

(Continued)

## Use this presentation to answer the following questions:

1. What were the means being statistically examined?

A: For T1, 14.33; for T2, 18.65, for T3, 17.56

2. What was the  $F$  ratio test statistic?

A: 129.825

3. How many degrees of freedom did the researchers have for this analysis?

A: 2 between (or numerator)  $dfs$  and 186 error (or denominator)  $dfs$

4. By using Appendix C, approximate the critical value that was used to see whether we reject or do not reject the null hypothesis.

A: We do not have a critical value of  $df_{\text{error}}$  of 186, so let's use  $df_{\text{error}}$  of 120, the next available critical value, which will be more conservative than  $df_{\text{error}}$  of 186. With  $df_{\text{between}}$  of 2, and assuming our usual alpha level of .05, that gives us a critical value of 3.07.

5. What is the probability that the differences among the three group means were due to random variation?

Less than .1% ( $p < .001$ )

6. Did the researchers reject or fail to reject the null hypothesis?

A: Because the  $p$  value was less than .05, we reject the null hypothesis because there is only an acceptably small chance that the differences among our means were due to random variation.

7. What is the effect size? Interpret what it means.

A: 0.414. This means that 41.4% of the variability in the dependent variable of knowledge about smoking was explained by the independent variable of point in time.

8. Explain these results in plain English to someone who knows nothing about ANOVAs or post hoc tests.

A: 7th graders had more knowledge about smoking after completing the program than before being part of the program. However, a year after the program was over, they had less knowledge about smoking than immediately after the program ended. Fortunately, these students still knew more about smoking a year after the program ended than they did before being part of the program. Thus, it does appear this program had a long-term impact on 7th graders knowledge about smoking.