

Meaning

- When we reject H_0 we say that the result is **statistically significant**
- A result might be statistically significant but the effect size might be small
- In such a case, we have a statistical significance but no **scientific or practical significance**:
 - statistical significance \neq scientific significance
- in such cases [[Konfidenzintervall]] are more informative than [[Hypothesentests]]

Example

Suppose we extend an app by adding two features and perform two separate user satisfaction studies ($n = 100$ in both studies). For the first feature we obtain an average user satisfaction of 6.6, and for the second of 7.1, $\sqrt{S_n/n} = 0.05$ in both studies. The old version of the app had the average user satisfaction of 6.5. For both studies we define H_0 : no improvement in the new versions. Can we reject H_0 for both features at the significance level $\alpha = 0.05$? Compare these results with 95% confidence intervals for the sample means for both features.

For both features:

$$H_0 : \mu = 6.5$$

$$H_1 : \mu > 6.5$$

We perform one sided Z-Test by computing the critical value:

$$c = \mu + z_{1-\alpha} \frac{\sigma}{\sqrt{n}} = 6.5 + 1.645 \cdot 0.05 = 6.58225$$

Thus, for both features we reject H_0 . The 95% Z-score confidence intervals are:

Feature 1: $6.6 \pm 0.098 = (6.502, 6.698)$

Feature 2: $7.1 \pm 0.098 = (7.002, 7.198)$

- statistical but no practical improvement for feature 1
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