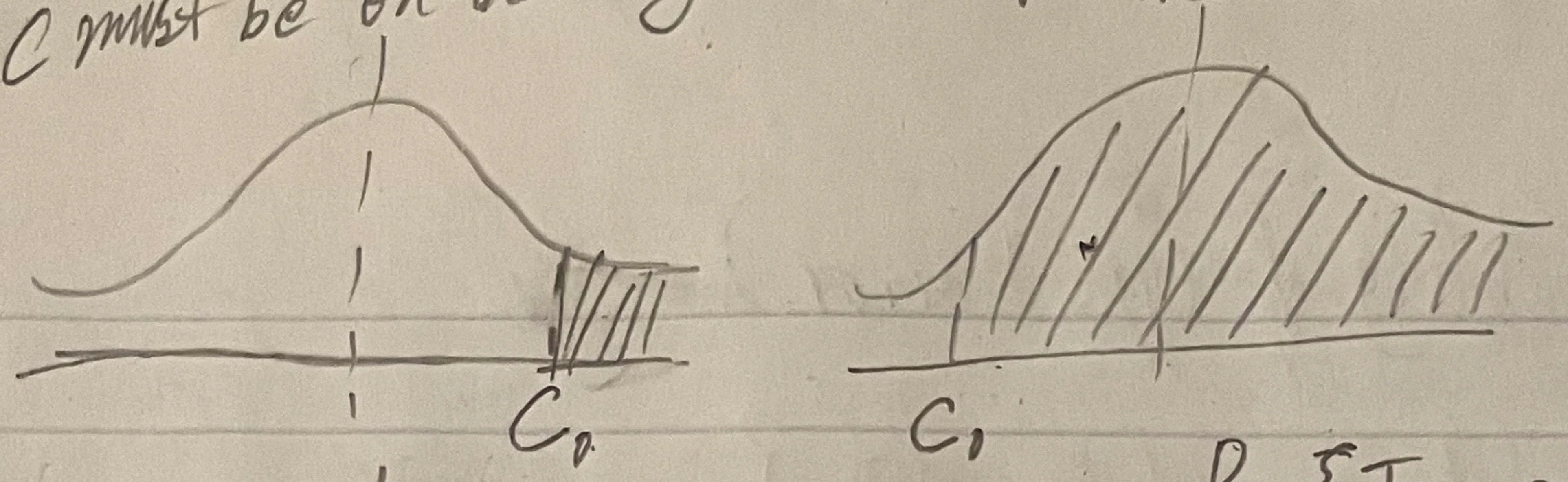
☆ additionally, we want $Pr\{T > c \mid \mu = 1.5\} \le 5\%$.

c must be on the right to make the draw area ~~has~~ small.



correct.

wrong. $Pr\{T > c \mid \mu = 1.5\} = 95\%$

in fact, we can choose any $c > c_0$ in the left graph —
as we slide c to the right from c_0, $Pr\{T > c \mid \mu = 1.5\}$ becomes less than 5%.

$H_0: \mu \le 1.5$

$H_1: \mu > 1.5$

$a = 0.5.$

$T = \frac{\bar{X} - \mu_0}{SE}$

a: the max probability of type I error.

μ: true population parameter.

$\mu_0 \le 1.5$.

critical region: a region that if $\bar{X}$ falls into, H_0 will be rejected.

shandowed area = rejection area

C = critical value.

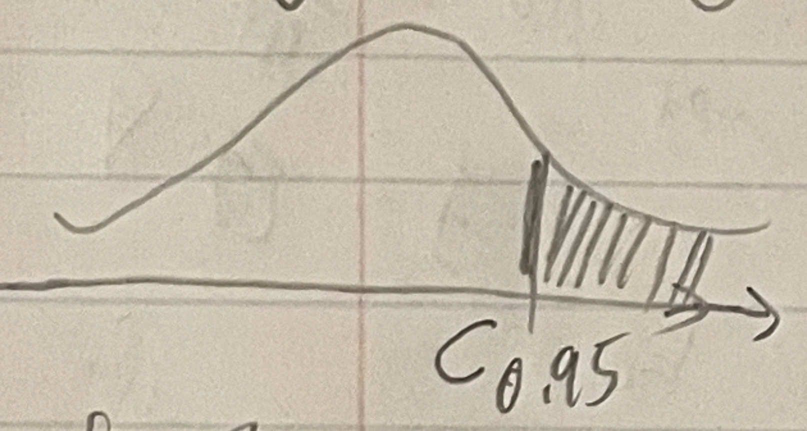
① measures how many standard errors $\bar{X}$ is from μ_0.

When T is positive and large, μ is much bigger than μ_0. (supports H_1)

When T is 0 or negative, μ is equal to or smaller than μ_0 (supports H_0)

② Direction of H_1: { on sided to the right ✓. (our case) ; on sided to the left

we only care large T, so define a critical region in the right of the sampling distribution. Since ~~regi~~ this region is on the right, the resulting region in $N(0,1)$ is also on the right.

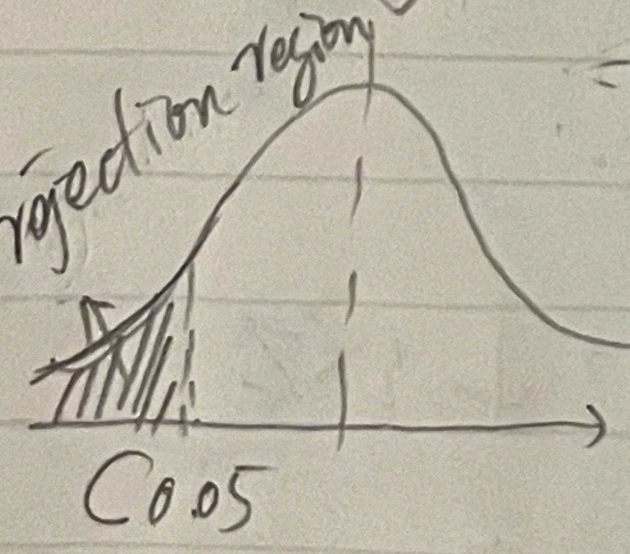


③. why choose $C_{0.95}$?

Because $C_{0.95}$ is a point that standardized $\bar{X}$ will fall to its left, so H_0 will not be rejected. Alternatively, 5% of standardized $\bar{X}$ will fall to its right, so that H_0 will be rejected even though we assume $\mu = 1.5$. ($T > C \Rightarrow$ reject).

④. Why shandow on the right? ① suppose the show is on the left.

on the left.



If standized $\bar{X}$ falls into the shandow, H_0 will be rejected. In other words, even $\bar{X}$ is much smaller than 1.5, we reject the hypothesis. This is wrong beacuse when we observe an small $\bar{X}$, this acctually supports H_0. ② Contradicting the significance level's definition: The standardized $\bar{X}$ now has 95% chance to fall into unshandowed area, in which, $T > C_{0.05}$, so H_0 will be rejected $\Rightarrow$ $a = 95\%$, not 5% now