Chapter 25: Paired Samples and Blocks

We cannot use a two-sample t-test for paired data because paired data come from samples that are not ____________________________. If we know the data are paired, we can examine the ____________________________. Because it is the ____________________________ we care about, we treat them as if they were the data and ignore the original two sets of data.

Now that we have only ___________ set of data to consider, we can return to the simple one-sample t-test.

Mechanically, a paired t-test is just a one-sample t-test for the mean of the pairwise differences. The sample size is the number of __________.

**P** (define parameter)

\[ \mu_d : \]

**H** (write hypotheses)

\[ H_0 : \mu_d = \Delta_0 \] (this value is usually ___________)

\[ H_A : \mu_d < \Delta_0 \]

\[ : \mu_d > \Delta_0 \]

\[ : \mu_d \neq \Delta_0 \]

**A** (check assumptions)

1. Random sample (using _________________ data)
2. Sample is large enough
   - Small: (n<15)
   - Medium: (15<n<40)
   - Large: (n>40)
3. ...but not too large

**N** (name procedure)

If all of the necessary assumptions and conditions have been met, we may proceed with the _____________________________

**T** (calculate test statistic)

\[ t_{n-1} = \]

**O** (obtain p-value)

**M** (make decision)

_____ \( H_0 \) since the p-value is _____ \( \alpha \)

**S** (state conclusion)

If \( H_0 \) were true, we would expect to see a sample result at least as extreme as the one we observed in about _____ out of every _____ samples of this size by chance. This ____________ strong enough evidence to conclude \( H_A \).
We may also construct a confidence interval to estimate the true mean difference.

**P** (define parameter) \( \mu_y \):

**A** (check assumptions)
1. Random sample (using ______________ data)
2. Sample is large enough
   - Small: \( n<15 \)
   - Medium: \( 15<n<40 \)
   - Large: \( n>40 \)
3. ...but not too large

**N** (name procedure) If all of the necessary assumptions and conditions have been met, we may proceed with the ______________

**I** (find interval) \( \text{estimate} \pm \text{critical value} \times SE(\text{estimate}) \)

**C** (state conclusion) We are ____% confident that the true mean difference between ____ and ____ is between about ____ and ____ , because ____% of all samples of this size will produce an observed difference within about ____ of the true mean difference.