

t-Tests

R Handout

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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?

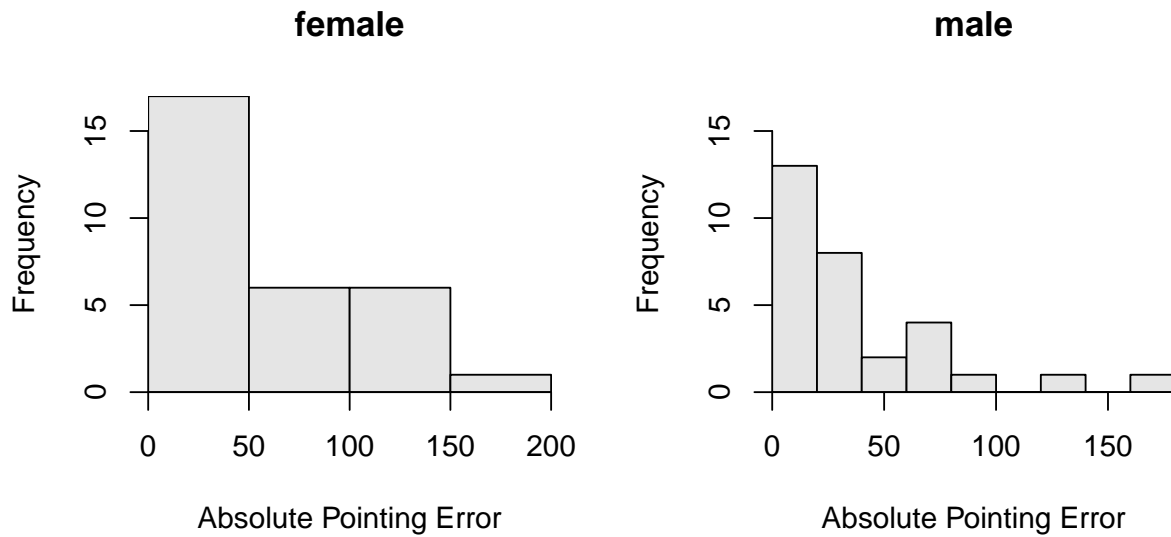
```
> setwd("C:/aaaWork/Web/GitHub/NCMTH107/modules/2_Sample_t")
> sdir <- read.csv("SexDirection.csv")
> str(sdir)
```

```
'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)

group	Df	F value	Pr(>F)
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)
```

