

Independent Groups t-test

QUESTION: Does a new type of chemotherapy prolong the lives of women with terminal cancer?

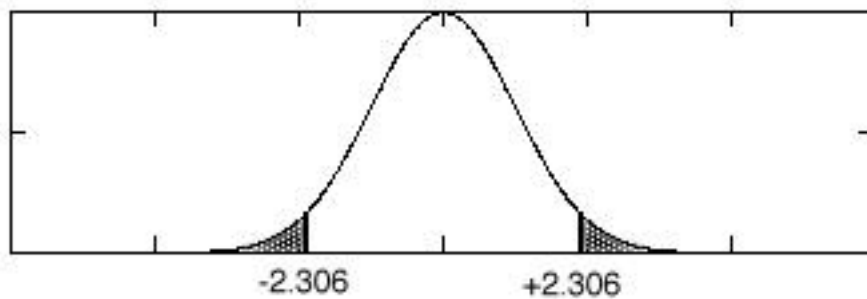
EXPERIMENT: Randomly sample 10 women with terminal cancer. Randomly assign 5 women to get the new drug (Experimental Group) and 5 women to get a placebo (Control Group).

STATISTICAL HYPOTHESES: $H_0: \mu_{Exp} = \mu_{Cont}$, or $\mu_{Exp} - \mu_{Cont} = 0$

$H_1: \mu_{Exp} \neq \mu_{Cont}$, or $\mu_{Exp} - \mu_{Cont} \neq 0$

DECISION RULE: Reject H_0 if t_{Obt} occurs with $p < .05$.

With a sample $n=5$ in each group, $df = 8$, $t_{Crit} = 2.306$.



PICTURE:

DATA:

Control	Experimental
6	9
5	8
3	9
5	7
4	8

FORMULAS:

$$t_{Obt} = \frac{(\bar{X}_{Exp} - \bar{X}_{Cont}) - (\mu_{Exp} - \mu_{Cont})}{S_{\bar{X} - \bar{X}}}$$

$$S_{\bar{X} - \bar{X}} = \sqrt{\frac{S_p^2}{n_{Exp}} + \frac{S_p^2}{n_{Cont}}}$$

$$S_p^2 = \frac{SS_{Exp} + SS_{Cont}}{df_{Exp} + df_{Cont}}$$

DECISION:

INTERPRETATION: