Discussion section, week of 26-30 Nov 2018

Disc. sec. 6 (R-63) #1

Am57
26 Nov 18

R-(23) relative change: (1)

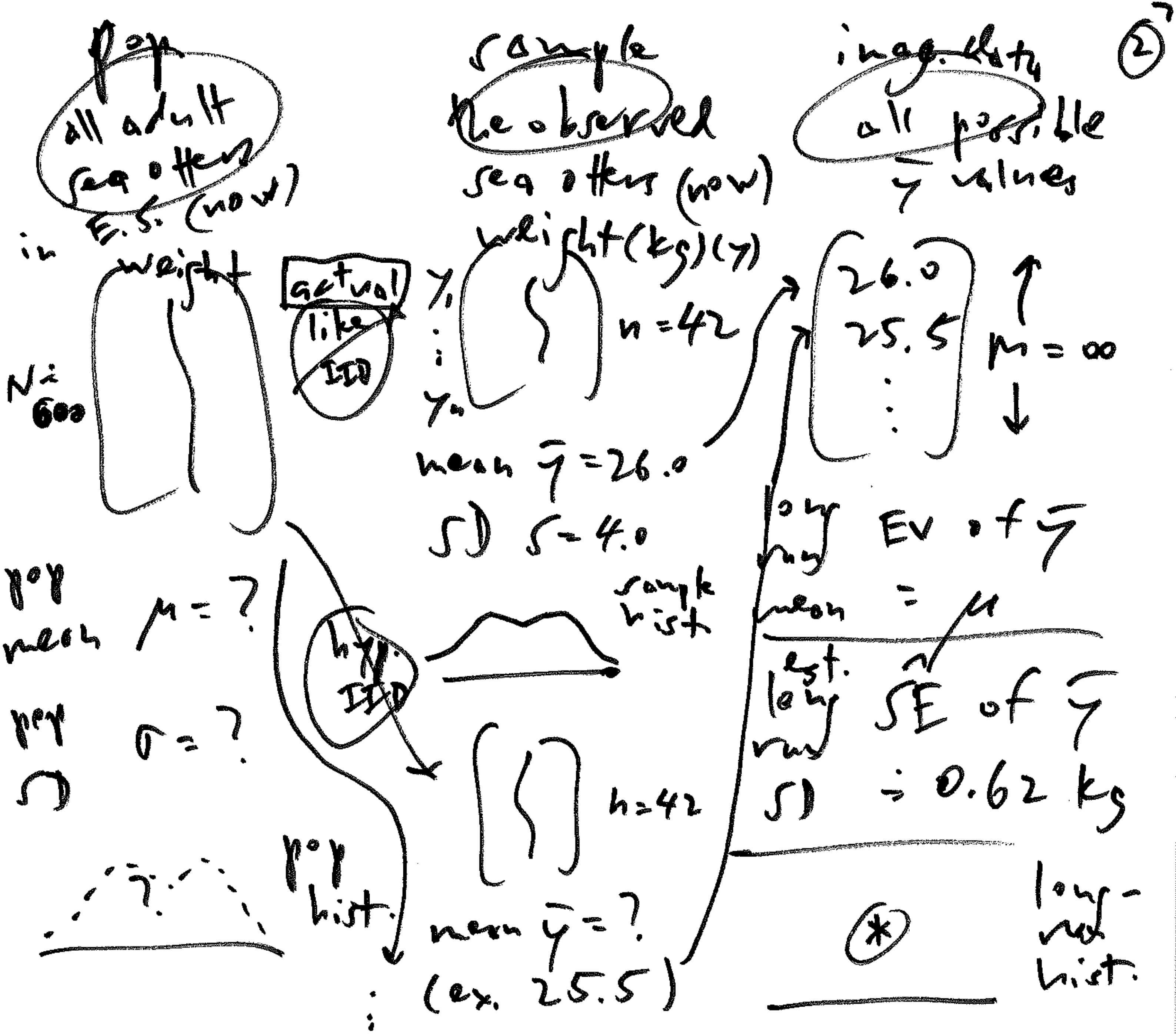
$$\frac{\text{new} - \text{old}}{\text{old}} = \frac{26.0\,\text{kg} - 28.1\,\text{kg}}{28.1\,\text{kg}} = -\frac{2.1}{28.1} = -0.075 = -7.5\%$$

on average the seq otter's weight has decreased by 7.5% in 5 years (1.5%/year), this diff. (i) is large in practical terms (1)(9)

inferential summary

unknown pop. parameter of main interest	μ = pop mean weight (kg)
estimate of μ	$\bar{y} = 26.0$ kg
give or take for $\bar{y}$ or est. of μ	$\hat{SE}(\bar{y}) = 0.6$ kg
95% CI for μ	$\bar{y} \pm t^{0.95}_{n-1} \cdot \hat{SE}(\bar{y}) = 26.0 \pm (2)(0.6)$ kg

Eg. of main interest



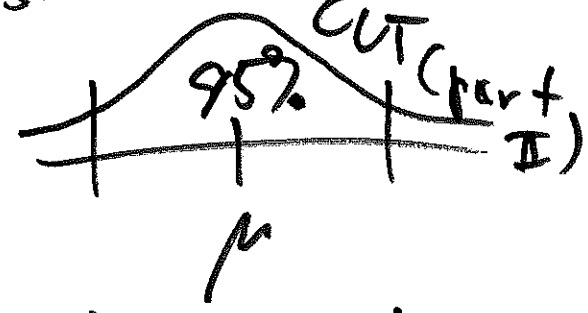
$$\text{EV of } \bar{y} = E_{IID}(\bar{y}) = \mu$$

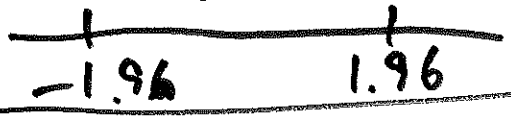
R-㉒ (3)

$$\hat{SE} \text{ of } \bar{y} = \hat{SE}_{IID}(\bar{y}) = \frac{s}{\sqrt{n}} = \frac{4.0 \text{ kg}}{\sqrt{42}}$$

$\doteq 0.62$ kg

$\hat{SE}$ @ 0.6 kg





long run hist. of $\bar{y}$

L - (142)

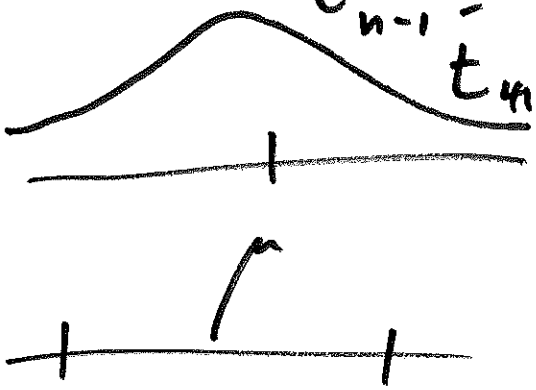
t-table

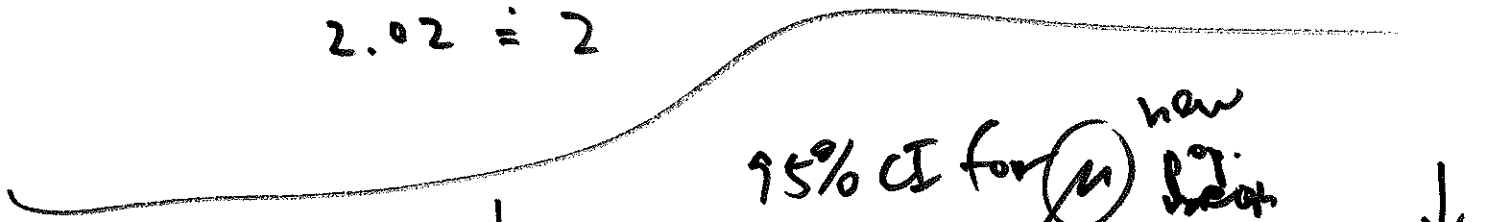
degrees of freedom	$t^{0.95}$
40	2.021
41	2.020
45	2.014

P - (23) (5)

long-run hist. of $\bar{y}$, accounting for uncertainty in σ

$\hat{SE}$ 0.6 kg





Since 28.1 kg (is not) in the 95% CI for μ, the diff. between $\bar{y} = 26.0$ & 28.1 (is) stat sig ↔ { is probably is (hard) to explain by unlucky sampling real

predicting the weight of a single or sample randomly chosen otter from pop: $l(\hat{\mu})$

best prediction is $\mu \doteq 26.0$ kg, $l(\mu)$

give or take $\sigma \doteq 4.0$ kg;

so $l(\mu)$ is false; to make

$l(\hat{\mu})$ true, replace 0.6 by 4.0

(empirical rule)

$$\frac{l(\hat{\mu}) \text{ true}}{l(\mu)} \checkmark$$