

Matched Pairs Analysis

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Data: *data/dep.sav*

$$\text{McNemar's } \chi^2 = \frac{(n_{21} - n_{12})^2}{n_{21} + n_{12}}$$

R

```
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 2: 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)

```

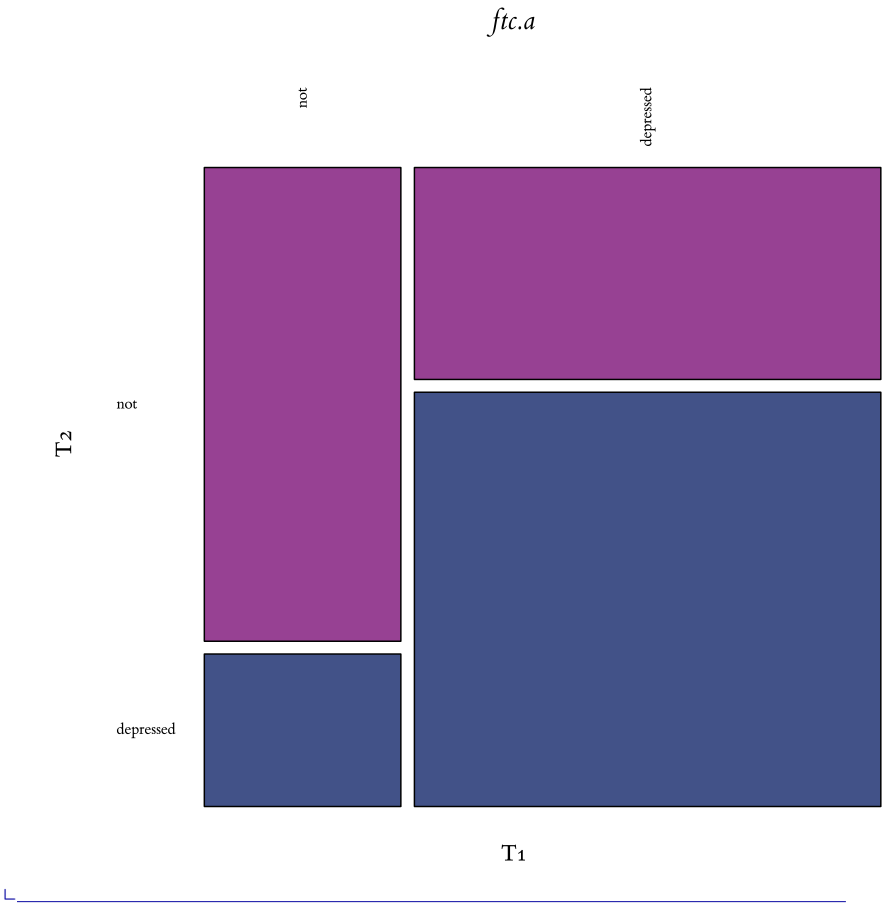
Table 7: McNemar's Chi-squared test: ftc.a

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

```

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

```



References¹

Allaire, JJ, Joe Cheng, Yihui Xie, Jonathan McPherson, Winston Chang, Jeff Allen, Hadley Wickham, Aron Atkins, and Rob Hyndman. *rmarkdown: Dynamic Documents for R*, 2016. <https://CRAN.R-project.org/package=rmarkdown>.

Arnold, Jeffrey B. *Ggthemes: Extra Themes, Scales and Geoms for Ggplot2*, 2016. <https://CRAN.R-project.org/package=ggthemes>.

Aust, Frederik, and Marius Barth. *Papaja: Create APA Manuscripts with RMarkdown*, 2015. <https://github.com/crsh/papaja>.

Boettiger, Carl. *knitcitations: Citations for Knitr Markdown Files*, 2015. <https://CRAN.R-project.org/package=knitcitations>.

Chang, Winston. *Extrafont: Tools for Using Fonts*, 2014. <https://CRAN.R-project.org/package=extrafont>.

Daroczi, Gergely, and Roman Tsegelskyi. *Pander: An R Pandoc Writer*, 2015. <https://CRAN.R-project.org/package=pander>.

Fox, John, and Sanford Weisberg. *An R Companion to Applied Regression*. Second. Thousand Oaks CA: Sage, 2011. <http://socserv.socsci.mcmaster.ca/jfox/Books/Companion>.

Francois, Romain. *Bibtex: Bibtex Parser*, 2014. <https://CRAN.R-project.org/package=bibtex>.

———. *Highlight: Syntax Highlighter*, 2015. <https://CRAN.R-project.org/package=highlight>.

Qiu, Yixuan. *Showtext: Using Fonts More Easily in RGraphs*, 2015. <https://CRAN.R-project.org/package=showtext>.

Qiu, Yixuan, and others. *Sysfonts: Loading System Fonts into R*, 2015. <https://CRAN.R-project.org/package=sysfonts>.

R Core Team. *R: A Language and Environment for Statistical Computing*. Vienna, Austria: R Foundation for Statistical Computing, 2016. <https://www.R-project.org/>.

Wickham, Hadley. *Ggplot2: Elegant Graphics for Data Analysis*. Springer-Verlag New York, 2009. <http://ggplot2.org>.

———. *Gtable: Arrange Grobs in Tables*, 2016. <https://CRAN.R-project.org/package=gtable>.

———. *Scales: Scale Functions for Visualization*, 2016. <https://CRAN.R-project.org/package=scales>.

———. “The Split-Apply-Combine Strategy for Data Analysis.” *Journal of Statistical Software* 40, no. 1 (2011): 1–29. <http://www.jstatsoft.org/v40/i01/>.

———. *Tidyr: Easily Tidy Data with Spread() and Gather() Functions*, 2016. <https://CRAN.R-project.org/package=tidyr>.

Wickham, Hadley, and Winston Chang. *Devtools: Tools to Make Developing R Packages Easier*, 2016. <https://CRAN.R-project.org/>

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*, *tuftes-v0.2*. Xie and Allaire, *Tufts*, *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*

package=devtools.

Wickham, Hadley, and Romain Francois. *Dplyr: A Grammar of Data Manipulation*, 2015. <https://CRAN.R-project.org/package=dplyr>.

Xie, Yihui. *DT: A Wrapper of the Javascript Library Datatables*, 2015. <https://CRAN.R-project.org/package=DT>.

———. *Dynamic Documents with R and Knitr*. 2nd ed. Boca Raton, Florida: Chapman; Hall/CRC, 2015. <http://yihui.name/knitr/>.

Xie, Yihui, and JJ Allaire. *Tufte: Tufte's Styles for Rmarkdown Documents*, 2016. <https://CRAN.R-project.org/package=tufte>.

Zhu, Hao. *KableExtra: Decorate Kable Output Using Pipe Syntax*, 2016. <https://github.com/haozhu233/kableExtra>.