

Comparing VBGF Exercise

Derek H. Ogle, Northland College

20-Aug-2016

Mooij et al. (1999) examined length-at-age data of European Perch (*Perca fluviatilis*) from Lake Tjeukemeer (The Netherlands) to identify possible sexual dimorphism in growth trajectories. Their data consisted of fork length (FL; cm), ages (yrs) from otoliths, and sex from 69 fish and may be obtained with `data(EuroPerchTJ)` from the `FSAdata` package). Use these data to answer the following questions.

1. Plot FL versus age with different symbols for each sex.
 - a. Do you foresee any model fitting problems with these data?
 - b. Do you observe any possible differences in growth between the sexes?
2. Fit the *additive* errors (i.e., no logarithms) typical VBGF where all parameters differ by sex.
 - a. Assess the assumptions from this model fit.
 - b. Compute point and bootstrapped 95% confidence interval estimates for each parameter in this model. Describe any problems that you encountered.
3. Find the most parsimonious model that is a subset of the model fit above.
 - a. Using either a likelihood ratio or extra sums-of-squares test.
 - b. Summarize (in words) the results of the most parsimonious model identified above.
4. **[Time Permitting]** Fit the typical VBGF separately to both sexes.
 - a. Compute point and bootstrapped 95% confidence interval estimates for each parameter in the separate models.
 - b. Describe any problems that you encountered.
 - c. How do the point estimates from these separate models compare to the point estimates from the most complex model in #2 above?
 - d. Do you see any issues with the confidence intervals? If so, describe.
5. **[Time Permitting]** Construct a summary graphic that shows the growth trajectories superimposed on the observed data for both sexes.