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**:
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$$\text{statistical significance} \not\Rightarrow \text{scientific significance}$$
- 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:
$$\begin{aligned} H_0 &: \mu = 6.5 \\ H_1 &: \mu > 6.5 \end{aligned}$$
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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