Class Notes

this time: Comparing 2 samples
next time: no class Mon, but on Wed: 2 samples, correlation
-reading: EPP ch 9, 9 (7)
-if your regular discussion section is on a Monday, you need
to go to another section this week
-new due date for homework 5: Wed, June 7
- Final exam review session: (looking for more now) probably
Monday evening, June 12

[Case study 14]

\[ \text{Pop} \]
\begin{align*}
\text{all possible} & \quad \text{Sample} & \quad \text{IDS} \\
\text{diff \& ratio} & \quad \text{diff \& ratio} & \quad \text{diff \& ratio}
\end{align*}

\[ N = \log \] \quad \text{like SRS} \quad \text{n=66} \quad \text{n=66} \quad \text{n=66}

\[ \text{mean (M)} \] \quad \text{mean (F)} \quad \text{mean (F)}

\[ \text{SD (S)} \] \quad \text{SD (S)} \quad \text{SD (S)}

\[ \text{L-R Mean} = E_{110} (\hat{b}) = 9.10 \quad \text{SE} \]

\[ \text{Est L-R SD} = \frac{E_{110} (\hat{b})}{n^{1/2}} = \frac{9.10}{\sqrt{66}} = 1.52 = 19.4 \]

\[ \text{CLT} \]

\[ \hat{b} = 19 \text{ cases} \]

Inferential Summary

quantity of interest: \( \Delta = \text{mean difference (diff - std)} \) in pop
estimate: \( \Delta = 69 \) cases
give or take: \( \text{SE}_{10} (\hat{b}) = \frac{\text{SE}}{\sqrt{n}} \) = 19 cases
95% CI for \( \Delta = \) \( \hat{b} \pm \text{SE} (\hat{b}) = -69 \pm 39 \) cases

Q: Is this difference large in practical terms?
A: \( \frac{\Delta - \hat{b}}{\text{SE} (\hat{b})} = \frac{-69 + 19}{9.4} = -7.5 \text{ (This IS LARGE)} \)
Q: Stat Sig?
A: Yes because 0 is not in the 95% CI.

There are two ways to get "matched pairs"
(1) - like CS14
(2) - person, before and after

Cae study 15]
raw data

<table>
<thead>
<tr>
<th>tribe 1</th>
<th>tribe 2</th>
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</thead>
<tbody>
<tr>
<td>( n_1 = 25 )</td>
<td>( n_2 = 27 )</td>
</tr>
<tr>
<td>mean ( (\bar{x}_1) = 59.4 \text{ in} )</td>
<td>mean ( (\bar{x}_2) = 61.3 \text{ in} )</td>
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<tr>
<td>SD ( (s_1) = 1.8 \text{ in} )</td>
<td>SD ( (s_2) = 2.4 \text{ in} )</td>
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2 independent samples - no linkage between them

Q: Is the difference (59.4 in vs. 61.3 in.) stat sig?
A: yes, 1.9 is a whole SD.

Q: Is it stat sig?
A: ...

(61.3 - 59.4 = 1.9 in. of 69.4)
Inferential Summary

Quant. of Interest: \( \mu_2 - \mu_1 \)

Estimate: \( \bar{x}_2 - \bar{x}_1 = 1.9 \text{ in} \)

Give or Take: \( s_e(\bar{x}_2 - \bar{x}_1) = 0.6 \text{ in} \)
\[ SE_{\text{indep independent}}(\bar{y}_2 - \bar{y}_1) = ? \]
\[ SE(\bar{y}_2) = 0.46 \text{ m} \]
\[ SE(\bar{y}_1) = 0.36 \text{ m} \]

\[ SE(\bar{y}_2 - \bar{y}_1) = SE(\bar{y}_2) + SE(\bar{y}_1) = \sqrt{(0.36)^2 + (0.46)^2} = 0.58 \]

\[ SE(\bar{y}_2 - \bar{y}_1) = SE(\bar{y}_2 - \bar{y}_1) - \sqrt{SE(\bar{y}_2)^2 + SE(\bar{y}_1)^2} \]
\[ = \sqrt{\left( \frac{s_1}{\sqrt{n_1}} \right)^2 + \left( \frac{s_2}{\sqrt{n_2}} \right)^2} \]

\[ SE_{\text{indep independent}}(\bar{y}_2 - \bar{y}_1) = \sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}} \]