

In the late 1800s, a strong winter storm in Rhode Island knocked a population of house sparrows unconscious. The birds were brought to Hermon Bumpus at Brown University. He took measurements on the birds, and found that some of the birds were still alive and revived, while others died. You are going to use his data to try out some data manipulation, graph creation, and statistical analysis in Excel.

1. **Review the video** – it will walk you through sorting your data, calculating means and standard deviations, how to make bar graphs and scatter plots, and how to perform correlations and calculate t-test p-values. *Note: additional documents are available online which review material covered in the video.*
2. **Examine the Bumpus data.** We are using a subset of the data that includes information about whether the birds survived (T= true / survival, F = False / death), the skull length and the total length of the birds.
3. **Calculate:**
 - a. Mean skull length and total length of birds that
 - i. Survived
 - ii. Died
 - b. Standard deviations of skull length and total length of birds that
 - i. Survived
 - ii. Died
 - c. The appropriate statistic, p-value and degrees of freedom for:
 - i. A test for a difference in skull length between birds that survived and those that died
 - ii. A test for a difference in total length between birds that survived and those that died
 - iii. A test for a correlation between total length and skull length in all birds
4. **Make the following figures:**
 - a. A comparison of skull length in birds that survived and died. Make sure to include error bars based on the standard deviations.
 - b. A comparison of total length in birds that survived and died. Make sure to include error bars based on the standard deviations.
 - c. A figure that shows the relationship between skull length and total length in all of the birds.
5. **Make sure all of your axes are labeled in your figures.**
6. **Each figure should be accompanied by a sentence that describes the result and includes the appropriate statistical information in a parentheses.**
 - a. Example: Dogs were on average significantly larger than cats ($t=2.44$, $df=20$, $p=0.04$).
7. **Homework: is to turn in the 3 figures and their accompanying sentences (typed!!).**