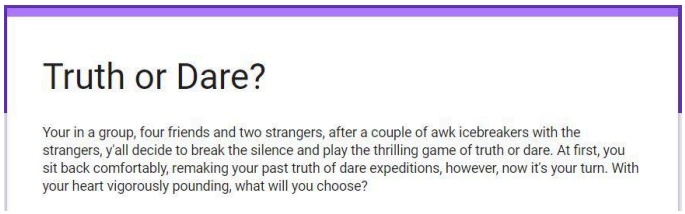
Introduction to Hypothesis Test

Pranay Rajpaul P.1

I decided to pick the causal, but daunting, game of Truth or Dare for my statistical research. Truth or Dare is a game/icebreaker where a group of participants take turns asking each other to pick from Truth or Dare, and respectively do a task relating to their choice. For my research, I decided to give a specific scenario to my random participants, as this would create no bias between responses, as well have individual psychological responses to the situation. So, with four friends and two strangers in a group, what will participants decide to choose.



Hypotheses & Conditions

H_0: $\rho = 0.5$
H_A: $\rho > 0.5$

Where ρ = proportion of high school students who choose truth over dare given the certain scenario. These results are being tested at the 5% level.

Conditions:

1) Random: Survey of 682 samples of high school students taken from an SRS. WIthout using an SRS, there would be a possibility where participants would respond depending on their thoughts about me, creating a biased sample distribution. ✓
2) Independent: I am taking a random sample without replacement, meaning that 10% of my sample size must be larger than the entire high school population of USA. Because there are over 100,000 high school students in USA, and my sample contains 682 participants, which is lower than 10% of the entire high school student population, I can assume this. ✓
3) Normal: $n(\rho_n) > 10$ && $n(1-\rho_n) > 10$ || $682 \times 0.5 > 10$ && $682 \times (1 - 0.5) > 10$ || $341 > 10$ && $341 > 10$ ✓

Participants & Sampling Method

I utilized Google Forms to create an anonymous survey link to my statistical research question. This form doesn't ask for any identification, to keep bias at a minimum; it just contains the scenario they are placed in, as well as two response options, Truth or Dare. I sent this survey out, using multiple, anonymous public media distribution techniques, to gain my 682 responses.

I received 682 anonymous, bias free, responses from high school students across USA.

Analysis of Data

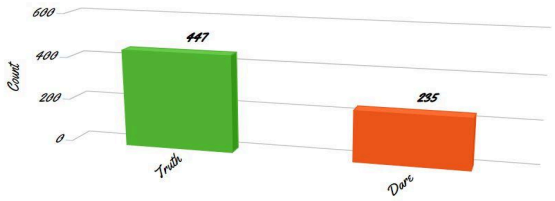
$\alpha = .05$

$\hat{P} = \frac{447}{682}$

Test Statistic: $z = \frac{\frac{447}{682} - 0.5}{\sqrt{\frac{0.5 \times 0.5}{682}}} = 8.118$

P-value: $normalcdf(8.118, \infty, 0, 1) = 2.40 \times 10^{-16}$

P-value < α



Final Conclusion in context

I have enough evidence to reject my null hypothesis, since the p-value is less than alpha value. There is sufficient evidence to state that at the five percent level, a greater proportion of high school students choose truth over dare, supporting the alternate hypothesis.