**Transcript: Reporting Independent Samples *t* tests in APA Style**

In this video, we're going to go over how to interpret the output of an independent samples *t* test from R Commander and SPSS. The first thing we can look at is our mean and standard deviation of our outcome variable, which in this case is “education”, within our two groups, which in this case are people who did or did not switch wells. Within our “no” group you can see that the heads of households had an average of 4.47 years of education with a standard deviation of 3.76. Within the “yes” group, heads of households had a mean of 5.09 years of education and a standard deviation of 4.18. You can see those same values in SPSS under “Group Statistics”—here we have the means and standard deviations. We can see descriptively that the households who switched wells did have heads of households who were more educated compared to households that did not switch wells.

In order to see whether this difference was statistically significant, though, we need to look at our *t* test results. The first thing we can look at within our *t* test results is our *t* statistic. In R Commander that's displayed here. We can see that *t* = -4.27. And within SPSS, it's displayed here. You'll see that SPSS gives us two different statistics, one for “Equal variance assumed” and one for “Equal variance is not assumed”. If you remember in the R Commander video, we selected an option to not assume equal variance. While the specifics of this are beyond the scope of this course, essentially what this means is that we're not assuming that there is equal variability or variance within the two groups—in this case, households that switched wells and households that did not switch wells. It's always better to assume that variances are not equal just because doing so adds an extra layer of requirement that they are equal, and this might not always be the case. So, we're going to look within this second row here, at the *t* statistic, where equal variances are not assumed.

The next thing we will look at is our *p* value, or sorry, our degrees of freedom. Our degrees of freedom are 2901.7 which is displayed here in SPSS again on the 2nd row, and here in R Commander. You might be wondering why our degrees of freedom is not a whole number, whereas in other analysis we've done, it has been a whole number. This is because we did not assume equal variance. Again, this is not something that you're required to understand the specifics of, but in case you're curious, it's just something that the statistical program does to compensate for the fact that variances are not equal between groups. Generally, you can report the degrees of freedom to the nearest whole number, which would be 2902 in this case. But you can also report it more precisely if you want.

Next, we will look at the *p* value, which in R Commander is displayed as .0000099. Within SPSS, if we scroll to the right, we will see that we have two columns for *p* values, “One-Sided” and “Two-Sided”, just like in our one-sample *t* test. Which column we look at depends on whether our hypothesis was one-sided or two-sided. In this case, we had a one-sided hypothesis—specifically, that households that switched wells would have heads of households with higher levels of education. We'll look at the one-sided *p*. In SPSS this is reported as <.001.

What we can conclude from this output is that our hypothesis was supported. We have enough evidence to reject the null hypothesis, which was that households that switched wells had heads of households with equal or lower levels of education compared to households that did not switch wells. In the next video, sorry, in the next section of the lab you will learn how to report the results of this independent samples *t* test in APA format.