t-Tests

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First Commands

```
> library(NCStats)
> library(car)    # for leveneTest
```

Two-Sample t-Test

Sholl *et al.* (2000) performed an experiment to test the effect of sex (male, female) on spatial orientation ability. In one part of their study, the researchers took 30 males and 30 females to an unfamiliar wooded park and asked each individual to point to the south. The absolute pointing error (positive degrees off from due south, `abserr`) was recorded in SexDirection.csv . Test if men have a better sense of direction than women, at the 1% level?

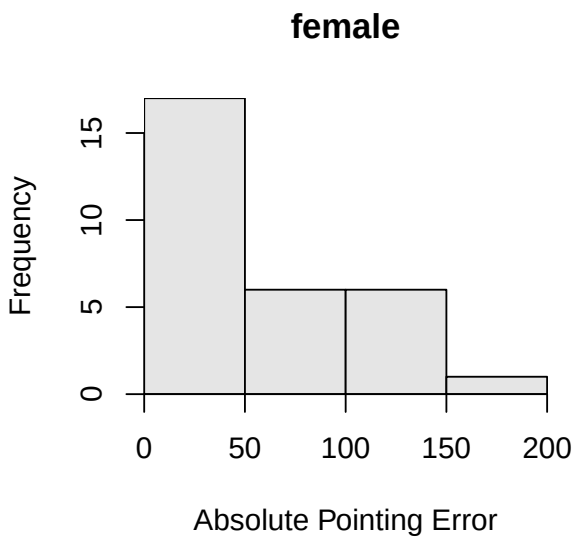
```
> setwd("C:/aaaWork/Web/GitHub/NCMTH107/modules/1_Sample_t")
> sdir <- read.csv("SexDirection.csv")
> str(sdir)
```

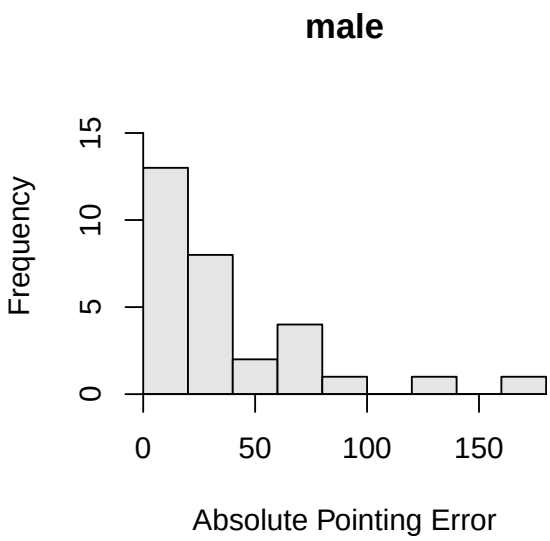
```
'data.frame':   60 obs. of  2 variables:
 $ abserr: int  13 13 38 59 58 8 130 68 23 5 ...
 $ sex   : Factor w/ 2 levels "female","male": 2 2 2 2 2 2 2 2 2 2 ...
```

```
> Summarize(abserr~sex,data=sdir,digits=1)
```

```
     sex  n nvalid mean   sd min   Q1 median   Q3 max percZero
1 female 30     30 55.8 48.3   3 15.8   35.0 88.2 176        0
2   male 30     30 37.6 38.5   3 11.5   22.5 58.8 167        0
```

```
> hist(abserr~sex,data=sdir,xlab="Absolute Pointing Error")
```





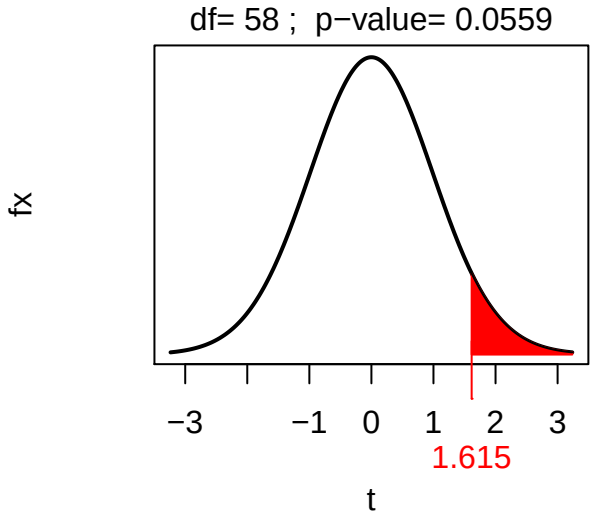

```
> leveneTest(abserr~sex,data=sdir)
```

```
Levene's Test for Homogeneity of Variance (center = median)
      Df F value Pr(>F)
group  1  2.1692 0.1462
      58
```

```
> ( t2 <- t.test(abserr~sex,data=sdir,var.equal=TRUE,alt="greater",conf.level=0.99) )
```

```
 Two Sample t-test with abserr by sex
t = 1.6149, df = 58, p-value = 0.05588
alternative hypothesis: true difference in means is greater than 0
99 percent confidence interval:
 -8.761457       Inf
sample estimates:
mean in group female   mean in group male
                55.8                 37.6
```

```
> plot(t2)
```


df= 58 ; p−value= 0.0559
fx
−3
−1
0
1
2
3
1.615
t