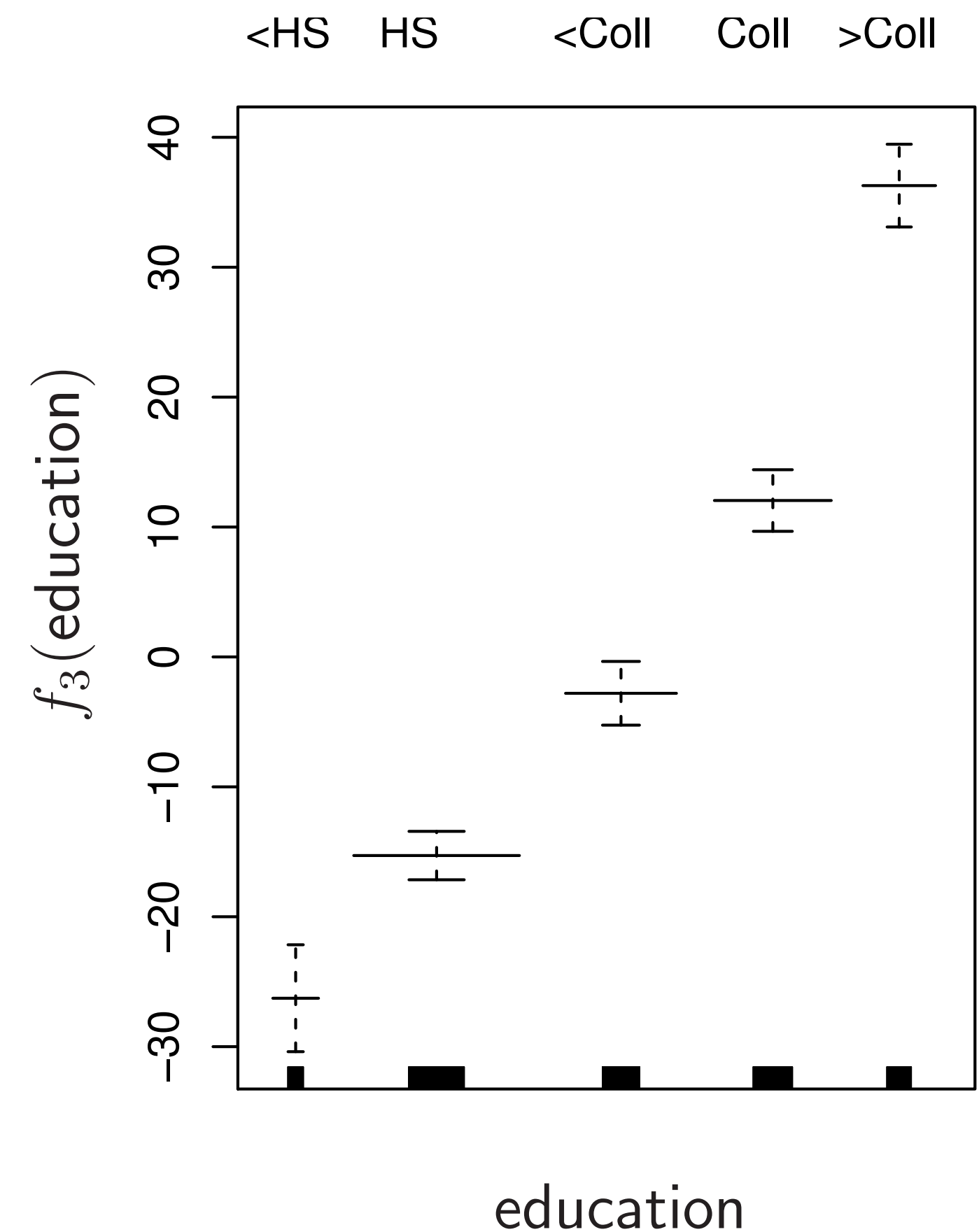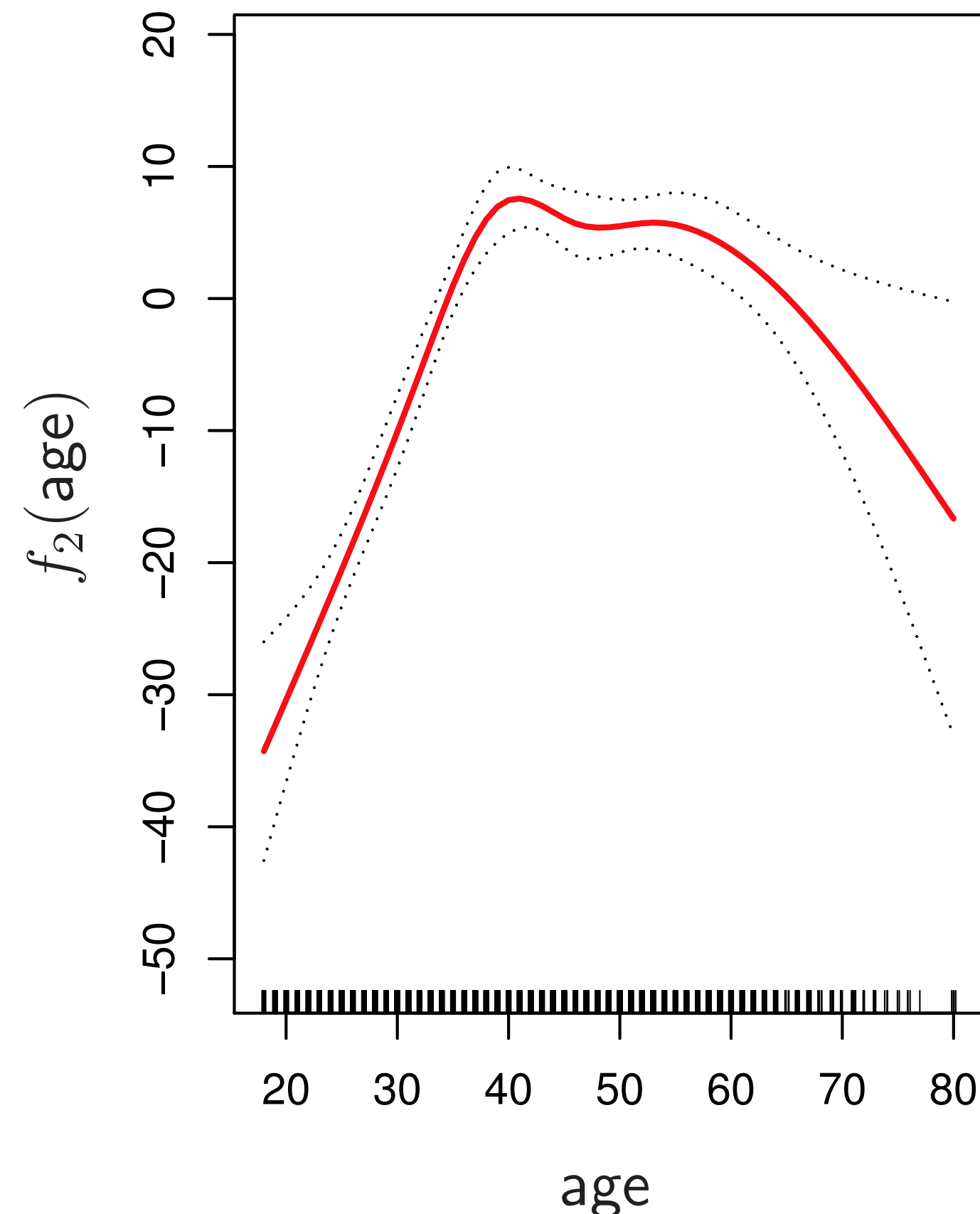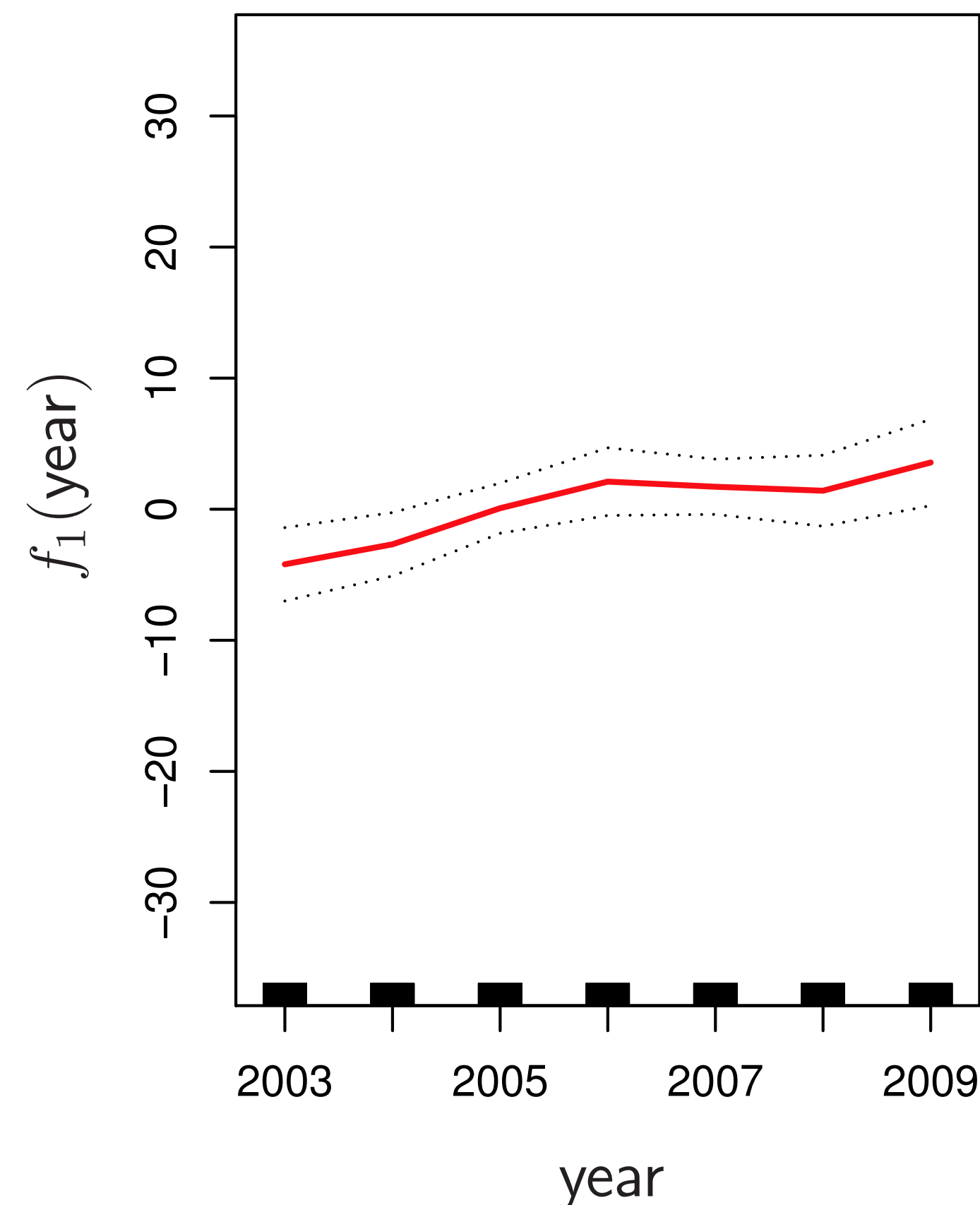# Generalized Additive Models (GAMs)

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.