**Do People Tend to Favor Rock in a Battle of Rock-Paper-Scissors?**

1. In general, if individuals were randomly choosing what to “throw”, what proportion of people would lead a game of Rock-Paper-Scissors with a rock?
2. If people tend to favor starting with rock, what does that imply about how the proportion of games in which rock is thrown first (i.e., *p*) compares to the value chosen in Question 1?

1. Suppose we observe a random sample of 119 games and find that 66 people played rock first. If individuals were randomly choosing, how likely is it to have at least 66 out of 119 games in which “rock” is thrown first?  
   1. If individuals are choosing at random, identify the sampling distribution for the proportion of games in which rock is thrown first.

* 1. Using the distribution from part a, determine how likely it is to have at least 66 out of 119 games (our observed sample outcome) in which rock is thrown first.

This is our approximate answer for the question “If individuals are throwing rock at random, how likely are we to get at least 66 out of 119 games where rock is thrown first, just by random chance?”. Note that this is the **p-value** in a test of significance.

1. Based on this approximate **p-value**, do you believe that people are randomly throwing rock on their first round of Rock-Paper-Scissors? If not, what do you believe is happening?

**Null and Alternative Hypotheses**

1. A governor is concerned about his “negatives” – the percentage of state residents who express disapproval of his job performance. His political committee pays for a series of TV ads, hoping that they can keep the negatives below 30%. They will use follow-up polling to assess the ads’ effectiveness.

1. Only about 20% of people who try to quit smoking succeed. Sellers of a motivational app claim that listening to the recorded messages can help people quit.

1. In the 1950s 40% of high school graduates went on to college. Has the percentage changed?

1. 20% of cars of a certain model have needed costly transmission work after being driven between 50,000 and 100,000 miles. The manufacturer hopes that a redesign of a transmission component has solved this problem.

1. Is a coin unfair?

1. We field-test a new-flavor soft drink, planning to market it only if we are sure that over 60% of the people like the flavor.