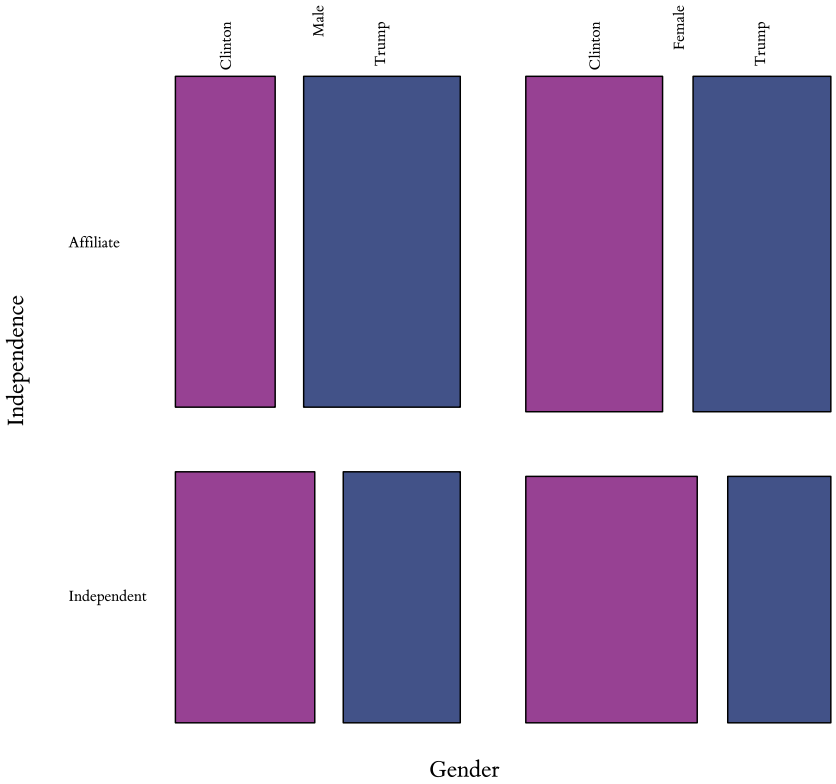
```
format(ftc.a[,,"Trump"])
```

	Affiliate	Independent
Male	157	89
Female	140	77

```
mosaicplot(ftc.a, type = "deviance", las = 2,
           color = mypal.a75[c(5, 16)],
           main = "Visual 2-x-2-x-2 Cross-Tabulation:\n
           Party Affiliate-x-Gender-x-Response")
```

Visual 2-x-2-x-2 Cross-Tabulation:

Party Affiliate-x-Gender-x-Response




```
str(BreslowDayTest(ftc.a, correct = FALSE))
```

List of 5
$ statistic: Named num 0.169
..- attr(*, "names")= chr "X-squared"
$ parameter: Named num 1
..- attr(, "names")= chr "df"*
$ p.value : num 0.681
$ method : chr "Breslow-Day test on Homogeneity of Odds Ratios"

$ data.name: chr “ftc.a”
- attr(*, “class”)= chr “htest”

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

Table 8: 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 9: Mantel-Haenszel chi-squared test without continuity correction: `ftc.a`

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

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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*, *car-v2.1.* Fox and Weisberg, *An R Companion to Applied Regression*, *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*, *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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