High sparrow body length decreases survival

A demonstration of Rmarkdown using Herman Bumpus' data

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Abstract

Writing documents in Rmarkdown using Rstudio can make scientific workflow more efficient, and here I demonstrate how a scientific manuscript can be written using a classical data set first published by Herman Bumpus. I integrate Bumpus' data with Rmarkdown to produce a sample manuscript, testing whether or not sparrow body length decreases survival following a storm in southern New England. Using a t-test, I show that surviving birds have lower body length than birds that do not survive. All analyses of data are incorporated into the underlying Rmarkdown document, including figures and a table. References are incorporated using BibTeX. The underlying code for this manuscript is publicly available on GitHub as part of the Stirling Coding Club organisation.

Introduction

In the late 1800s, there was a particulalry severe snowstorm in Providence, Rhode Island. At the time, Herman Bumpus was a professor of comparative zoology at Brown University. Bumpus noticed that the storm had a particularly negative effect on the local sparrow population (*Passer domesticus*) and decided to use the event to test Charle's Darwin's theory of natural selection (Darwin 1959). Bumpus collected 136 sparrows; some of these sparrows survived the storm, while others perished. Bumpus published a paper and all of the data that he had collected (Bumpus 1989). These data are now a classic data set in biology, and have been analysed multiple times (e.g., Johnston et al. 1972). Here I will use Bumpus' data to demonstrate how to write a scientific manuscript in Rmarkdown.

The focus of this manuscript is therefore not on Bumpus' data or survival of sparrows *per se*, but the process of scientific writing using Rmarkdown. I have chosen the Bumpus data set because it provides a useful tool for working through most key features of Rmarkdown that scientists might want to use when writing a manuscript. The example question that I will address through this data set and R analysis in Rmarkdown is whether or not increasing sparrow body length is associated with decreased survival following a storm.

References

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