

Discussion
Section,
week of
14-18 May

Disc. Sec 5 #2
p. 58-59

AM 57
14 May
18
①

imag dataset
all possible
 \bar{y} values

inference

sample
the observed
arthropods

pop
all arthropods
similar to
those in sample
↑ Calcium
↓
N=?

all relevant
ways
actual
like
IID

calcium
28
27
⋮
31
n=13

mean $\bar{y} = 29.8$
SD $s = 1.79$

29.8
30.1
⋮
M → ∞

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

hyp. IID



sample mean
hist.

low var

(EV)
expected
value of
 $\bar{y} = \mu$

pop hist.

h
n=13

est.
var
SD

std
standard error
of $\bar{y} = \frac{s}{\sqrt{n}} = \frac{1.79}{\sqrt{13}} = 0.50$

math fact

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

mean $\bar{y} = ?$
(ex. 30.1)

low var
hist

$\hat{SE} = 0.50$

*

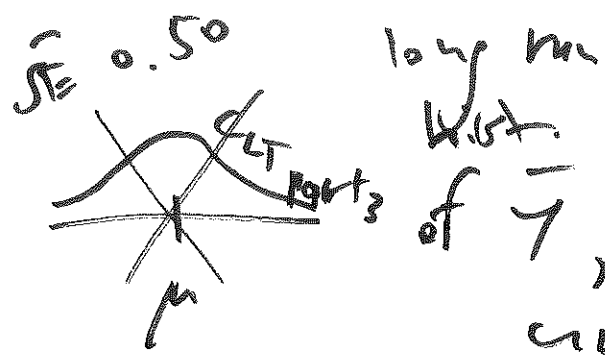
= μ

math fact
 $SE_{IID}(\bar{y}) = \frac{\sigma}{\sqrt{n}}$

$\hat{SE}(\bar{y}) = \frac{s}{\sqrt{n}} = \frac{1.79}{\sqrt{13}} = 0.50$

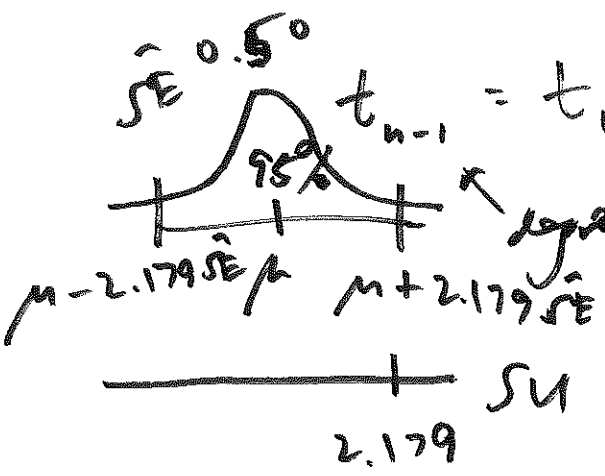
inferential summary

pop.	pop. quantity of main interest	$\mu =$ mean calcium in coelomic fluid of all pop. of this pop.
sample	our best estimate of	$\bar{y} = 29.8$
↑	size or take for \bar{y} as est. of μ	$SE(\bar{y}) = 0.50$
↓	95% conf. int. (CI)	$\bar{y} \pm 2.179 SE(\bar{y}) = (28.7, 30.9)$ $t_{n-1} = t_{n-1, 0.95}$ Gosset (1908)



large n
dist.

of \bar{y} , accounting for uncertainty in σ



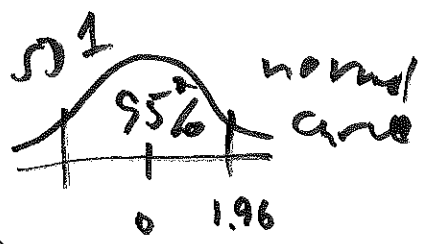
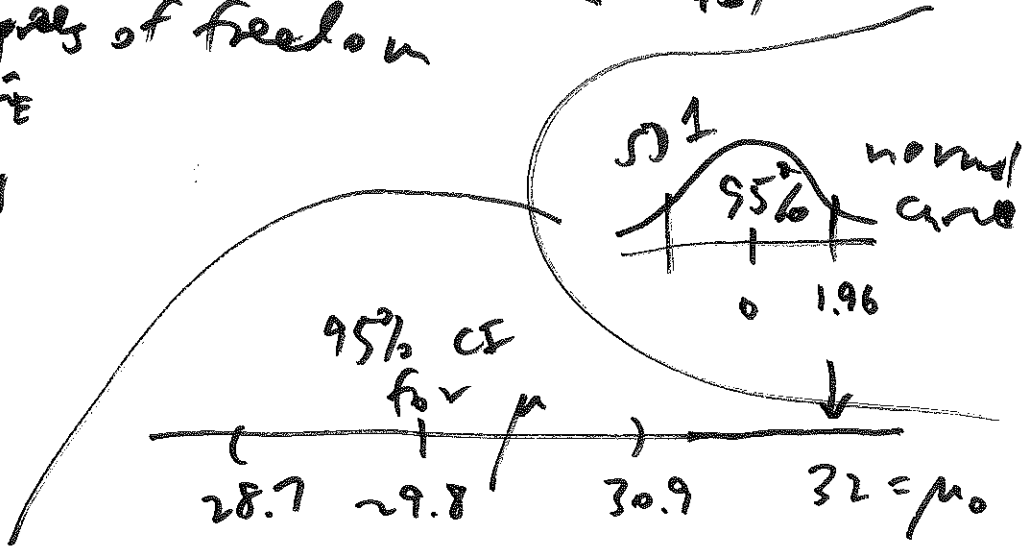
degrees of freedom

$t_{n-1} = t_{12}$ curve L-142

t table

2.179 SU

29.8 ± 1.09



$\mu_0 = 32$ is not in the 95% CI, so (3)
distance between $\bar{y} = 29.8$ &

$\mu_0 = 32$ is statistic \leftrightarrow hard to
attribute to unlucky random sampling

\leftrightarrow probably real