T-Test

The Independent Sample T-Test compares the mean scores of two groups on a given variable. In this example, we compare "frequency of sex" for males versus females.

Null Hypothesis: The means of the two groups (males and females) are <u>not</u> significantly different.
Alternate Hypothesis: The means of the two groups (males and females) are significantly different.

```
. oneway sexfreq sex

                    Analysis of Variance
    Source               SS         df      MS            F       Prob > F
-----------------------------------------------------------------------
Between groups       134.322319       1   134.322319     33.64     0.0000
 Within groups       8579.95197    2149   3.99253233
-----------------------------------------------------------------------
    Total            8714.27429    2150   4.05315083

Bartlett's test for equal variances:  chi2(1) =    6.3875  Prob>chi2 = 0.011
```

Bartlett's test tests the hypothesis that our samples have equal variances. If the Chi-Square test is significant (p < .05), then we can reject the null hypothesis and assume that variances are unequal. In this case, Chi-Square is significant and we can reject the null hypothesis and assume that variances are unequal.

```
. ttest sexfreq , by(sex)

Two-sample t test with equal variances

------------------------------------------------------------------------------
   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
    male |     976    3.099385    .0612103    1.912271    2.979266    3.219504
  female |    1175    2.597447    .0602927     2.06673    2.479153     2.71574
---------+--------------------------------------------------------------------
combined |    2151    2.825198    .0434086    2.013244     2.74007    2.910325
---------+--------------------------------------------------------------------
    diff |               .5019384    .0865368                .3322339    .6716429
------------------------------------------------------------------------------
Degrees of freedom: 2149

                  Ho: mean(male) - mean(female) = diff = 0

   Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
     t =   5.8003                 t =   5.8003                  t =   5.8003
   P < t =  1.0000             P > |t| =   0.0000             P > t =   0.0000
```

We can see here that males report higher frequencies of sex than females. However, we cannot tell from here whether or not this difference is significant.

Our "t" value is 5.842. There is a significant difference between the two groups. We can conclude, then, that males and females significantly differ in their reports of sexual frequency: males reported higher levels of sexual frequency than did females. The circled value indicates the difference in means (male score minus female score).