**Psychology 492 Laboratory Homework #5b Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Walk Though** data set **🡪 examprep\_kxkMG\_2011.sav**

The purpose of the study was to look for differential performance over time by those who completed individual vs. group Exam preparation assignments. Data were obtained from two successive semesters of a History of Psychology course. The course included three exams, each of which was preceded by a preparatory assignment designed to review the key issues covered during that portion of the course. During the Fall semester each of these assignments was completed individually by each student. During the Spring semester each of these assignments was completed in groups of three students. The outcome variables were the % scores from each of the three exams.

**Research hypotheses:**

RH1: Group preparation will lead to higher scores than will Individual Preparation.

RH2: Exams grades will improve the same across the semester

There was some disagreement about how to characterize the interaction hypothesis, so …

RH3: Group Preparation will lead to higher scores than Individual Preparation at Exam 1, and the benefit of Group Preparation will increase during subsequent Exams.

RH4: For those completing Individual Preparation, Exam scores will be stable across the semester, whereas those completing Group preparation will show increasing performance across Exams.

Getting Started

Show the cell and marginal means in the table below. Be sure to use the estimated marginal means from the EMMEANS results, not the sample means from the Descriptives table – remember, we are trying to represent the effects/model, not the sample.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | E1 | E2 | E3 | Total |
| Individual |  |  |  |  |
| Group |  |  |  |  |
| Total |  |  |  |  |

Insert the plot of the model below.

Interaction F = \_\_\_\_\_\_\_\_\_\_ df = \_\_\_\_, \_\_\_\_\_\_ MSe = \_\_\_\_\_\_\_\_\_\_ p = \_\_\_\_\_\_\_\_\_

n = k = dferror = MSerror = LSDmmd =

Is this effect causally interpretable?

Why or why not?

Could you conduct this study so that the interaction was causally interpretable?

Carefully explain your answer.

Use <, > & = to indicate the RH: and the results based on the EMMEANS pairwise comparisons. Also indicate whether or not the RH: is supported for each.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Prep Type 🡪 | | Individual | | | | |  | Group | | | |
| Exam🡪 | | E1 vs. E2 | | E1 vs. E3 | E2 vs. E3. |  | E1 vs. E2 | | | E1 vs. E3 | E2 vs. E3. |
| RH: | |  | |  |  |  |  | | |  |  |
| EMMEANS results | |  | |  |  |  |  | | |  |  |
| r | |  | |  |  |  |  | | |  |  |
| Support RH: ? | |  | |  |  |  |  | | |  |  |

Describe the pattern of this interaction, based on this set of simple effects.

Copy below the portion of the research hypotheses tested by this set of simple effects.

.

Do the results support this portion of the research hypotheses?

Carefully explain your answer!

Simple Effect of Preparation Type for each Exam: Use <, > & = to indicate the results based on EMMEANS for each pairwise comparison. Also compute the effect size.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Exam🡪 | | E1 | | |  | E2 | | |  | E3 | |
| Prep Type🡪 | | Ind vs. Grp | |  | Ind vs. Grp | | |  | Ind vs. Grp | | |
| RH: | |  | |  |  | | |  |  | | |
| EMMEANS results | |  | |  |  | | |  |  | | |
| r | |  | |  |  | | |  |  | | |
| Support RH: | |  | |  |  | | |  |  | | |

Describe the pattern of this interaction, based on this set of simple effects.

Copy below the portion of the research hypotheses tested by this set of simple effects.

.

Do the results support this portion of the research hypotheses?

Carefully explain your answer!

For the Exam main effect F = \_\_\_\_\_\_\_\_\_\_ df = \_\_, \_\_\_\_ MSe = \_\_\_\_\_\_\_\_ p = \_\_\_\_\_\_\_\_\_

n = k = dferror = MSerror = LSDmmd =

Is this effect causally interpretable?

Why or why not?

Could you conduct this study so that the interaction was causally interpretable?

Carefully explain your answer.

Main Effect of Exam: Use <, > & = to indicate the results based on EMMEANS for each pairwise comparison. Also compute the effect size.

|  |  |  |  |
| --- | --- | --- | --- |
|  | E1 vs. E2 | E1 vs. E3 | E2 vs. E3. |
| RH: |  |  |  |
| EMMEANS results |  |  |  |
| r |  |  |  |
| Support RH: ? |  |  |  |

Describe the pattern of this main effect.

How will you determine if the pattern of this main effect is descriptive or misleading?

Is the pattern of the main effect descriptive or misleading?

.

Copy below the portion of the research hypotheses tested by this set of simple effects.

Do the results support this portion of the research hypotheses?

Carefully explain your answer!

Remember: “For a main effect RH: to be fully supported, that main effect must be descriptive.”

For the Preparation Type main effect F = \_\_\_\_\_\_\_\_\_\_ df = \_\_\_, \_\_\_\_ MSe = \_\_\_\_\_\_\_\_\_\_ p = \_\_\_\_\_\_

Is this effect causally interpretable?

Why or why not?

Could you conduct this study so that the interaction was causally interpretable?

Carefully explain your answer.

Use <, > & = to indicate the RH: and the results based on the EMMEANS pairwise comparisons. Also indicate whether or not the RH: is supported for each.

|  |  |
| --- | --- |
| Prep Type comparison 🡪 | Ind vs. Grp |
| RH: |  |
| Pairwiseresults |  |
| Support RH: ? |  |

Describe the pattern of this main effect.

How will you determine if the pattern of this main effect is descriptive or misleading?

.

Is the pattern of the main effect descriptive or misleading?

Copy below the portion of the research hypotheses tested by this set of simple effects.

Do the results support this portion of the research hypotheses? No Carefully explain your answer!

Remember: “For a main effect RH: to be fully supported, that main effect must be descriptive.”

**On Your Own: 2xk MG ANOVA** data set **🡪 clinical\_kxkMG\_2009.sav**

Stress affects different “kinds” of people differently! This study looked at how the “normal” stressors of the scholastic semester differently affected “traditional” and “older” students.

The hypothesis was that while there would be no difference between these groups at the beginning of the semester, “older” students would show greater increases in stress during the semester, than would “traditional” students, resulting in much higher stress levels among “older” students during the end of the semester.

RH#1: There would be no difference between these groups at the beginning of the semester, but at the end of the semester older students have much higher stress levels compared to traditional students.

RH#2: Older students would show greater increases in stress during the semester compared to traditional students. 🡨

RH#3: Stress increases during the semester.

RH#4: Older students will have high stress compared to traditional students.

Portray that hypothesis below.

“Traditional”

“Older”

Stress

Beginning 5 weeks 10 weeks 15 weeks

Does your portrayal predict an interaction?

Does your portrayal predict a main effect for Semester? Is that main effect expected to be descriptive or misleading? Please explain your answer carefully.

Does your portrayal predict a main effect for Group? Is that main effect expected to be descriptive or misleading? Please explain your answer carefully.

Show the cell and marginal means in the table below. Be sure to use the estimated marginal means from the EMMEANS results, not the sample means from the Descriptives table – remember, we are trying to represent the effects/model, not the sample.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | 0 Weeks | 5 Weeks | 10 Weeks | 15 Weeks | Total |
| Traditional |  |  |  |  |  |
| Older |  |  |  |  |  |
| Total |  |  |  |  |  |

Insert the plot of the model below.

Interaction: F = df = MSe = p =

N = n = k = dferror = MSerror = LSDmmd =

Is the interaction effect causally interpretable?

Why or why not?

Could you conduct this study so that the interaction was causally interpretable?

Carefully explain your answer.

Use <, > & = to indicate the RH: and the results based on the EMMEANS pairwise comparisons. Also indicate whether or not the RH: is supported for each.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Traditional Students | | | | | | |
| Semester pairwise comparisons 🡺 | 0 vs. 5  weeks | 0 vs. 10 weeks | 0 vs. 15 weeks | 5 vs. 10 weeks | 5 vs. 15 weeks | 10 vs. 15 weeks |
| RH: |  |  |  |  |  |  |
| pairwiseresults |  |  |  |  |  |  |
| Support RH: ? |  |  |  |  |  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Older Students | | | | | | |
| Semester pairwise comparisons 🡺 | 0 vs. 5  weeks | 0 vs. 10 weeks | 0 vs. 15 weeks | 5 vs. 10 weeks | 5 vs. 15 weeks | 10 vs. 15 weeks |
| RH: |  |  |  |  |  |  |
| pairwiseresults |  |  |  |  |  |  |
| Support RH: ? |  |  |  |  |  |  |

Describe the pattern of this interaction, based on this set of simple effects.

The research hypothesis actually gives **both** sets of simple effects.

What parts of the research hypothesis relate to the simple effects of group at each time?

What parts of the research hypothesis relate to the simple effects of time for each group?

Which of these is directly tested by EMMEANS analyses just above?

Do these results support the RH:? Why or why not?

Copy below the portion of the research hypotheses tested by this set of simple effects.

Do the results support this portion of the research hypotheses? Partial Carefully explain your answer!

Use <, > & = to indicate the RH: and the results based on the EMMEANS pairwise comparisons. Also indicate whether or not the RH: is supported for each.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 0 weeks | |  | 5 weeks | |  | 10 weeks | |  | 15 weeks | |
|  | Trad vs Older |  | Trad vs Older | |  | Trad vs Older | |  | Trad vs Older | |
| RH: |  |  |  | |  |  | |  |  | |
| Pairwise results |  |  |  | |  |  | |  |  | |
| Support RH: ? |  |  |  | |  |  | |  |  | |

Describe the pattern of this interaction, based on this set of simple effects.

Copy below the portion of the research hypotheses tested by this set of simple effects.

Do the results support this portion of the research hypotheses? Partially Carefully explain your answer!

.

**Main effect of Semester** F = \_\_\_\_\_\_\_ df = \_\_\_\_, \_\_\_\_\_\_\_ MSe = \_\_\_\_\_\_\_\_ p = \_\_\_\_\_\_\_\_

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Semester pairwise comparisons 🡺 | 0 vs. 5  weeks | 0 vs. 10 weeks | 0 vs. 15 weeks | 5 vs. 10 weeks | 5 vs. 15 weeks | 10 vs. 15 weeks |
| Marginal means |  |  |  |  |  |  |

Is the main effect of Semester causally interpretable? \_\_\_\_\_\_\_\_\_\_ Why or why not?

Could you conduct this study so that the interaction was causally interpretable? Carefully explain your answer.

Since Semester has more than 2 conditions, if the main effect is significant, we will need to do EMMEANS to compare the pattern of the marginal means.

Use <, > & = to indicate the RH: and the results based on the EMMEANS pairwise comparisons. Also indicate whether or not the RH: is supported for each.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Semester pairwise comparisons 🡺 | 0 vs. 5  weeks | 0 vs. 10 weeks | 0 vs. 15 weeks | 5 vs. 10 weeks | 5 vs. 15 weeks | 10 vs. 15 weeks |
| RH: |  |  |  |  |  |  |
| pairwiseresults |  |  |  |  |  |  |
| Support RH: ? |  |  |  |  |  |  |

Describe the pattern of the main effect of Semester.

How will you determine if the pattern of this main effect is descriptive or misleading?

Is the pattern of the main effect descriptive or misleading?

Copy below the portion of the research hypotheses tested by this set of simple effects.

Do the results support this portion of the research hypotheses?

Carefully explain your answer!

Remember: “For a main effect RH: to be fully supported, that main effect must be descriptive.”

Which part of the research hypothesis is tested with this main effect?

Does this pattern support that part of the research hypothesis?

Why or why not?

**Main effect of Group**  F = \_\_\_\_\_\_\_ df = \_\_\_\_, \_\_\_\_\_\_\_ MSe = \_\_\_\_\_\_\_\_ p = \_\_\_\_\_\_\_\_

|  |  |
| --- | --- |
| Group pairwise comparisons 🡺 | “Traditional” vs. “Older” |
| Marginal means |  |

Is the main effect of Group causally interpretable? \_\_\_\_\_\_\_\_\_ Why or why not?

Could you conduct this study so that the interaction was causally interpretable? Carefully explain your answer.

Use <, > & = to indicate the RH: and the results based on the EMMEANS pairwise comparisons. Also indicate whether or not the RH: is supported for each.

|  |  |
| --- | --- |
| Group pairwise comparisons 🡺 | Traditional vs. Older |
| RH: |  |
| pairwiseresults |  |
| Support RH: ? |  |

To determine if the pattern of the Group main effect is descriptive or misleading, we will need to look at the simple effect of Group for each portion of the Semester.

|  |  |
| --- | --- |
| Social support pairwise comparisons 🡺 | “Traditional” vs. “Older” |
| 0 weeks |  |
| 5 weeks |  |
| 10 weeks |  |
| 15 weeks |  |

Describe the pattern of this main effect.

How will you determine if the pattern of this main effect is descriptive or misleading?

Is the pattern of the main effect descriptive or misleading?

Copy below the portion of the research hypotheses tested by this set of simple effects.

Do the results support this portion of the research hypotheses?

Carefully explain your answer!

Remember: “For a main effect RH: to be fully supported, that main effect must be descriptive.”