statistical vs. practical significance

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practice

All else held equal, will the p-value be lower if n = 100 or n = 10,000?

(a) n = 100

(b) n = 10,000

$$\bar{x} = 50$$

$$s = 2$$

$$H_0 : \mu = 49.5$$

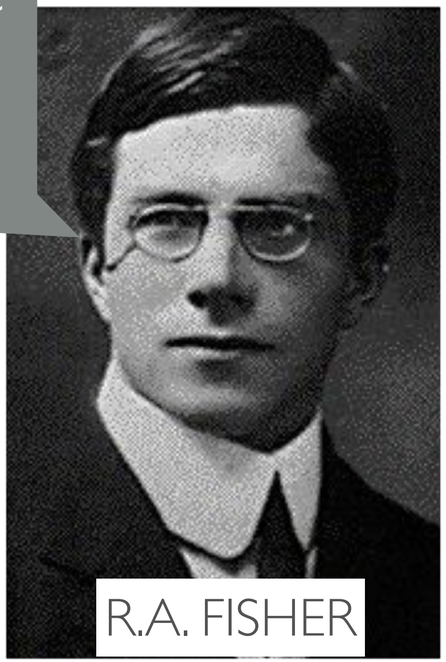
$$H_A : \mu > 49.5$$

$$Z_{n=100} = \frac{50 - 49.5}{\frac{2}{\sqrt{100}}} = \frac{50 - 49.5}{\frac{2}{10}} = \frac{0.5}{0.2} = 2.5$$

$$Z_{n=10000} = \frac{50 - 49.5}{\frac{2}{\sqrt{10000}}} = \frac{50 - 49.5}{\frac{2}{100}} = \frac{0.5}{0.02} = 25$$

- Real differences between the point estimate and null value are easier to detect with larger samples.
- However, very large samples will result in statistical significance even for tiny differences between the sample mean and the null value (effect size), even when the difference is not practically significant.

"To call in the statistician after the experiment is done may be no more than asking him to perform a post-mortem examination: he may be able to say what the experiment died of."



Fisher: http://upload.wikimedia.org/wikipedia/en/2/21/RonaldFisher1912.jpg