

As always, the Skidmore Honor Code is in effect. At the end of the exam, I have a sheet on which you will attest to your adherence to the Honor Code. Read each question carefully and answer completely, showing all your work. Good Luck!

1. Although psychologists do not completely understand the phenomenon of dreaming, it does appear that people need to dream (or, at the very least, need REM sleep). One experiment demonstrating this fact shows that people who are deprived of REM sleep one night tend to have more REM sleep (dreams?) the following night, as if they were trying to make up for the lost REM sleep. In a typical version of this experiment, the psychologist first records the number of periods of REM sleep during a normal night's sleep. The next night, each participant is prevented from REM sleep by being awakened as soon as he or she begins to exhibit REM sleep. During the third night, the psychologist once again records the number of periods of REM sleep. Hypothetical data from this experiment are seen below. Analyze and interpret these results as completely as you can. [15 pts]

Participant	First Night	Night After Deprivation
1	4	7
2	5	5
3	4	8
4	6	7
5	4	9
6	5	7
7	4	7
8	4	6
Sum (T)	36	56
ΣX^2	166	402
SS	4	10

2a. Dr. Kip Werkin is an industrial/organizational psychologist who is interested in the impact of environmental factors (such as noise) on productivity. He has a group of ten workers experience each of a set of background noise levels (70 dB, 80 dB, 90 dB, and 100 dB SPL) as they work on a project that involves creating delicate instruments. (SPL = Sound Pressure Level) The dependent variable is the number of errors made in the construction of the pieces. Complete the source table and tell Dr. Werkin what he should conclude from this study. [10 pts]

ANOVA Table for SPL

	DF	Sum of Squares	Mean Square	F-Value	P-Value	Lambda	Power
Subject		4.0					
Category for SPL		13.9			<.0001	67.018	1.000
Category for SPL * Subject		5.6					

Means Table for SPL

Effect: Category for SPL

	Count	Mean	Std. Dev.	Std. Err.
SPL 70 dB	10	.200	.422	.133
SPL 80 dB	10	.200	.422	.133
SPL 90 dB	10	1.000	.667	.211
SPL 100 dB	10	1.600	.516	.163

2b. If the *same* data were analyzed with an independent groups ANOVA, complete the source table below. [5 pts]

Source	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>
Treatment				
Error				
Total				

3a. Before making a decision about his advertising campaign, a publisher ran an experiment to discover whether readers' responses to certain ads differed. He wanted to test responses to three kinds of ads: ads with a color picture, ads with a black-and-white picture, and ads with no picture. Each ad was inserted with other material intended to draw attention away from the material being evaluated. Participants rated the critical ad on an 11-point scale (1 = little preference for the ad, 11 = great preference for the ad). Results for the 24 participants are given below. Analyze the results as completely as you can and then interpret the results. [20 pts]

	Color Picture	Black-and-White Picture	No Picture
	3	4	10
	3	7	7
	7	5	8
	6	3	5
	8	9	9
	1	8	7
	5	7	6
	3	5	8
Sum (T)	36	48	60
ΣX^2	202	318	468
SS	40	30	18

3b. [No computation is necessary to answer this part of the question.] Suppose that the *same 24 pieces of data* had been obtained from only 8 participants (in 3a) in a repeated measures analysis. How would your interpretation of the results be most likely to differ? Under which conditions would the F -ratio for Type of Ad be larger as a result of the new analysis? Under which conditions would the F -ratio be smaller as a result of the new analysis? [Examples, such as a possible source table, are not essential but might help here.] [5 pts]