

Math 7H - Unit 6

Day 11 - Visual Overlap

Lesson Objectives:

- I can informally assess the degree of visual overlap of two numerical data distributions with similar variabilities.
- I can measure the difference between the centers of two numerical data distributions by expressing it as a multiple of a measure of variability.

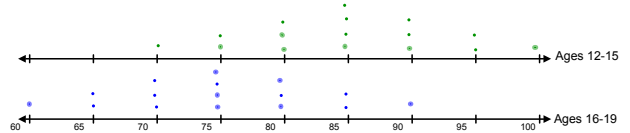
You can compare two numerical data sets by comparing the shape of their distributions. The **visual overlap** of two distributions with similar variation is a visual demonstration that compares their centers to their variation, or spread.

A survey was done. The tables below show the number of text messages sent and received daily for two different age groups.

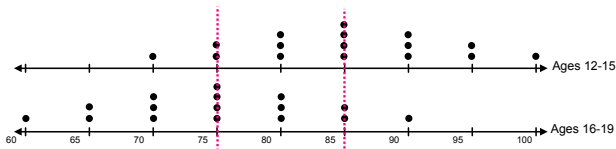
| Text Messages Ages 12-15 | | | | | Text Messages Ages 16-19 | | | | |
|--------------------------|----|----|----|--|--------------------------|----|----|----|--|
| 70 | 90 | 80 | 90 | | 85 | 75 | 80 | 70 | |
| 85 | 75 | 85 | 80 | | 75 | 80 | 65 | 75 | |
| 90 | 80 | 75 | 95 | | 85 | 70 | 90 | 80 | |
| 100 | 85 | 95 | 85 | | 70 | 75 | 60 | 65 | |

Create a double dot plot to display the data in each table.

Text Messages Sent and Received



Text Messages Sent and Received



Find the mean number of text messages for each age group.

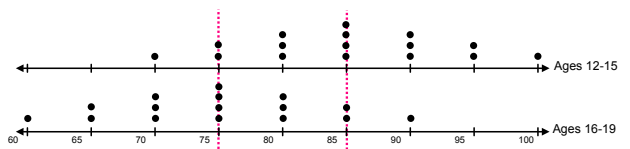
$$\text{Ages 12-15 mean} = 85 \quad \text{Ages 16-19 mean} = 75$$

Find the mean absolute deviation for each age group.

$$\text{Ages 12-15 MAD} = 6.25 \quad \text{Ages 16-19 MAD} = 6.25$$

Move one of the pink dotted lines so it goes through the mean for ages 12-15. Move the other pink dotted line so it goes through the mean for ages 16-19. The dotted lines show the visual overlap between the centers.

Text Messages Sent and Received



What is the difference between the means of the two populations?

$$85 - 75 = 10$$

Write the difference between the means and the mean absolute deviation as a ratio (fraction).

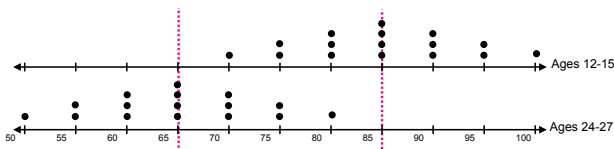
$$\frac{10}{6.25} = \frac{8}{5}$$

Write the ratio as a decimal.

$$1.6$$

The double dot plot below compares the number of text messages sent and received by a third age group to the age group, 12-15 years.

Text Messages Sent and Received



Find the mean number of text messages for the third age group.

$$\text{Ages 24-27 mean} = 65$$

Find the mean absolute deviation for the third age group.

$$\text{Ages 24-27 MAD} = 6.25$$

Write the difference between the means and the mean absolute deviation as a ratio (fraction).

$$\frac{20}{6.25} = \frac{16}{5}$$

Write the ratio as a decimal.

$$3.2$$

Compare the two ratios that you've written.

$$\frac{8}{5} \\ 1.6$$

$$\frac{16}{5} \\ 3.2$$

What does the ratio $\frac{\text{difference in means}}{\text{mean absolute deviation}}$ tell you about how much visual overlap there is between two distributions with similar variation?

Homework

Visual Overlap WKS

* Individual Think Time *



What to do if you get stuck...

1. Reread the problem. Did you write it down correctly?
2. Reread your notes. Is there a problem similar that we did together in class?
3. Find a problem similar in your book. Try this one to see if it helps.
4. Skip the problem until the end of Individual Think Time. Then ask an "educated" question of a neighbor or Mrs. Call.

Today we're working by...

