

End of Module 5 Study Guide

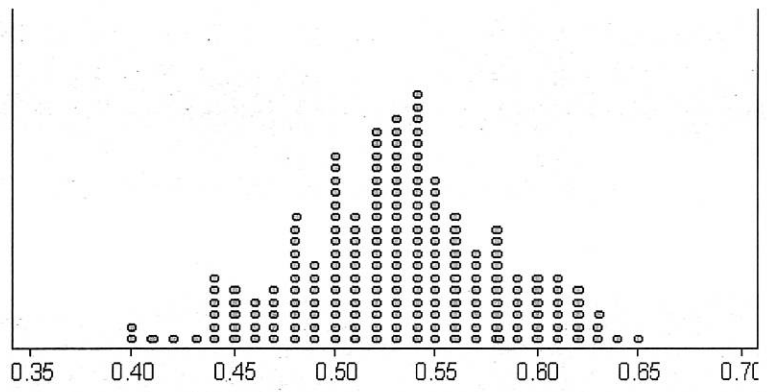
SHOW ALL WORK

1. You and a friend decide to sample some books from the library to determine the average Lexile level. You ask the librarian for a list of the last 75 books that were checked out and sample those. Your friend obtains a numbered list of all books and selects numbers out of a bag to determine which 50 to sample.

a. Which person do you believe is more likely to collect data that is more representative of all the books in the library? Explain your choice.

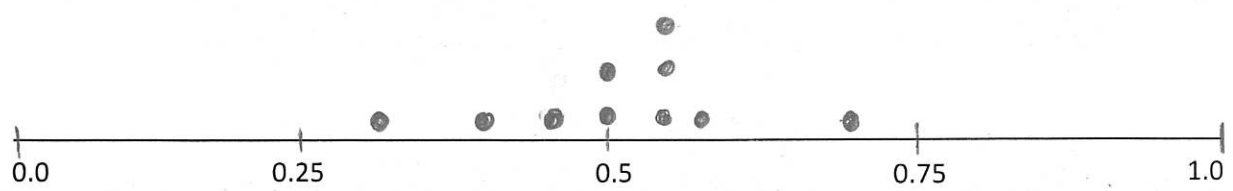
Your friend's sample will be more representative because it represents a random sample. The last 75 books checked out may be skewed as it could represent books checked out to only a certain grade level.

2. The below dot plot represents 150 different random samples of 50 students at PCA. (Number of samples = 150, sample size = 50) Each dot represents the mean of 1 sample of size 50.



Sample Proportion that want breakfast for lunch every Friday

Suppose 10 people each take a random sample of 10 students and calculate the proportion in the sample want breakfast for lunch every Friday. On the dot plot axis below, place ten values that you think are most believable for the proportions you could obtain. Explain your reasoning.

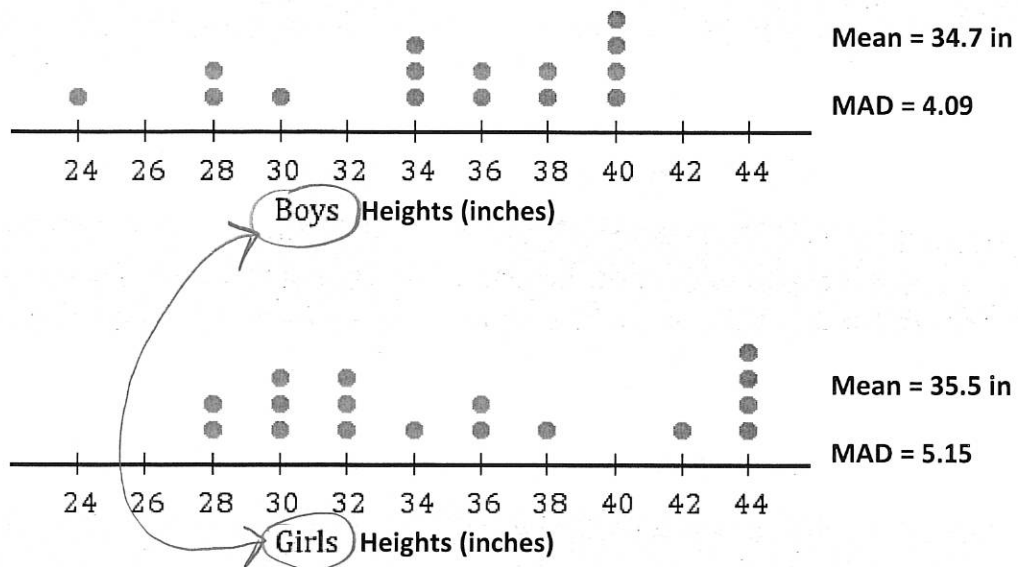


Sample Proportion that want breakfast for lunch every Friday

[Additional answer space for #2]

The values will still center around 0.53, however will tend to be more spread out than in the original plot where samples had 50 students.

3. Boys and girls measured their heights and plotted the results on the graphs below.



Based on the above data, do you think there is a difference between the population mean height for boys and the population mean height for girls? Justify your answer.

No, the height difference is not significant as the mean heights are only 0.8 inches different. The range for the boys is 28-44, while the range for the girls is 24-40. Much of the data is overlapping.

The number of MADs by which they differ is not significant.

$$\frac{35.5 - 34.7}{5.15} = 0.16$$

(< 2)

4. A customer purchases a bag of individually packaged cheese crackers, and finds that after opening the large bag, one of the smaller bags inside is not sealed properly. The customer wonders how unlikely it is to randomly find a bag that is not sealed.
- a. If the large bag contains 14 smaller bags of cheese crackers, estimate the probability of this company producing a bag with a seal issue.

$$\frac{1}{14}$$

- b. Suppose the cracker company claims that 99% of all the bags they produce are sealed properly. Explain how you could simulate randomly selecting 14 bags from such a population to determine how many of the sampled bags were not sealed properly. Explain the details of your method so it could be carried out by another person.

Have a bag of 100 counting chips, 99 of which are yellow and represent bags that are properly sealed and 1 which is red and represents bags that were not properly sealed. Pull out a chip, record its color, and put it back. Do this 14 times and count how many are not yellow.