批阅: ESRM 64503: Homework 3

回应者

1	匿名	32:28 完成时间	20/20 分数

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2. Which of the following is the primary assumption of One-Way ANOVA?

- Equal medians across groups
- Homogeneity of variances ✓
- Independence of predictors
- Equal means across levels

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3. What does the F-test in One-Way ANOVA evaluate?

- Equality of all pairwise variances
- Difference in group sample sizes
- Ratio of within-group to between-group variance
- Ratio of between-group to within-group variance ✓

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4. In One-Way ANOVA, increasing within-group variance will most likely:

- Increase the F-value
- Decrease the F-value ✓
- Not affect the F-value
- Increase the effect size

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5. What is the null hypothesis in One-Way ANOVA?

- All group means are different
- At least one group differs in variance
- All group means are equal ✓
- Group variances are equal

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6. Which R function computes post-hoc pairwise comparisons?

- aov()
- t.test()
- TukeyHSD() ✓
- lm()

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7. If a One-Way ANOVA yields a significant result, what should you do next?

- Run a chi-square test
- Compute variance ratios
- Conduct post-hoc tests ✓
- Report effect sizes only

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8. Which of the following metrics best reflects effect size in One-Way ANOVA?

- ○ Cohen's d
- ◉ Eta squared (η^2) ✓
- ○ Z-score
- ○ R-squared from regression

Section 2: Two-Way ANOVA (Items 8–14)

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9. What distinguishes Two-Way ANOVA from One-Way ANOVA?

- ○ It uses non-parametric assumptions
- ○ It includes two dependent variables
- ◉ It includes two independent variables ✓
- ○ It is designed for repeated measures

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10. An interaction effect implies:

- The main effects are not significant
- The effect of one factor depends on the level of another ✓
- The two factors are independent
- No assumptions are required

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11. In R, what does the "*" operator do in the ANOVA model formula?

    For example: aov(score ~ A * B, data = your_data)

- Tests only main effects
- Excludes interactions
- Includes main effects and their interaction ✓
- Divides the sample into clusters

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12. How would you test **only the main effects** but **not** the interaction?

- score ~ A * B
- score ~ A:B
- score ~ A + B ✓
- score ~ A/B

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13. The degrees of freedom for the interaction term in a 3 × 2 design is:

- 6
- 2 ✓
- 3
- 5

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14. In Two-Way ANOVA, a significant main effect with a non-significant interaction suggests:

- Interaction cancels out main effects
- Main effects are not interpretable
- Main effects are consistent across levels of the other factor ✓
- The model has bad model fitting

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15. In a Two-Way ANOVA, which statement best describes how to interpret a significant interaction term?

- The effect of each factor is constant across all levels of the other factor.
- The main effects can be interpreted independently.
- The effect of one factor changes depending on the level of the other factor. ✓
- The factors are uncorrelated and additive.

Section 3: Repeated Measures ANOVA (Items 15–20)

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16. What is a key assumption unique to repeated measures ANOVA?

- Homogeneity of variance
- Multicollinearity
- Sphericity ✓
- Independence of groups

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17. A violation of sphericity is most likely to lead to:

- Inflated Type I error ✓
- More accurate p-values
- Lower effect sizes
- Non-significance of F-statistics

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18. Which of the following is a key reason to prefer a repeated measures ANOVA over a between-subjects ANOVA when appropriate?

- It ensures equal sample sizes across all conditions.
- It eliminates the need for post-hoc tests.
- It accounts for the correlation between repeated observations within subjects. ✓
- It does not require any distributional assumptions.

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19. In repeated measures ANOVA, each subject contributes data:

- For a single time point
- Across all time points ✓
- Only for baseline
- Only for final assessment

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20. In repeated measures ANOVA, why is the subject factor included as a random effect?

- (●) To model individual differences and account for the dependency of repeated observations. ✓
- ( ) To test whether subjects differ significantly across time.
- ( ) To eliminate the need for post-hoc comparisons.
- ( ) To correct for violations of normality.

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21. What is the primary advantage of modeling within-subject variability in repeated measures ANOVA?

- ( ) It reduces the number of groups required for analysis.
- ( ) It allows for more liberal significance thresholds.
- (●) It increases statistical power by controlling for individual differences. ✓
- ( ) It ensures homogeneity of variance across time points.