**Transcript: Plots of Means in R Commander**

The last type of data visualization that we're going to go over in R Commander is one that combines categorical and numerical variables. So, for example, we know something about the distribution of spending on public education in U.S. states, but we might wonder if this varies by the region that the state is in. To do that, we could plot the mean of the public education spending within each region and be able to compare them visually.

To do this, we can go to “Graphs”, “Plot of means...”, and we will see this window. This “Factors” box has the categorical variable that we want to look at the means separately for. In this case, “region” is our only option. And in this case, the “Response Variable” is the numeric variable to be selected, so we could look at, say, teacher pay by region or percent of students who take the SAT by region, population, SAT scores, etc. But let's look at the “dollars” variable. First, let's just look a little bit at the “Options”. We've got some familiar stuff here, “x-axis label”, “y-axis label”, and “Graph title”. We also have some options for error bars. We may talk about those later in the term, but these are just essentially how you can indicate how precise your estimate is. We'll talk about that near the end of the term when we talk about confidence intervals, but it's a good thing to be aware of. We can change where the legend is and then this “Connect profiles of means” option. If it's selected, you'll have a line that's connecting the different dots. This is really good for categories that are ordered, but not so great for those that are unordered because the line doesn't really mean anything. So, we'll leave that unselected. Leave everything else as is and we'll select “OK”.

And we can see here our plot of means. Along the x-axis we have our different regions, and on the y-axis, we have the dollars spent on public education. We can see here right away that there is quite a bit of variability within the different regions of the United States in terms of how much they spend on public education. This MA, which is Mid-Atlantic, spends the most with an average of it looks like about $8000 per student per year, whereas ESC, which is East South Central, spends less than $4000 per student per year. We can start to think about reasons why this might be. You know, different levels of wealth, potentially different types of governments that would prioritize education spending more or less. That could be a really interesting question to look into further. But this plot does a really great job of showing us that there are differences and that we might want to look into why different states, sorry, different regions have different levels of education spending within them.