

Discussion Section 5

yp. R-61-62
#2
(continued)

AMS 7
14 Jul
2016

① hypothesis-testing approach to inference

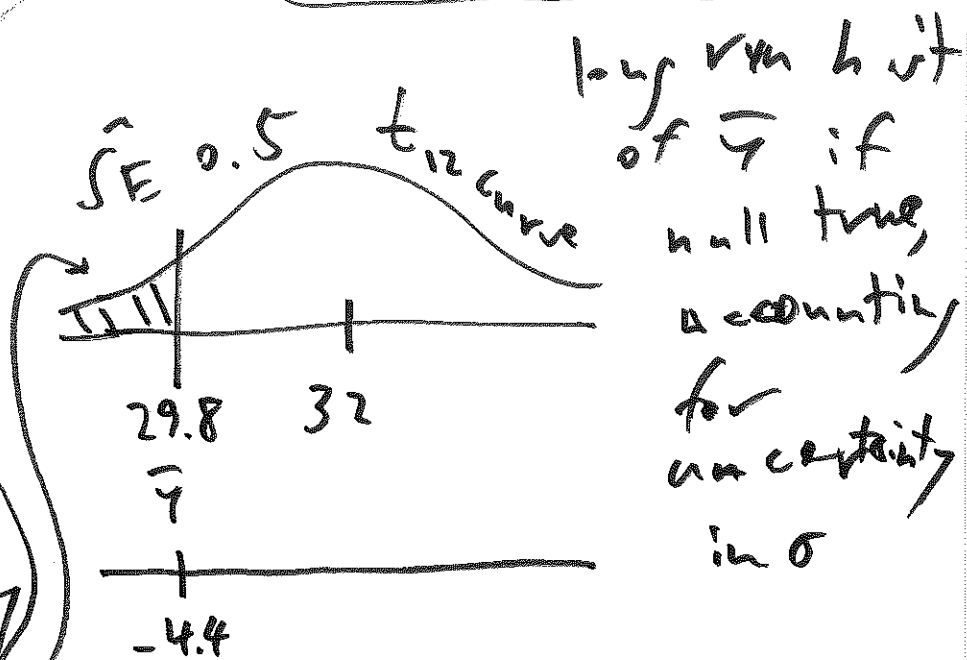
temporarily try null on far side

$$H_0: \mu = \mu_0 = 32$$

$$H_A: \mu < 32$$

one-sided alt.

if you were expecting 32
side or take
0.5, 29.8 would
be quite extremely
surprising



1-tailed test

$$t = \frac{\text{signal}}{\text{noise}}$$

$$= \frac{29.8 - 32}{0.5} = \frac{-2.2}{0.5} = -4.4$$

$$P < 0.005 = 0.5\%$$

JM 1-tailed
 $P = 0.0004 = 0.04\%$

if null true
all orthopedic
specimens similar
to the sampled
orthopedic

sample
the observed
av thro. p. ds

imag data
all possible
 \bar{y} s

calcium
N=?
(bip)

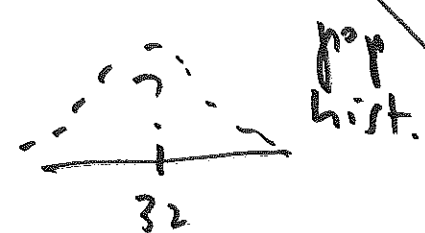
actual
life
SP
IID

calcium
h = 13
mean $\bar{y} = 29.8$
SD $s = 1.8$

29.8
29.6
.
.
.
M $\rightarrow \infty$

mean $\mu = ?$
SD $\sigma = ?$

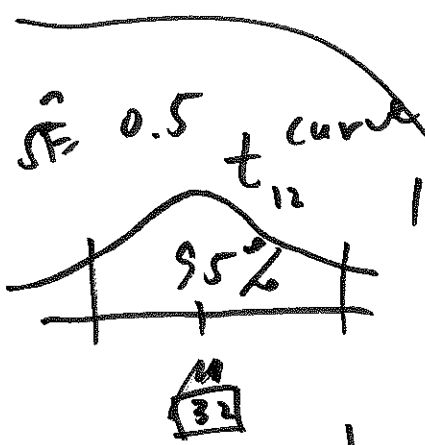
hypothetical
IID
sample
hist



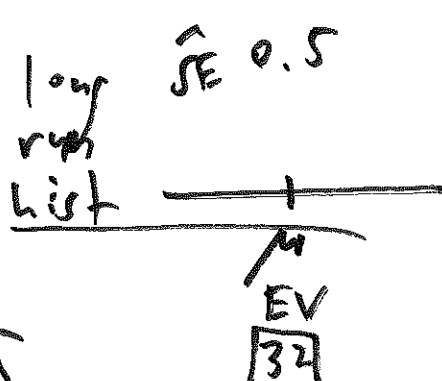
mean $\bar{y} = ?$
(ex. 29.6)
n = 13

long run
mean EV of \bar{y}
 $= \mu = 32$

long run
SD \hat{SE} of \bar{y}
 $= 0.5$



low run hist
of \bar{y} , accounting
for uncertainty in μ



this is an inference problem because \bar{y}
is known & μ is unknown

with $H_A: \mu \neq 32 \rightarrow$ 2-tailed

(3)

p-value =

$$2(0.00035)$$

$$= .0007$$

favor alternative
(reject null)

if p is small; here .00035

& .0007 are both tiny, so null

looks bad & theory looks wrong

theory
right

Disc. Sec. 6 problem (1)

p. R-66

ave weight new: 26.0 kg

5 yr: 28.1 kg
yo

or
weight
decline

in relative terms:

$$\frac{26.0 \text{ kg} - 28.1 \text{ kg}}{28.1 \text{ kg}} =$$

-2.1

new - old

$$\textcircled{-7.5\%} = -0.074 = \frac{-2.1}{28.1}$$

old

there was a 7.5% decline in mean weight for these otters over the last 5 years: (15) large in practical terms, because it accumulates over time

this pollen

involves 1-sample with continuous outcomes \leftrightarrow similar to intertidal crabs case study

(a) $\left(\overset{184}{L-185} \right)$ (9) T (we showed this earlier)

(b) (F) $26.0 \pm 4 \rightarrow 95\%$

(c) (F) \uparrow not 0.6

(d) (T) - we got this as our CI

(e) (T) - 28.1 is not in the 95% CI