R TUTORIAL:

PAIRED SAMPLES *t* & WILCOXON SIGNED RANKS TESTS

Frances Chumney, PhD

parametric analysis for within-subjects designs

PAIRED SAMPLES *t* TEST

COMPARE MEANS

Conduct a test to compare the means of two variables within a data file.

Example Syntax

```
t.test(dataTABLE$VARIABLE,dataTABLE$VARIABLE,paired=TRUE)
```

Syntax Elements

- Function : t.test (with paired=TRUE)
  - Tells *R* to calculate an paired samples (dependent) *t* test to compare the means of two variables

```
> t.test(mydata$Var1,mydata$Var2, paired=TRUE)

        Paired t-test

data:  mydata$Var1 and mydata$Var2
t = -7.5309, df = 49, p-value = 1.003e-09
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 -0.6155390 -0.3562285
sample estimates:
mean of the differences
             -0.4858838
```

If $p > \alpha$, the *t* test is not significant and the null hypothesis should be retained.

nonparametric analysis for within-subjects designs

WILCOXON SIGNED RANKS TEST

COMPARE RANKS

Conduct a test to compare the ranks of the observations on two variables within the data file.

Example Syntax

wilcox.test(dataTABLE$VARIABLE,dataTABLE$VARIABLE,paired=TRUE)

Syntax Elements

- Function : wilcox.test (with paired=TRUE)
  - Tells *R* to calculate a Wilcoxon Signed Ranks test to compare the ranks of the observations of the variable across two variables

If $p > \alpha$, the test is not significant and the null hypothesis should be retained.

```
> wilcox.test(mydata$Var1,mydata$Var2, paired=TRUE)

        Wilcoxon signed rank test with continuity correction

data:  mydata$Var1 and mydata$Var2
V = 96, p-value = 1.766e-07
alternative hypothesis: true location shift is not equal to 0
```