

1.1 Population Regression Function

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PRF

$$\text{Expected Value} = E(x) = \sum_i f_i x_i = \int_{-\infty}^{\infty} u f(u) du$$

Random Variable?

↑
Probability density function



$$\begin{aligned} y_i &= E(y|x) + \text{Residual} \\ E(y|x) &= \text{Linear Function} \\ E(y) &= \beta_0 + \beta_1 x \\ &= \beta_0 + \beta_1 x + \beta_2 x^2 \\ &= \beta_0 + \beta_1 x + \beta_2 \frac{1}{x} \\ E(\ln y) &= \beta_0 + \beta_1 \ln(x) \end{aligned}$$

Specification Error: shape of approx \neq shape of PRF