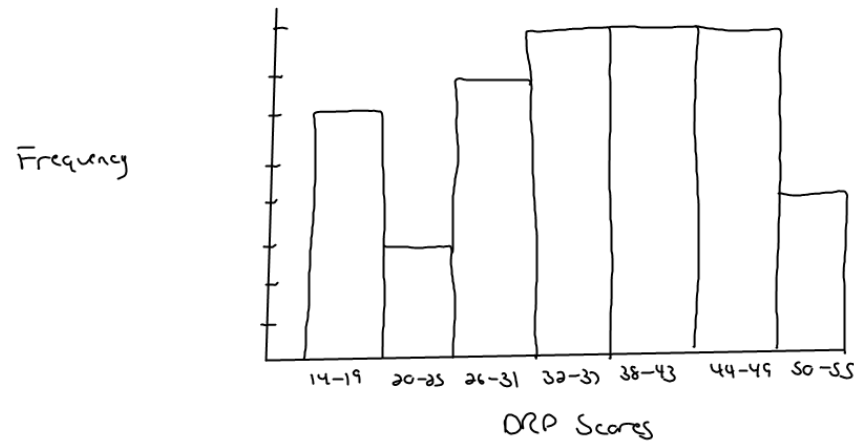


52 SS 59 60

ss)

	14	54	40			
	min	max	Range	6 width		
	14-19	20-25	26-31	32-37	38-43	44-49 50-55
	1		11	111	111	111



slightly skewed left
no outliers
mid 30's center
14-54

ss)

right skewed
no obvious outliers
center about 4
1 to 12 or spread is 11

6)

both skewed right
Yankees 8,000,000 Phillies 4,000,000
Yankees have a potential outliers Phillies do not
0 to 36,000,000 0 to 16,000,000

1/3

Describing Distributions with Numbers

Two Measures of Center

1) Mean

2) Median

Mean

 \bar{x}

$$\bar{x} = \frac{x_1 + x_2 + x_3 + \dots + x_n}{n}$$

$$= \frac{1}{n} \sum x_i$$

↑
summation

Bobo Ruth

54 59 35 41 46 25 47 60 54 46 49 46 41 34 22

$$\bar{x} = \frac{54 + 59 + 35 + \dots + 22}{15} = 43.9$$

Roger Marris

8 13 14 16 23 26 28 33 39 61

$$\bar{x} = \frac{8 + 13 + 14 + \dots + 61}{10} = 26.1$$

Weakness of Mean

- sensitive to the influence of outliers

- take out 61 from Roger Maris

$$\bar{x}_{w/61} = 26.1 \quad \bar{x}_{w/o 61} = 22.2$$

- extreme example

10 10 10 10 10,000

$$\bar{x} = \frac{10040}{5} = 2008 \quad \text{median} = m = 10$$

* not resistant

- mean is not resistant to outliers

- outliers pull the mean in the direction of the outlier.

right skewed
mean is higher



left skewed
mean is lower



Median m

- midpoint of the distribution
- 50th percentile
- half data below; half data above
- put data in numerical order

Bebe Ruth ($n=15$)

22 25 34 35 41 41 46 46 46 47 49 54 54 59 60

7 below

7 above

m

Roger Morris ($n=10$)

8 13 14 16 23 | 26 28 33 39 61

m

$$m = \frac{23+26}{2} = \boxed{24.5}$$

Strength of median

resistant measure to outliers

what if I put 610 instead 61

- median unchanged
- mean huge change

10, 10, 10, 10, 10

$$\bar{x} = 10$$

$$n = 10$$

10, 10, 10, 10, 10,000

$$\bar{x} = 2008$$

$$n = 10$$

Player Agent vs 6m

What measure of center would each
want to use in negotiations?