**Chapter 11: One-Way Independent Samples ANOVA**

1. An independent samples ANOVA allows researchers to \_\_\_\_\_\_\_\_\_\_.

A. compare one sample mean to a population mean

B. compare sample means for two related groups

\*C. compare samples means for two or more unrelated groups

D. determine whether two independent variables interact to affect the dependent variable.

Learning Objective: 11-1: Identify when to use an independent samples ANOVA.

Cognitive Domain: Knowledge

Answer Location: Independent Samples ANOVA

2. One conceptual description of the independent samples ANOVA *F* ratio is that it compares the variability between conditions to the variability within the treatment conditions.

\*True

False

Learning Objective: 11-2: Explain the logic of the ANOVA *F* ratio.

Cognitive Domain: Knowledge

Answer Location: Logic of the ANOVA

3. In the Independent Samples ANOVA, treatment effects affect the \_\_\_\_\_\_\_\_\_\_\_.

A. denominator only

B. denominator and numerator

\*C. numerator only

Learning Objective: 11-3: Explain how measurement error, individual differences, and treatment effects influence the numerator and the denominator of the *F* ratio.

Cognitive Domain: Comprehension

Answer Location: Logic of the ANOVA

4. In the Independent Samples ANOVA, measurement error affects the \_\_\_\_\_\_\_\_\_\_\_.

A. denominator only

\*B. denominator and numerator

C. numerator only

Learning Objective: Explain how measurement error, individual differences, and treatment effects influence the numerator and the denominator of the *F* ratio

Cognitive Domain: Comprehension

Answer Location: Logic of the ANOVA

5. Fifteen people are randomly assigned, so that 5 people exercise in the morning, afternoon, or night. After 8 weeks, their weight loss is measured in pounds. State the null hypothesis for this study.

A. H0: µ1 ≠ µ2 = µ3

B. H0: µ1 = µ2 ≠ µ3

C. H0: µ1 ≠ µ2 ≠ µ3

\*D. H0: µ1 = µ2 = µ3

Learning Objective: 11-4: Write null and research hypotheses using symbols and words.

Cognitive Domain: Application

Answer Location: An Example ANOVA Problem

6. The research hypothesis is best stated as \_\_\_\_\_\_\_\_\_\_\_.

A. all populations means are different

\*B. at least one population mean is different from the others

Learning Objective: 11-4: Write null and research hypotheses using symbols and words.

Cognitive Domain: Application

Answer Location: An Example ANOVA Problem

7. For this study from question #5, compute the degrees of freedom for the Within treatments.

A. 14

\*B. 12

C. 3

D. 2

Learning Objective: 11-5: Complete an ANOVA summary table by computing the degrees of freedom, *SS*s, *MS*s, and *F* ratio.

Cognitive Domain: Application

Answer Location: An Example ANOVA Problem

8. For this study from question #5, compute the total degrees of freedom.

\*A. 14

B. 12

C. 3

D. 2

Learning Objective: 11-5: Complete an ANOVA summary table by computing the degrees of freedom, *SS*s, *MS*s, and *F* ratio.

Cognitive Domain: Application

Answer Location: An Example ANOVA Problem

9. For this study from question #5, compute the *MS*between.

A. 0.1339

B. 0.6694

\*C. 1.0045

D. 1.3010

Learning Objective: 11-5: Complete an ANOVA summary table by computing the degrees of freedom, *SS*s, *MS*s, and *F* ratio.

Cognitive Domain: Application

Answer Location: An Example ANOVA Problem

10. For this study from question #5, compute the *MS*within.

A. 0.1859

\*B. 0.2168

C. 0.3294

D. 0.5643

Learning Objective: 11-5: Complete an ANOVA summary table by computing the degrees of freedom, *SS*s, *MS*s, and *F* ratio.

Cognitive Domain: Application

Answer Location: An Example ANOVA Problem

11. For this study from question #5, compute the *F* ratio.

\*A. 4.633

B. 0.2177

C. 0.7721

D. 2.3055

Learning Objective: 11-5: Complete an ANOVA summary table by computing the degrees of freedom, *SS*s, *MS*s, and *F* ratio.

Cognitive Domain: Application

Answer Location: An Example ANOVA Problem

12. For this study from question #5, compute the overall effect size, *ηp*2.

A. 0.772

B. 0.564

\*C. 0.436

D. 0.218

Learning Objective: 11-7: Compute effect sizes and describe them.

Cognitive Domain: Application

Answer Location: An Example ANOVA Problem

13. For this study from question #5, identify the critical *F* value and whether or not you can reject the null hypothesis. Set α at .05.

\*A. The critical *F* value = 3.89, reject the null hypothesis.

B. The critical *F* value = 3.68, fail to reject the null hypothesis.

C. The critical *F* value = 3.49, reject the null hypothesis.

D. The critical *F* value = 3.11, fail to reject the null hypothesis.

Learning Objective: 11-6: Define a critical region and determine if you should reject or fail to reject the null hypothesis.

Cognitive Domain: Application

Answer Location: An Example ANOVA Problem

14. Based on the results of this study from question #5 with three groups, should you perform a post hoc test?

\*A. Yes, because you rejected the null hypothesis.

B. Yes, because you did not reject the null hypothesis.

C. No, because you rejected the null hypothesis.

D. No, because you did not reject the null hypothesis.

Learning Objective: 11-8: Explain when and why post hoc tests are necessary.

Cognitive Domain: Application

Answer Location: An Example ANOVA Problem