

Math Virtual Learning

AP stats / Collecting Data

May 4th , 2020

Lesson: April 28, 2020

Objective/Learning Target:

Students will review correct procedures for sampling, surveys, and experiments

Review 1

A doctor wishes to compare the resting heart rates of his younger patients versus his older patients. Which of the following graphical displays is inappropriate?

- a. Back to back stemplots
- b. Parallel boxplots
- c. Side by side histograms
- d. Scatterplot
- e. All the above displays are appropriate

Review 2

Which of the following are true statements about the correlation coefficient r ?

1. It is not affected by changes in the measurement units of the variables.
2. It is not affected by which variable is called x and which is called y
3. It is not affected by extreme values.

Answers

#1. A, B and C are appropriate as they can compare two separate populations. However, a scatterplot does not compare separate populations, but related variables. If we had heart rates of say father and son pairs then the scatterplot could be used.

#2. Since r is measuring how closely the points follow the model, changing the explanatory and response variables keeps the same pattern so the same r . Changing the units also does not change the pattern. However, extreme values, both outliers and influential points affect the fit of the model and thus change r .

Study design

Recall that most studies we talk about in AP stats fit neatly into one of two categories. They are either observational studies (including surveys) or experiments. Choosing one over the other affects the type of conclusions we can make. Causal inferences (x causes y) require controlled experiments. Inferences about populations require random sampling. Here we will review the different types of studies. Please watch and follow along with the following videos.

[Collecting Data - Sampling and Experiments](#)

Extra Practice - [Answers here](#)

2019 AP® STATISTICS FREE-RESPONSE QUESTIONS

2. Researchers are investigating the effectiveness of using a fungus to control the spread of an insect that destroys trees. The researchers will create four different concentrations of fungus mixtures: 0 milliliters per liter (ml/L), 1.25 ml/L, 2.5 ml/L, and 3.75 ml/L. An equal number of the insects will be placed into 20 individual containers. The group of insects in each container will be sprayed with one of the four mixtures, and the researchers will record the number of insects that are still alive in each container one week after spraying.
- (a) Identify the treatments, experimental units, and response variable of the experiment.
- Treatments:
- Experimental units:
- Response variable:
- (b) Does the experiment have a control group? Explain your answer.
- (c) Describe how the treatments can be randomly assigned to the experimental units so that each treatment has the same number of units.