One of the most commonly used statistical techniques is the comparison of two means, also known as the t-test (for this you need quantitative, or interval level data).  If you used the same data to compare means with equal sample sizes, how would the results compare if you used the paired sample, independent sample equal variance, and independent sample unequal variance?  Which is the most "conservative" and why might you use it by default?

**The Manager of the Toledo Mudhens decides to see whether batting practice (think of this as the equivalent a week long series of professional development seminars) has any impact. Twenty Mudhens take batting practice; they are a randomly selected experimental group.   Ten Mudhens, randomly selected, take no batting practice (control group).   After 30 games, the figures shown in the accompanying table are available. What can you tell the manager about his experiment, statistically and managerially (i.e. practically)?**

|  |  |  |
| --- | --- | --- |
|  | Batting Practice Group | No-Practice Group |
| Mean | .212 | .193 |
| Standard Deviation | .026 | .047 |
| Sample Size (n) | 20 | 10 |

**State your null and alternative hypotheses:**

##### 1a. Using data from the question above, calculate your t-score – which involves first calculating the standard of error for the difference (see formulas in your text; is this a paired or independent sample?; assume unequal variance.)

##### 1.b. Estimate the p-value for your t-score (using the simplified formula for degrees of freedom *k* equal to n1+n2-2, where n are the sample sizes.)    You may do this using the Excel function=tdist(t, d.f., 1 tail)

##### 1c. Is the difference of means statistically different from zero? Is it practically different from zero? In other words, what can you tell the manager about this experiment? Should s/he institute the new batting practice procedure?

**2.  A supervisor in the Department of Rehabilitive Services is critical of the performance of one of her counselors.   The counselor is expected to arrange job training for those in need of vocational rehabilitation so that they may find employment.   Yet the counselor has managed to place just 35% of his clients. The counselor argues that he is doing a good job and that the reason for his overall low rate of placement is that most of his clients are severely disabled, which makes them very difficult to place.     
  
The counselor’s case load is presented in the accompanying table.   Percentage the table appropriately, and evaluate who is correct -- the supervisor or the counselor?**

|  |  |  |
| --- | --- | --- |
| *Job Placement* | *Not Severely Disabled* | *Severely Disabled* |
| Not Placed | 17 | 118 |
| Placed | 47 | 26 |

|  |
| --- |
|  |