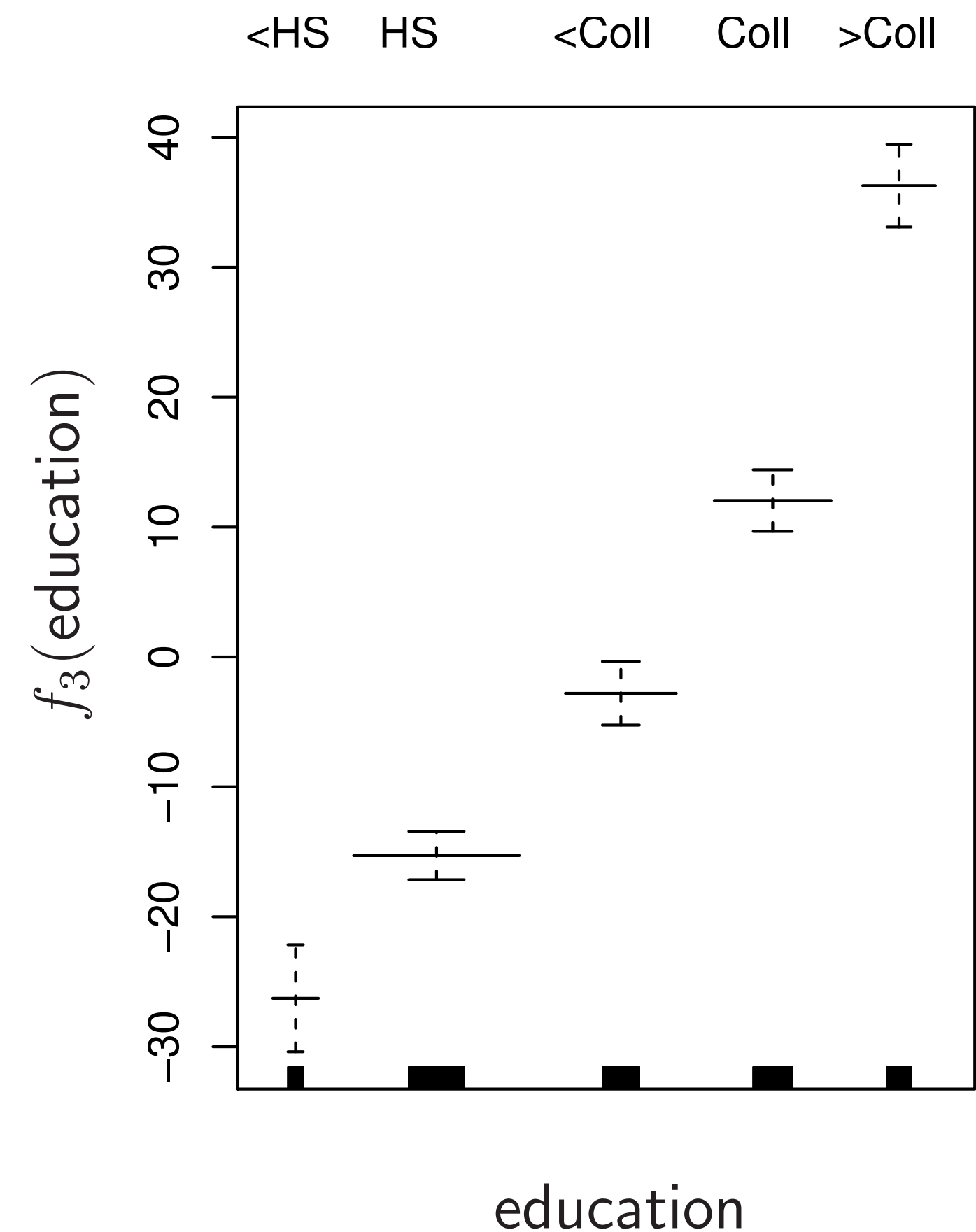
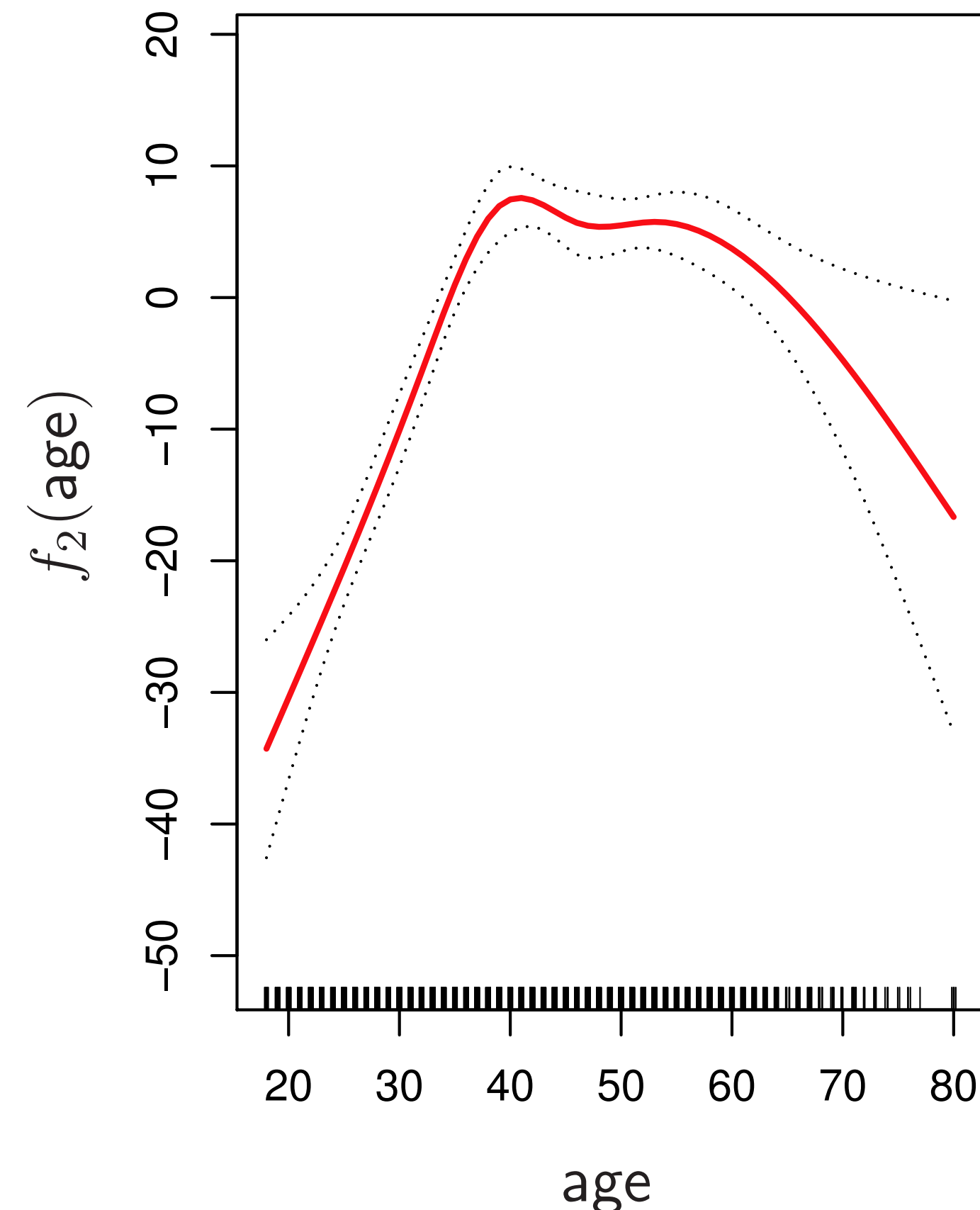
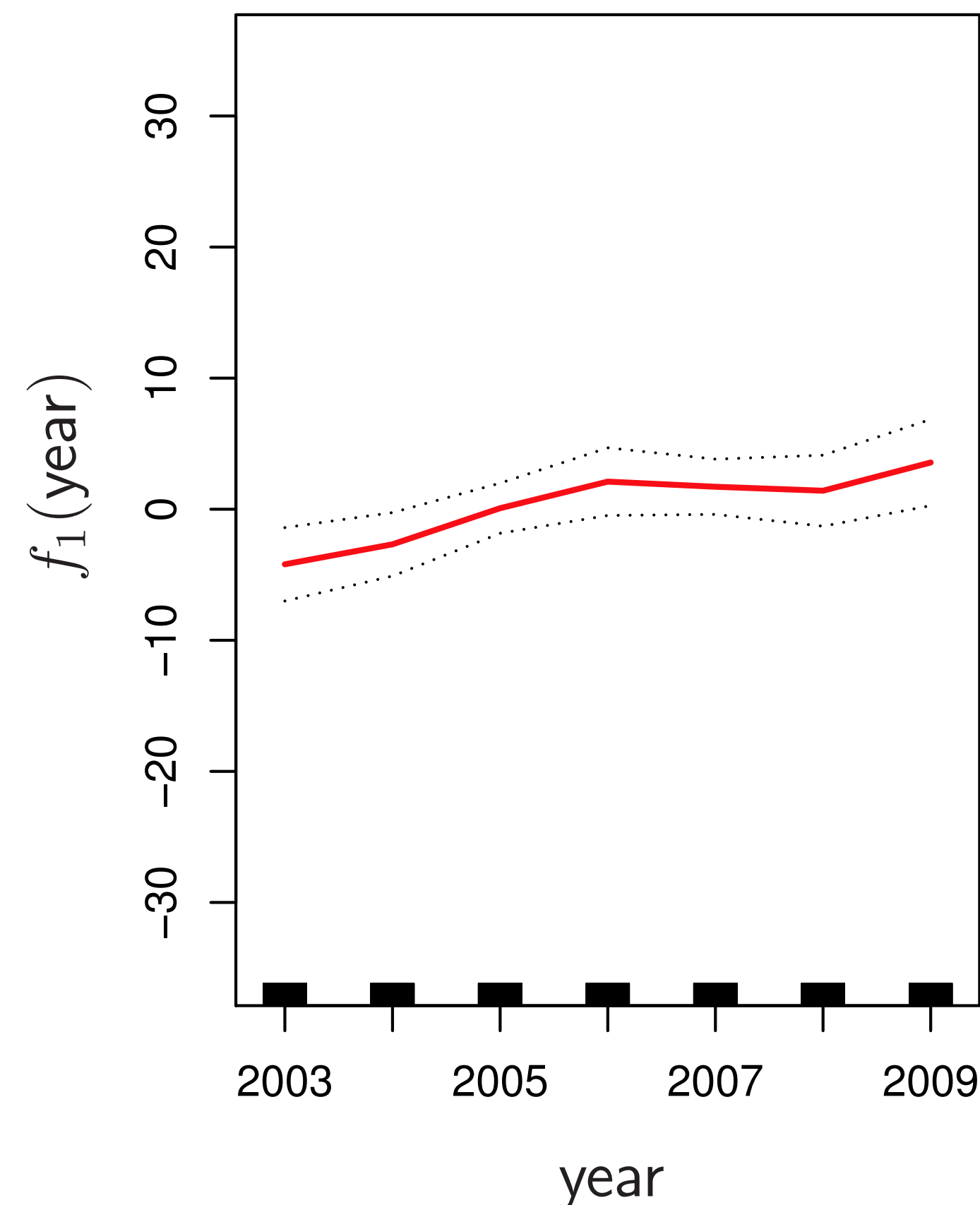


# Generalized Additive Models (GAMs)

## Example: Wage (ISLR2)

the first two functions are natural splines in year and age

the third function is a step function, fit to the qualitative variable education



# Generalized Additive Models (GAMs)

- + Very flexible in choosing non-linear models and generalizable to different types of responses.
  - + Because of the additivity we can still interpret the contribution of each predictor while considering the other predictors fixed.
  - + GAMs can outperform linear models in terms of prediction.
  - + Built on the framework of GLMs, so can handle different response distributions
- 
- Additivity is convenient but it is also one of the main limitations of GAMs (independent contributions of predictors)
  - Spline fitting and penalization can be computationally intensive for large data.
  - GAMs might miss non-linear interactions among predictors.