

Does Beyonce write her own lyrics?

Bey

BEYONCÉ

CRAZY IN LOVE

"'Crazy in Love' was really hard to write because there was so much going on ... I mean, I had written — what? — seven, eight number one songs with *Destiny's Child*, in a row." Beyonce, *Vanity Fair*

We can use statistics to help determine whether or not Beyonce wrote the song "Crazy in Love". If we can find the average word length from the song, we can compare it to the average word length for songs that we know for sure were written by Beyonce.

1. Quickly circle a random sample of 5 words from the song. Write them below. How many letters in each word?

name, hoping, friends, you, thought
 (4) (6) (7) (3) (7)

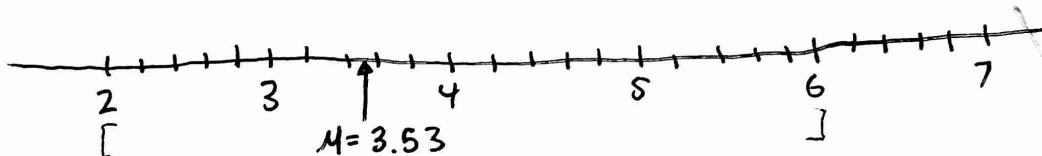
$$\frac{27}{5} = 5.4$$

2. What is the average word length of your sample? $\bar{x} = 5.4$.

3. Put your average on the dotplot on the white board at the front of the room. Copy the class dotplot below.

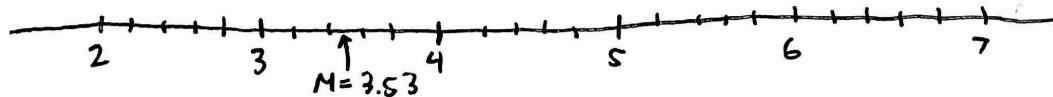
HIGH BIAS

NOTE:
TRUE MEAN
WORD LENGTH
IS 3.5315



4. Find a new sample of 5 words using a random number generator. Put your average on the dotplot on the white board at the front of the room. Copy the class dotplot below.

LOW BIAS

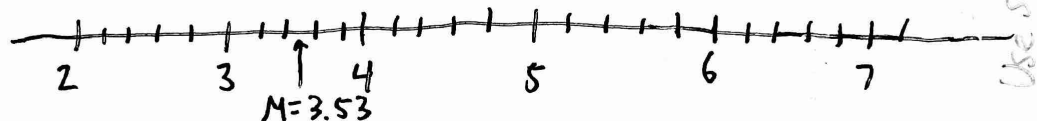


5. How is the dotplot from #4 different than the dotplot for #3?

In the first dotplot, we consistently overestimated the true mean. (HIGH BIAS)
 In the second dotplot, some samples gave overestimates and some gave underestimates. (LOW BIAS)

6. Take a random sample of 10 words from "Crazy in Love". Find the average of your sample and put on the dotplot at the front of the room. Copy the dotplot below.

LOWER
VARIABILITY



7. What happens to the dotplot when we increase the sample size?

variability decreases!

GOOD STATISTIC

- ① Low bias (accurate)
- ② Low variability (precise)

8. It is a well known fact that Beyoncé wrote the lyrics for all of the Destiny's child songs. The average word length for these songs is ^{3.64}~~3.64~~ letters. Based on your samples, do you have good evidence that Beyoncé did not write the lyrics for "Crazy in Love". Explain.

No. The average word length for Crazy in Love is 3.53 which is fairly close to the average word length for all the Destiny's Child songs (3.64).