

Additional Simulation Question: *Feel the Power*

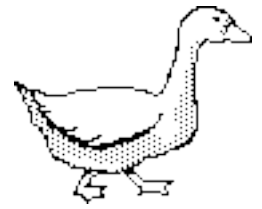
Does power corrupt decision making? “Absolutely” according to an article in *The Economist* (January 23-29, 2010). In an experiment described by the article, a group of 15 volunteers were primed to feel powerful and then asked to roll two 10-sided dice (each having sides 0-9) and combine the results to form a number between 01 and 100 (letting 00 = 100). After rolling the dice in a secluded area, the subjects were asked to report the number they rolled. This number would determine the number of tickets they would receive for a raffle at the end of the study. The mean of their rolls was 70, much higher than the expected value of 50.5. Does this provide convincing evidence that the subjects were lying or could they have obtained a mean this high by random chance?

- (a) Design and carry out a simulation to estimate the probability that the mean value for 15 honest subjects would be at least 70, assuming that the subjects were told to roll the dice one at a time and use the first roll for the tens digit and the second roll for the ones digit.

- (b) Suppose that the subjects were not told which die to use for the tens digit and which die to use for the ones digit. Design and carry out a simulation to estimate the probability that the mean value for 15 honest subjects would be at least 70, assuming that the larger die roll would be used for the tens digit.

Additional Simulation Question: *The Duck Hunters*

There are 10 fraternity brothers at a shooting gallery at the State Fair. Each brother is a perfect shot, meaning that they never miss the target they are aiming at. Ten cardboard ducks appear simultaneously, and each shooter picks one of the ten ducks at random, takes one shot, and hits his target.



- (a) Design and carry out a simulation to estimate the average number of ducks hit and the probability that more than half of the ducks get hit.
- (b) Suppose that 10 more perfect shots join the fun so that there are 20 shooters. What do you think will happen to the values you estimated in part (a)? Design and carry out a simulation to see if you are correct.

Additional Simulation Question: *Airline Overbooking*

Mudlark Airlines has a 15-seater commuter turboprop that is used for short flights. Their data suggest that about 8% of the customers who buy tickets are no-shows. Wanting to avoid empty seats and avoid missing an opportunity to increase revenue, they decide to sell 17 tickets for each flight. Ticketed customers who can't be seated on the plane will be accommodated on another flight and will receive a certificate good for a free flight at another time. Design and carry out a simulation to estimate the probability that at least one ticket-holder is denied a seat on the plane if 17 tickets are sold.