

AMS 7

11/12/09

R-84

DISCUSSION SECTION #7

- paired-comparison  $\rightarrow$  repeated measures design
- $\bar{d} = 0.20$  practically significant if growth measured over a long period of time (not pract. sig immediately)
- (3) gives idea about the size of the girl
- STAT SIG?  $\Rightarrow$  INFERENTIAL SUMMARY, 95% CI
  - similar to deer hind-fore leg ex. (chs, 11/3)

POP  
all US girls  
age 5 1/2 to in '50's

SAMPLE  
observed girls

IMAGINARY  
possible  $\bar{d}$ 's

$\left[ \begin{array}{c} \mu_d \\ SD \end{array} \right]$

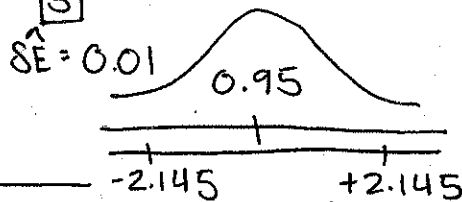
difference in jaw size

$\left[ \begin{array}{c} \mu_d \\ SD \end{array} \right] n=15$

mean  $\bar{d} = 0.20$  cm  
SD  $s_d = 0.039$  cm

$\left[ \begin{array}{c} 0.20 \\ 0.22 \\ \vdots \end{array} \right] M = \infty$

- EV of  $\bar{d} = \mu_d$
- $\hat{SE}$  of  $\bar{d} = 0.01$  cm
- $\hat{SE} = 0.01$

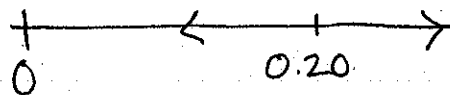


INFERENTIAL SUMMARY

UNKNOWN pop quantity of interest	$\mu_d =$ pop mean growth in jaw
estimate	$\bar{d} = 0.20$ cm
give or take	$\hat{SE}(\bar{d}) = 0.01$ cm
95% CI	$\bar{d} = \pm 2.145 \hat{SE}$

1  
2  $\hat{SE}_{HD}(\bar{d}) = \frac{s_d}{\sqrt{n}} = \frac{0.039}{\sqrt{15}} = 0.01$  cm

0 not in 95% CI  $\Rightarrow$  HIGHLY STATISTICALLY SIG



R-89 DISCUSSION SECTION 8

- 1) 2 SAMPLES  $\rightarrow$  INDEPENDENT  $\rightarrow$  CONTINUOUS
- values could be scrambled
  - different sample sizes

Similar to: Daphnia Case Study (11/5)

L-195

- $\rightarrow$  2 INDEPENDENT SAMPLES W/2 MODEL DIAGRAMS
- DOES THE MEAN DIFFERENCE IN CLOTTING TIME SEEM PRACTICALLY SIGNIFICANT?
    - Yes, drug G  $\approx$  10% less effective than drug B

STATISTICAL INFERENCE  $\rightarrow$  INFERENCEAL SUMMARY

(see 11/10)  
Formula  
Sheet (R-25)  
(11)  
Formula (12)

UNKNOWN pop quantity of interest	$(\mu_2 - \mu_1) =$ pop mean difference in clotting time
estimate	$\bar{y}_2 - \bar{y}_1 = +0.99$ min
give or take	$\hat{SE}(\bar{y}_2 - \bar{y}_1) = 0.39$ min
95% CI	$0.99 \text{ min} \pm (2.2)(0.39 \text{ min})$

B

POP  
all ppl w/ hemophilia

$\mu_1 = ?$   
 $\sigma_1 = ?$

SAMPLE (n=6)  
clotting time (min)

$\bar{y}_1 = 8.75$   
 $SD_{s_1} = 0.58$

IMAGINARY  
POSSIBLE

G

POP

$\mu_2 = ?$   
 $\sigma_2 = ?$

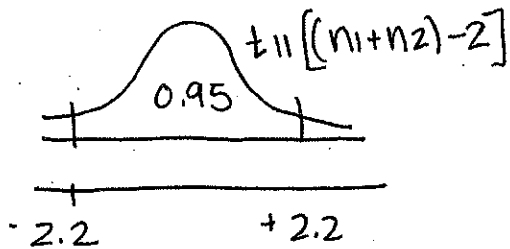
SAMPLE (n=7)

$\bar{y}_2 = 9.74$   
 $SD_{s_2} = 0.82$

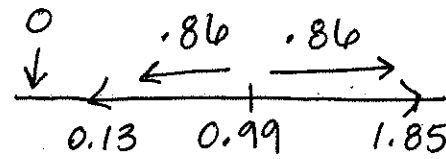
IMAGINARY

$$\hat{SE}(\bar{y}_2 - \bar{y}_1) = \sqrt{\frac{(0.58)^2}{6} + \frac{(0.82)^2}{7}} = 0.39$$

Long Run Histogram ( $\bar{y}_2 - \bar{y}_1$ )



$$t_{11} \quad \hat{SE} \\ \downarrow \quad \downarrow \\ 2.2 (.39) = .86$$



0 is outside  $\Rightarrow$  DIFFERENCE  
IS STAT SIG

2.) OBSERVATIONAL STUDY

- questionable ethics prevents controlled experiment
- TREATMENT VARIABLE: Moderate vs. Low exercise
- OUTCOME: C Heart Disease / NO
- 2 INDEPENDENT SAMPLES w/ 1's & 0's

(L-201)

Similar to Sudden Oak Death Case Study (11/10)

$$101 / 10239 \text{ low} = 1\%$$

$$56 / 9877 \text{ mod.} = 0.5\%$$

PRACTICALLY & STATISTICALLY SIGNIFICANT  $\Rightarrow$  PCF'S NOT  
CONTROLLED