

ECON221 Quiz 04 V26

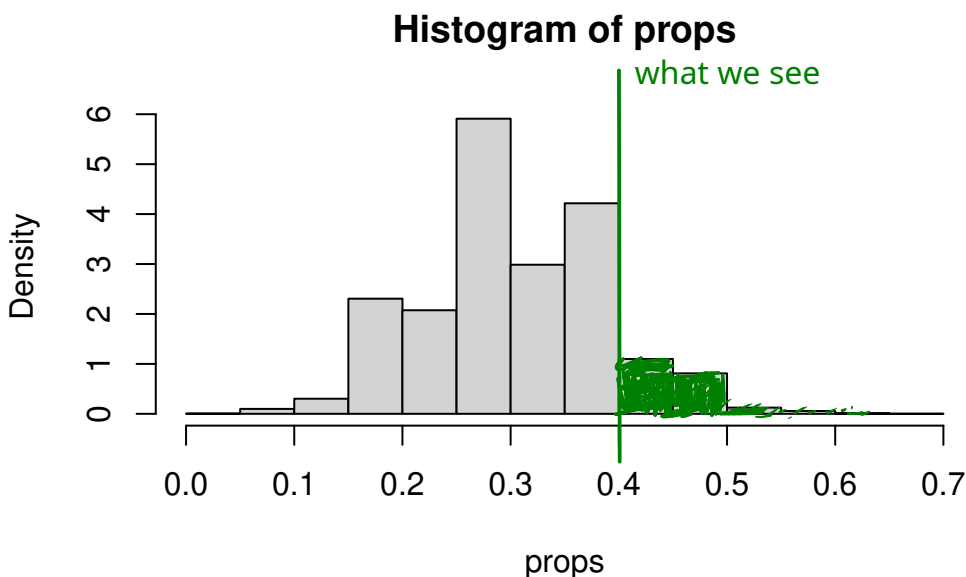
Assisted Reproductive Technology (ART) is a collection of techniques that help facilitate pregnancy. A 2008 report by the Centers for Disease Control and Prevention estimated that ART has been successful in leading to a live birth in 31% of cases. A new fertility clinic claims that their success rate is higher than average. A random sample of 30 of their patients yielded a success rate of 40%. A consumer watchdog group would like to determine if this provides strong evidence to support the company's claim.

1. (1 point) Write down the two claims to be evaluated.
2. (2 points) Consider the following R code. There are two blanks in the rbinom command.

```
nsim <- 10^4  
a <- replicate(nsim, rbinom(__(i)__,1,__(ii)__))  
props <- colMeans(a)
```

The correct values for (i) is 30 and for (ii) is 0.31 in order to evaluate which claim is supported by the data.

3. (2 points) Below is a histogram showing the distribution of the statistic of interest in 10,000 simulations under status quo. Shade the part of the histogram that you will be using to assess the claims. Label what needs to be labeled.



The area to the right of 0.4 is what we will be using to assess the claims.

1. We are evaluating two claims: (a) The success rate of the clinic in the long run is lower than what was reported in the 2008 report. (b) The success rate of the clinic in the long run is higher than what was reported in the 2008 report.

ECON221 Quiz 04 V27

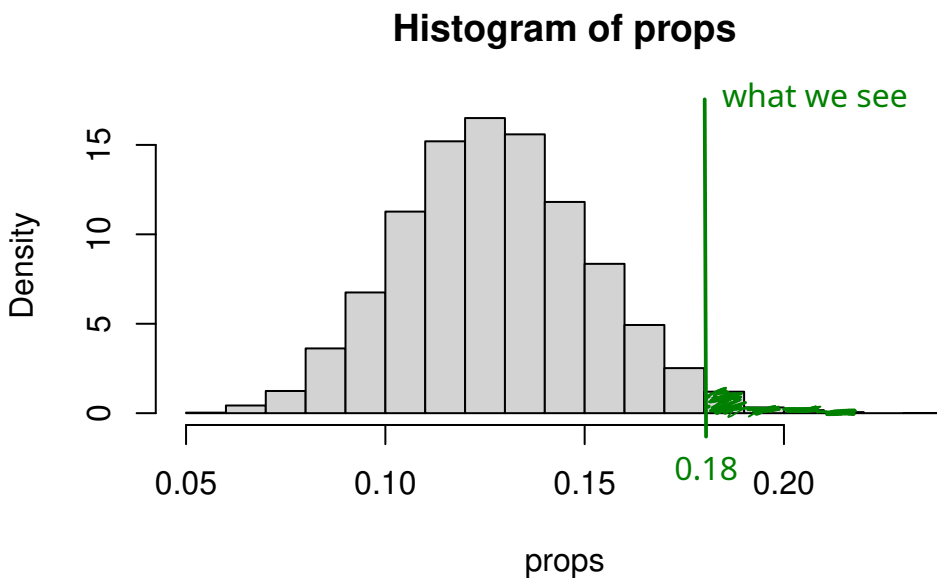
About 13% of the population is left-handed. A biologist suspects that the scientific community is not like the general population in terms of handedness. He asks 200 scientists and finds that 36, are left-handed. Does this data support the biologist's theory?

1. (1 point) Write down the two claims to be evaluated.
2. (2 points) Consider the following R code. There are two blanks in the rbinom command.

```
nsim <- 10^4  
a <- replicate(nsim, rbinom(__(i)__,1,__(ii)__))  
props <- colMeans(a)
```

The correct values for (i) is 200 and for (ii) is 0.13 in order to evaluate which claim is supported by the data.

3. (2 points) Below is a histogram showing the distribution of the statistic of interest in 10,000 simulations under status quo. Shade the part of the histogram that you will be using to assess the claims. Label what needs to be labeled.



The area to the right of 0.18 is what we will be using to assess the claims.

1. We are evaluating two claims: (a) Scientists are no different from the general population in terms of their handedness. (b) Scientists are different from the general population in terms of their handedness.

NOTE: This exercise actually does not have an indication of direction, e.g. scientists are more likely to be left-handed than the general population. Strictly speaking, we have to multiply the area by 2 to get the correct p-value for this situation. But the area to the right of 0.18 is acceptable.