DO NOW

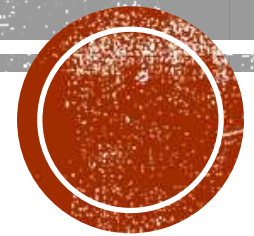
The cost of a meal might affect how customers evaluate and appreciate food. To investigate researchers worked with an Italian all-you-can-eat buffet to perform an experiment. A total of 139 subjects were randomly assigned to pay either $4 or $8 for the buffet then asked to rate the quality of the pizza on a 9-point scale. Subjects who paid $8 rated the pizza 11% higher than those who only paid $4. Describe how the researchers could have randomly assigned the subjects to treatments using:

a) Identical slips of paper

b) Random-number generator

LESSON 3.8

Inference for Experiments



OBJECTIVE

- Outline an experiment that uses a completely randomized design.
- Explain the concept of statistical significance in the context of an experiment.
- Use simulation to determine if the difference between two means or two proportions in an experiment is significant.

SOLUTION 1

20 students were randomly chosen from the population of seniors, they were randomly assigned to group 1 or 2. Group 1 used the long putter and group 2 used the short putter. The average distance from the hole was compared.

SOLUTION 2

- The average distance away from the hole for the short putter was 2.9cm more than the long.

FLIP OVER TO THE BACK

HOW DO WE KNOW IF THIS DIFFERENCE IS BIG ENOUGH?

For example, if the difference were only 1 cm, would that be enough?

What if it were 10 cm?

We will assume the putter length has no impact on the putt.

Take the person who putted 2 cm from the hole with the short putter, perhaps they would have been 2 cm away no matter which putter they used.

You will be given a set of 20 cards, one for each putt.

Write the distances of the putts on the cards, shuffle the cards and split them in to two groups. Assign one group as the short putts and the other group as the long putts and then find the difference in means.

Put your difference on the dotplot on the board

STEP 4: MAKE A DECISION

It is due to the treatment. From our simulation we found it was very unlikely that we get a difference greater than or equal to 2.9 purely by chance.

IMPORTANT IDEAS FROM THE TEXT

- Completely Randomized Design
  - Random assignment
  - Size of groups with treatment
  - Response Variable

IMPORTANT IDEAS FROM THE TEXT

- **Statistical Significant Differences** between groups are too large to have happened by chance. (i.e. Statistically Significant)

- We will use the 5% cutoff for statistical significance.
- So differences that would occur less than 5% of the time by chance alone are considered statistically significant.

IMPORTANT IDEAS FROM THE TEXT

- **Statistical Significant Differences** between groups are too large to have happened by chance. (i.e. Statistically Significant)

- Use stapplet to simulate many studies. Check % of our dot ≥ our value.
  - 5% cutoff