STAT 113: RANDOMIZATION DISTRIBUTIONS AND P-VALUES

"Love is Blind" (Males)

Each of 18 male adults in relationships with female partners was asked to touch the backs of the hands of three female adults, one of whom was the participant's romantic partner, while blindfolded. The two "decoys" were the same age, height, and weight as the participant's partner. Of the 18 participants tested, 8 were able to correctly identify their partner. The question of interest is: Does the data provide sufficient evidence that members of the target population are able to sense their partners better than guessing would predict?

(1) What is the response variable here?

(2) What is the target population here? What is the population parameter of interest?

(3) What sample statistic is used to estimate the population parameter? What is the sample size?

(4) What are the null and alternative hypotheses, in words? What are they in terms of the population parameter?

(5) Your group has three cards, two of which are black and one of which is red. We can simulate random guessing by drawing a card at random from the three possibilities, supposing that the red card represents the participant's partner and the two black cards are the decoys. Choose one group member to be the shuffler, and one to be the picker. Have the shuffler fan out the cards so their backs are to the picker, and let the picker select a card. Write down its color. Repeat this a total of 18 times, representing the 18 participants, with the shuffler mixing up the cards between each draw.

Trial #	Color	Trial #	Color
1		10	
2		11	
3		12	
4		13	
5		14	
6		15	
7		16	
8		17	
9		18	

(6) Total up the number of draws where the picker selected the "correct" (red) card. Place a dot on the board representing the number of correct picks.

(7) What proportion of the time did the proportion of correct responses under the "random picks" model equal or exceed the actual proportion correct in the data?

(8) If we had simulated several thousand trials instead of just a few, this proportion would be the P-value. For stronger evidence that the participants in the study were *not* guessing randomly, should the P-value be smaller or larger? Explain the reasoning behind your answer.

(9) Go to `http://lock5stat.com/statkey/` and select "Sampling Distributions (Proportion)". Select "Edit Proportion" and enter the hypothetical population proportion under H_0. Select the appropriate sample size under $n =$. Simulate several thousand samples. Select either the left-tail, right-tail or two-tail checkbox to highlight the part of the distribution that provides the strongest evidence against H_0 in favor of the alternative hypothesis. Change the cutoff to 8, representing the observed number correct. What is the P-value?