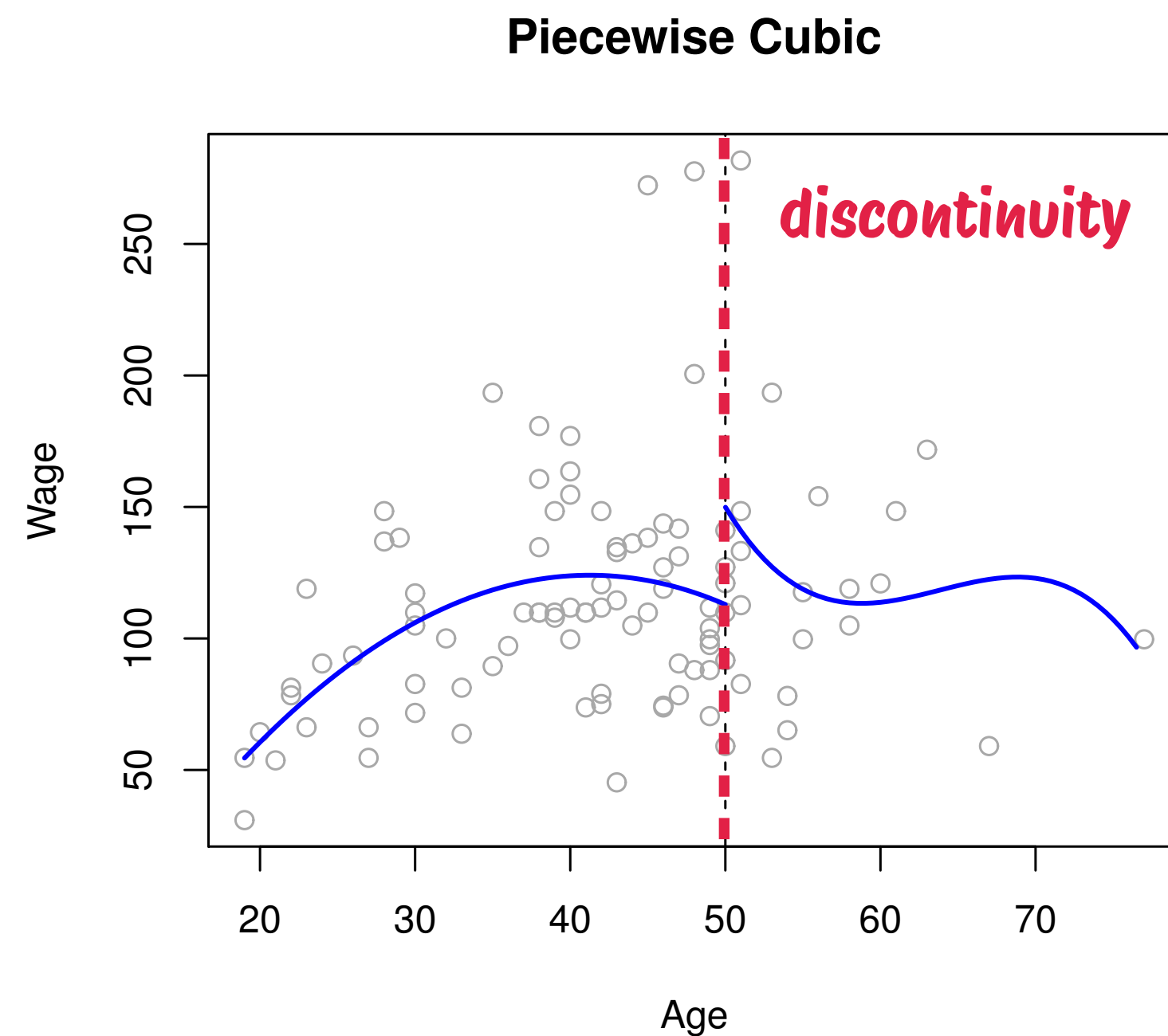# Regression Splines

Example: Wage (ISLR2)

Piecewise cubic polynomial with a single knot placed a age = 50:

$$\text{wage} = \begin{cases} f_1(\text{age}) = \beta_{01} + \beta_{11}X + \beta_{21}X^2 + \beta_{31}X^3 & \text{if age} < 50 \\ f_2(\text{age}) = \ \beta_{02} + \beta_{12}X + \beta_{22}X^2 + \beta_{32}X^3 & \text{if age} \geq 50 \end{cases}$$
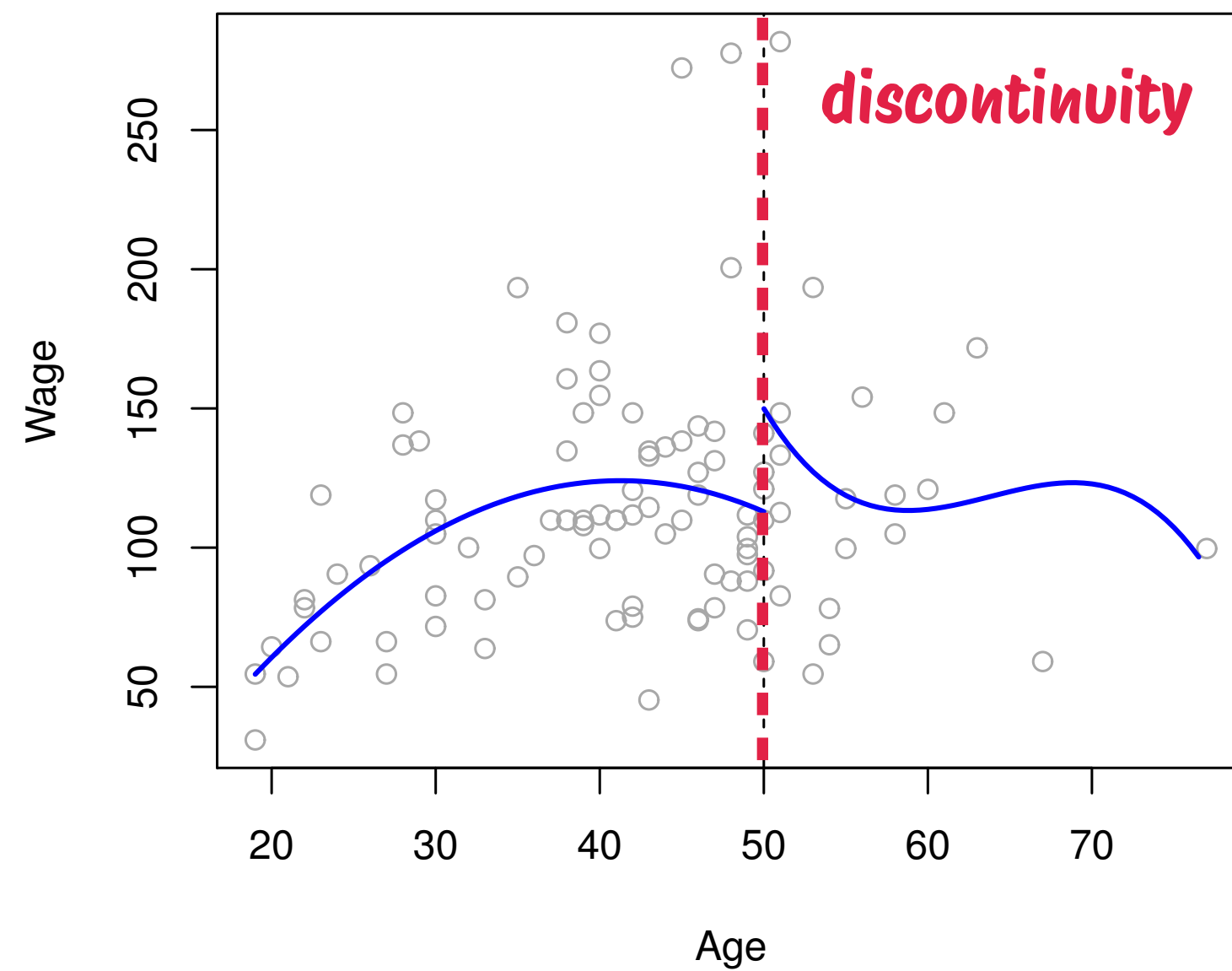
Piecewise Cubic

Continuous Piecewise Cubic

discontinuity

Linear Spline

Regression Splines

Example: Wage (ISLR2)

Piecewise cubic polynomial with a single knot placed a age = 50. Constraints:

1. $f_1(\text{age} = 50) = f_2(\text{age} = 50)$