

X_1, X_2, \dots, X_n unabhängige

$$E[X_i] = \mu$$

$$V[X_i] = \sigma^2$$

$$\bar{X} = \frac{1}{n} \sum_{i=1}^n X_i$$

$$E[\bar{X}] = \frac{1}{n} \sum_{i=1}^n \underbrace{E[X_i]}_{\mu} = \frac{1}{n} \cdot n \cdot \mu = \mu$$

$$V[\bar{X}] = \left(\frac{1}{n}\right)^2 \sum_{i=1}^n \underbrace{V[X_i]}_{\sigma^2} = \frac{1}{n^2} \cdot n \cdot \sigma^2 =$$
$$\frac{\sigma^2}{n}$$

$$\frac{\sigma}{\sqrt{n}} = \frac{\sigma}{\sqrt{n}}$$