

Name: _____

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Assignment 11 Part I

1. 1) Dr. Alucard is interested in the auditory discrimination abilities of bats. First, he trains 21 bats to fly from a perch at one end of the experimental chamber to the food box at the other end of the room. He then constructs three different mazes of vertical wires (similar to the maze seen in the movie for the cats, but they go from floor to ceiling with a small opening to allow the bat to move through one wall of wire to the next) between the starting perch and the food box. In one maze the wires are Thick, in one maze the wires are Intermediate, and in the final maze the wires are Thin. Each maze is different (openings are in different locations). The dependent variable he decides to use is the number of times a bat hits the wires of the maze. Dr. Alucard decides to use a repeated measures design for this experiment. Why might he decide to do so? Give Dr. Alucard specific instructions as to how he should construct his experiment (how many bats he should use, how he should run each bat through the experiment, etc.).
- 2) Below are the means and a completed ANOVA source table for Dr. Alucard's experiment.

	Thin wire	Intermediate wire	Thick wire
Mean # of touches	5	1	0

source	SS	DF	MS	F
Treatments(wire width)	126	2	63	31.5
Subject	1	17		
Error	68	34	2	

Does it appear that Dr. Alucard realized any advantage from using a repeated measures design in this experiment? Why or why not?

2. A researcher was interested in investigating the relationship between the amount of time on task per day (no homework, ½ hour, 1 hour, 1 and ½ hours, and 2 hours) and phonological awareness of struggling readers in kindergarten. 8 kids participated in the experiment. The table below summarizes results. Answer the following questions.

Mauchly's Test of Sphericity^b

Measure: MEASURE_1

Within Subjects Effect	Mauchly's W	Approx. Chi-Square	df	Sig.	Epsilon ^a		
					Greenhouse-Geisser	Huynh-Feldt	Lower-bound

phonological	.702	7.8	5	.168	.805	1.000	.453
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Tests of Within-Subjects Effects

Measure: MEASURE_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
phonological	Sphericity Assumed	194.500	(1)	64.833	47.772	.000
	Greenhouse-Geisser	194.500	1.257	154.733	47.772	.000
	Huynh-Feldt	194.500	1.403	138.632	47.772	.000
	Lower-bound	194.500	1.000	194.500	47.772	.000
Error(phonological)	Sphericity Assumed	28.500	(2)	1.357		
	Greenhouse-Geisser	28.500	8.798	3.239		
	Huynh-Feldt	28.500	9.818	2.903		
	Lower-bound	28.500	7.000	4.071		

1. Complete the degree of freedoms for (1) and (2) in the table.
2. Is there any evidence to indicate that the assumption of sphericity has been violated? State an appropriate test statistic and a descriptive statistic.
3. Is there significant main effect of time on task on phonological awareness?
4. What is the effect size of time on task?

Part II: SPSS

For 16 consecutive days, a researcher chooses one random visitor at the zoo to follow around during their visit and records the number of minutes they each spend visiting 4 animals: monkey, meerkat, elephant and koala. He wants to use ANOVA to determine if there are differences in the average number of minutes a person spends visiting the different animals.

The data he recorded can be found in the file zoo.sav.

1. Before running a within-subjects design analysis of variance, you want to test for the assumption of sphericity. Why? (What is the result if this assumption is violated?)
2. Test the assumption of sphericity. Report the test statistic, related p-value, and your conclusion about whether or not the assumption of sphericity has been violated.
3. From your output, show which Mean Square values were used to calculate the F-statistic for number (3).
4. Using pairwise comparisons (Options->Display Means for Factor 1 -> Check "Compare Main Effects"-> select "Bonferonni adjustment"), describe for which animals there exists a statistically significant difference in the amount of time they are visited at the zoo.