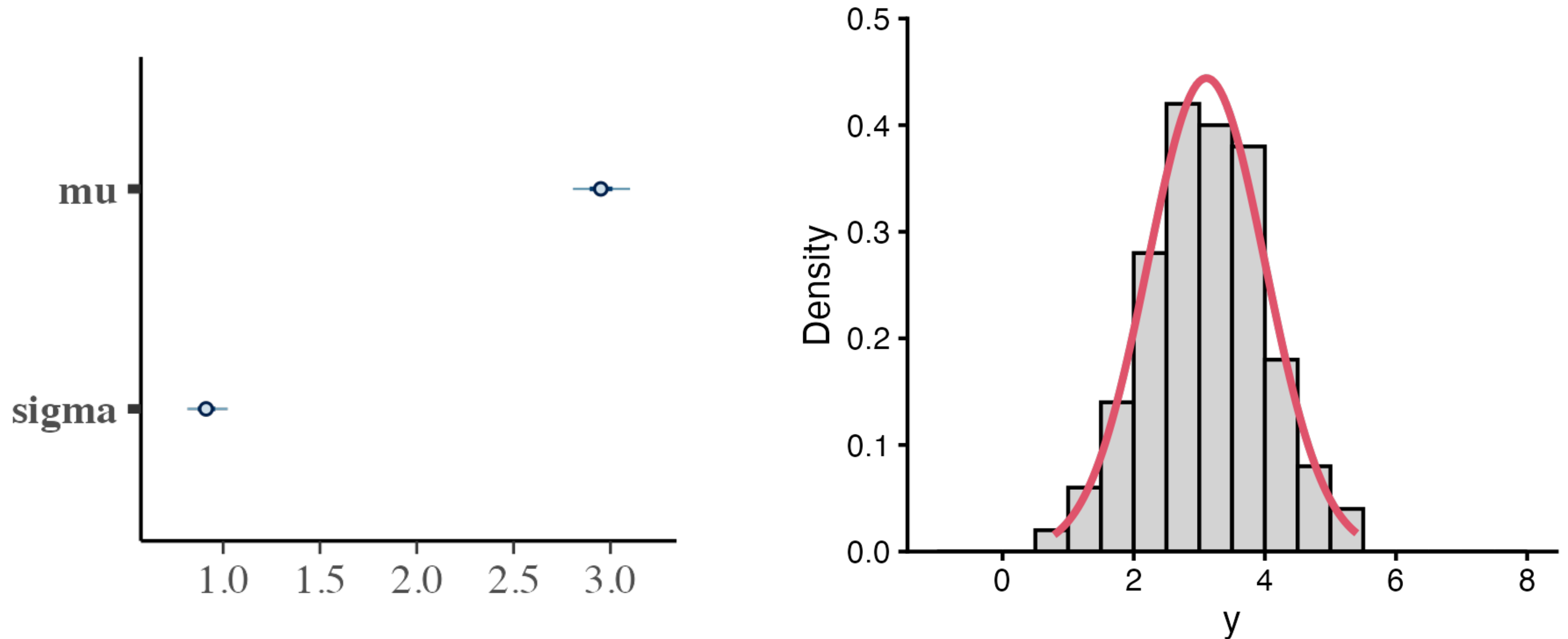# Model fit and parameter estimates

The linear model

Adding more variables

- The main strategy for making useful probabilist models is to **allow the parameters to vary**

- If we have two measured variables:

  - y_i: the dependent variable, the outcome, the response, the predicted

  - x_i: the independent variable, the treatment, the control, the predictor

- We make the parameter μ a linear function of the predictor variable:

$$
\begin{aligned}
y_i &\sim N(\mu_i, \sigma) \\
\mu_i &= \alpha + \beta x_i
\end{aligned}
$$

- This replaces μ with two new parameters:

  - α: the **intercept**

  - β: the **slope of x**