

R HELP SHEET: Two-Way Chi-Square (from data as raw observations)

This help sheet covers doing a two-way chi-square starting with data which are raw observations. There is a separate help sheet for doing a two-way chi-square starting with data where frequencies have already been generated from raw observations.

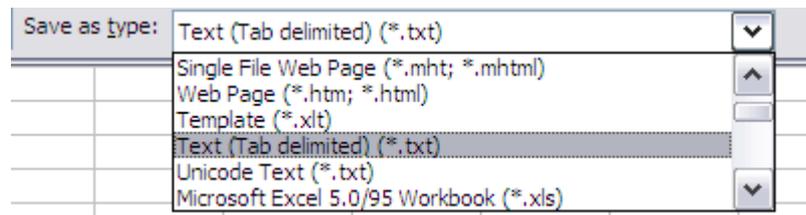
CONTENTS

1. Creating a tab delimited data file using Excel
2. Conducting a two-way chi-square test
3. Identifying the key elements of the output
4. Additional notes

1. Creating a tab delimited data file using Excel

Open Excel and type data from your variables into two columns with appropriate headings (e.g., *grp.type*, *season*), then save the file as a **Text (Table delimited)(*.txt)** with an appropriate name (e.g., *RData_Elephants*) file using **Save as type**. Note use full stops rather than spaces in data categories, this would also apply to column and row headings.

	A	B
1	grptype	season
2	Solitary.Bull	Dry
3	Solitary.Bull	Dry
4	Solitary.Bull	Dry
5	Solitary.Bull	Dry
6	Solitary.Bull	Dry
7	Solitary.Bull	Dry
8	Solitary.Bull	Dry
559	Family.Group.with.Bull(s)	Wet
560	Family.Group.with.Bull(s)	Wet
561	Family.Group.with.Bull(s)	Wet
562	Family.Group.with.Bull(s)	Wet
563	Family.Group.with.Bull(s)	Wet



2. Conducting a two-way chi-square test

The text in green after the hash (#) sign is just **notes** to help you remember what's in the output: it does not get R to actually "do" anything. The text in blue is **R code** with stars representing words that are specific to the example: you need to replace this with text specific to your data as shown in the output in section 3.

To get R to conduct a two-way chi-square test:

Open an **R-Editor** window by selecting **File** then **New script**.

Type in (or copy and paste) the notes and code below.

Replace the stars with appropriate text as indicated in notes.

Highlight everything and press **Ctrl R**.

#Importing data from tab delimited file

***(replace stars with an appropriate object name e.g., eles)**

```
****<-read.table(file.choose(),header=TRUE)
```

```
attach(****)
```

```
names(****)
```

#Conducting a two-way chi-square

***(replace stars with appropriate text e.g., grptype,season,grptype)**

```
chisq.test(tapply(*****,list(****, *****),length))
```

3. Identifying the key elements of the output

Following the instructions above will produce the following output in the **R Console** window: the **key elements** are annotated in blue.

```
> #Importing data from tab delimited file (replace stars with an appropriate object name e.g.,ele.hab)
> eles<-read.table(file.choose(),header=TRUE)
> attach(eles)
> names(eles)
[1] "grptype" "season"

> #Conducting a two-way chi-square (replace stars with appropriate text e.g., grptype,season,grptype)
> chisq.test(tapply(grptype,list(season,grptype),length))

Pearson's Chi-squared test

data: tapply(grptype, list(season, grptype), length)
X-squared = 19.297, df = 3, p-value = 0.0002373
```

Statistic **Degrees of Freedom** **P Value**

In summary the key information from the test is

two-way classification chi-square: $X^2_3 = 19.30$, $N = 562$, $P < 0.001$

4. Additional notes

a. To find total sample size (N) use the following code:

```
#To find sample size
```

```
length(*****)
```

For example: `length(season)`

b. To find the observed frequencies use the following code:

```
#Calculating observed frequencies
```

```
 #(replace stars with appropriate text e.g., grptype,season,grptype)
```

```
tapply(*****,list(*****,*****),length)
```

For example: `tapply(grptype,list(season,grptype),length)`