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SPEAKERS

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Hello, and welcome back. In this video, we're gonna continue talking about the difference between the median and the mean. And we're also going to introduce the mode our last measure of central tendency. In our previous video, we looked at how the median was insensitive to extreme values, while the mean was sensitive to extreme bias. Now we can look back at some of the examples we saw earlier, and compare the mean and the median to see this. So if we take a look at our Toronto Raptors salary, this is the rounded salary of all the players who played for the raptors in 2021-2022, according to I believe, their average salary, or the average salary on their contract, and we can see that we've got a very extreme value here. Pascal Siakam. And if we look at the mean salary of the raptors, we see that it's 8.5 million. We saw that earlier. But what about the median salary? Well, turns out that the median salary is quite a bit less. And it looks like there's a little typo on this slide here. The median salary for the Toronto Raptors is actually 2.0 million $2 million if we're rounding to the closest million. And you can see that if you're playing for the Toronto Raptors and NBA team, you see the our average salary is 8.5 million. And that sounds pretty good. But if we look at the numbers, out of 19 players, only five of them are making more than $8.5 million dollars. Most players who play for the Toronto Raptors are making less than that. And the mean is captures better the idea that most players on the Toronto Raptors are not making 8.5 million, they're actually making somewhere between a little less than 1 million and 3 million, which we can see right here. Another way to think about this is that you might be interested in the mean salary, especially if you're looking at salary cap implications these professional sports teams have to deal with. But if there was a chance that you were randomly, you had a chance to be a random Toronto Raptors basketball player, and you were just as likely as being Pascal saya cam, as you were being one of the players over here. Then the median is going to give you a more accurate measure of the typical the salary of a typical NBA basketball player, or at least a Toronto Raptors basketball player. Here we can take a look at the Toronto Maple Leafs we can see the histogram and the stem and leaf plot for the players. We saw before that the mean salary of a Toronto Maple Leafs hockey player was $3.23 million per year. But if we look at the median salary of a Toronto Maple Leafs player, it's also less than the mean, it's 1.5 5 million. So the median is here, the median is the point at which half the values are going to be below that point and half the values are going to be above. But our mean was a little bit further to the

right. And the mean says that if we take all the weighted values of the players below the mean, so that it's equal to those players who are above the mean, then you can see that the mean is going to be quite a bit higher than the medium. Why is it relevant? Well, if you were just to pick one Toronto Maple Leaf player out of a hat, you're more likely to get a player who's making less than 3.2 3 million than to pick out a player who's making more than $3.23 million. Now our last measure of central tendency, our last average is called the mode. And the mode is the value that occurs most often. So sometimes when we think of the mode, we think of French, we think of things that are popular, maybe even think of pie with ice cream. But specifically in mathematics, the mode is the value that occurs most often. There are various ways to see this, if we've got categorical data, and we're looking at the number of abilities, these are cleared crimes in the city of Toronto. So clear crime is one that the police believe they have solved, whether they pressing charges, or they find out that say, maybe it was auto theft, but turns out that it wasn't really auto theft, there was the person in questions neice, who wanted to take the car out for the weekend. These are crimes that have been reported, and that have been cleared or in a more common language, maybe we can think of them as being solved one way or the other. If we want to find the mode crime, we're looking for the crime that occurs most often. And so the way that this bar graph is showing us the data, it's pretty clear that fraud is the mode. So all these four crimes committed in the city of Toronto, or I should say, Are these crimes that have been cleared in the city of Toronto in 20. Fraud is the most fraud fraud is the most likely one, if you were to have a hat filled with all these crimes, and you've picked one crime out of the hat, it's most likely to be fraud. Here is our Toronto Maple Leaf salaries. So we've got our player salaries, we've got our histogram on the left, and we've got our stem and leaf plot on the right. What is the mode here? So let's take a look at this. And it's giving us a little more detail in the histogram. And we can see that we've got three sevens here. We've got four nines, two twos, two fives, two sixes. Two zeros there. And what's the mode? Well, the mode salary is going to be 0.9. million US dollars, because there's four nines right here 0.9. There's only three sevens. And there's a few other salaries that are there are two of them. But there's only one salary 900,000 where there are four of them. So if you put all the Toronto Maple Leafs salaries into on a rewrote them down on a piece of paper, put the pieces of paper in a hat. If you do in a random draw, which salary you most likely to pull out of the hat was going to be 900,000, you're more likely to pull out 900,000, then you are to pull out 11 million, or 7 million. And so we could write the mode again, down here. And you can see that the mode is probably the least popular of the mean, median and mode of our measures of central tendency. But it could be useful, like that analogy that I gave you if you're to randomly draw a player salary out of all these possibilities, which what's the one you're most likely to draw? It's actually the 900,000. Here is a table and on the table our student responses to a test question. So we can see that there the A imagine is the multiple choice question A was chosen 22 times b is chosen 31 times and so on. Which letter response maybe I gave away the answer what is the mode response and the modal response is going to be d d is the modal response. The most common answer to this question was D. This completes our last module on measures of central tendency or middleness or looking at the averages and the next series of modules. We're going to look at a another descriptive statistic that try To be a single number that captures or explains a series of values, and that is called variability. So we looked at measures of middleness. Now we're going to look at measures of spread how different one value in a series is from the other values in a series.