

Once again, keep the Skidmore Honor Code in mind as you complete your exam. You should answer each question as completely as you can. For each question, be alert to any methodological flaws that might be present. Because I think of a point as a minute, you should also be careful to put in the appropriate amount of time in responding to each question. Good luck on the exam. Have a safe trip home and a relaxing break. Happy Thanksgiving. (And know that I'm thankful for the seriousness with which so many of you have approached this course!)

1. Suppose that you are interested in learning which factors lead to better performance on exams. Thus, you decide to use test performance (% correct) as your dependent variable. You will have a group of participants study in preparation for a test in an obscure area of knowledge for the typical person (that is, a topic about which people are unlikely to know a lot of information). [Why would you want an obscure content area for your experiment?] You decide that you want to use two independent variables: number of hours spent studying and the extent to which the material being learned is inherently interesting. Prior to beginning the study, you have an independent group of students rate the extent to which 10 topics are interesting. From the 10 topics, you choose 3 to use in your study (the topic rated least interesting, the topic rated most interesting, and a topic rated in the middle in terms of interest). Thus, the *Interest* factor has 3 levels, which I would like you to treat as a repeated measures factor. The number of hours spent studying that you assess is up to you, except that the factor must contain at least 3 levels and it must be an independent groups (between groups) factor. Therefore, the experiment you are about to design is at least a 3x3 mixed design (though it could have more than 3 levels of the *Hours Studying* factor if you so choose). Think carefully. What I want you to do is to lay out for me in fairly explicit detail how you would design/conduct this experiment. Be sure to address all the issues that we have discussed that would be important in designing experiments of this sort. I want you to provide sufficient detail so that I can tell that you've thought through the experiment in concrete terms. Be explicit!! [25 pts]

2. Most adolescents experience a growth spurt when they are between 12 and 15 years old. A psychologist studying the physical development of adolescents recorded the gain in height (in centimeters) over a 1-year period for boys and girls ranging in age from 11 to 15. Thus, the *Age* factor has 5 levels. The other factor of interest is *Gender*. The partially completed source table for this 2x5 design is seen below. Complete the source table and then interpret the study as completely as you can. [20 pts]

**ANOVA Table for Growth**

	DF	Sum of Squares	Mean Square	F-Value	P-Value	Lambda	Power
Age	4		9.517		<.0001	40.641	1.000
Gender	1		18.150		<.0001	19.377	.996
Age * Gender	4		47.983		<.0001	204.911	1.000
Residual	50		.937				

**Means Table for Growth**

Effect: Age \* Gender

	Count	Mean	Std. Dev.	Std. Err.
11, Female	6	5.833	.753	.307
11, Male	6	4.833	.753	.307
12, Female	6	8.500	1.049	.428
12, Male	6	4.833	.983	.401
13, Female	6	6.167	.753	.307
13, Male	6	5.833	1.169	.477
14, Female	6	3.667	.816	.333
14, Male	6	8.500	1.378	.563
15, Female	6	1.500	.548	.224
15, Male	6	7.167	1.169	.477

3. A researcher interested in group dynamics hypothesizes that when groups of people are given a problem to solve, they will reach a unanimous consensus more quickly if the group is composed of members of the same gender than if the group is composed of people of both genders. She proposes the following independent groups design (3 levels): a group of 6 males, a group of 6 females, or a group of 6 males and 6 females will meet in a conference room. (Thus, there are three different types of groups defined by gender composition.) The researcher will give the participants biographies of three people who are being considered for an advisory position in a shipping company. The group's task is to select one of the applicants for the position through discussion and deliberation. The experimenter will be present to act as a moderator, but she will not attempt to sway the decision in one way or another. The amount of time needed to reach a decision will be the dependent variable. Are there any problems with this procedure? [10 pts]

4. The Yerkes-Dodson Law asserts that performance is lower with low and high arousal levels and higher with medium levels of arousal (an inverted-U-shaped function). Dr. Lance Boyle decides to conduct a 2x5 independent groups design with two levels of reward (\$1 for each correct answer and \$5 for each correct answer) and five levels of arousal (Very Low, Low, Moderate, High, and Very High). (Levels of arousal were determined by amount of caffeine ingested.) The dependent variable is number of problems correctly solved in a 10-minute period. Complete the source table below and interpret the results of this study as completely as you can. [15 pts]

**ANOVA Table for Problems Solved**

	DF	Sum of Squares	Mean Square	F-Value	P-Value	Lambda	Power
Reward		216.090			<.0001	134.775	1.000
Arousal		510.560			<.0001	318.437	1.000
Reward * Arousal		.360			.9940	.225	.061
Residual		144.300					

Means Table for Problems Solved

Effect: Reward \* Arousal

	Count	Mean	Std. Dev.	Std. Err.
\$1, High	10	4.100	1.370	.433
\$1, Low	10	4.100	1.197	.379
\$1, Moderate	10	9.000	1.247	.394
\$1, Very High	10	3.000	1.247	.394
\$1, Very Low	10	3.100	1.197	.379
\$5, High	10	6.900	1.197	.379
\$5, Low	10	7.100	1.197	.379
\$5, Moderate	10	12.100	1.370	.433
\$5, Very High	10	6.000	1.247	.394
\$5, Very Low	10	5.900	1.370	.433