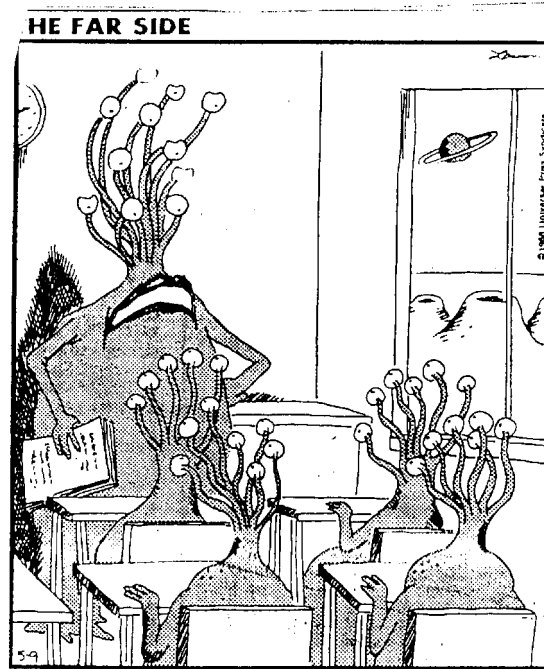


Okay, here it is! Read each question carefully and answer completely. You should think of the point value of each question as indicating the approximate amount of time that I think it should take you to answer that question (i.e., 10 pts = 10 minutes). If you're spending 30 minutes on a question worth 5 pts you're making a tactical error. Read over the entire exam quickly first to see if you might prefer to start on some question other than the one on this page. You don't need to use prose and complete sentences to answer the questions — outlines and phrases might be sufficient, but be sure to be complete in your answers. The Skidmore Honor Code is certainly in effect for this exam, so adhere to it carefully (see below). Good Luck!!



"And one final warning before we begin the exam — any stray eyeballs will be immediately thumped."

1. What is meant by a non-manipulated characteristic of a participant? (Providing an example would help.) Then, tell me why such a variable would make causal claims difficult to make? [5 pts]

2. Professor Isabel C. Ewe has taught for several years and, based on her experience, believes that students who tend to sit toward the front of the classroom perform better on exams than students who tend to sit toward the back of the classroom. To test her hypothesis, she collects data from several of her classes, recording the student's final grade (A=4, B=3, etc.) and the typical row in which the student sat throughout the term (Row 1 = Front and Row 8 = Back). Thus, she conceives of her study as a single-factor independent groups design with two levels of the IV (Front and Back). She decides to analyze her data on StatView using ANOVA. Her output is shown below. Interpret the results of her study as completely as you can. [5 pts]

**ANOVA Table for GPA**

	DF	Sum of Squares	Mean Square	F-Value	P-Value	Lambda	Power
Seat	1	1.225	1.225	13.667	.0007	13.667	.965
Residual	38	3.406	.090				

**Means Table for GPA**

Effect: Seat

	Count	Mean	Std. Dev.	Std. Err.
Back	20	3.090	.318	.071
Front	20	3.440	.280	.063

3. Suppose that you are interested in determining if Motivation causes changes in performance on a problem-solving task. Your IV would be the level of motivation, with three levels: Low Motivation, Medium Motivation, and High Motivation. You decide to use the type of reward to produce the levels of motivation (\$.10 for each correct response in the Low Motivation group, \$.75 for each correct response in the Medium Motivation group, and \$1.00 for each correct response in the High Motivation group). You decide to use the number of problems solved within 30 minutes as your DV. Because of power considerations, you figure that you need at least 30 pieces of data for each condition. [20 pts]

- a. Tell me what sort of design you would use and why.
- b. How many participants would you need?
- c. Briefly, but explicitly, describe how you would conduct your study. (It may help to describe how you would run each participant.)

4. Dr. Richard Noggin is interested in the effect of different types of persuasive messages on a person's willingness to engage in socially conscious behaviors. To that end, he asks his participants to listen to each of four different types of messages (Fear Invoking, Appeal to Conscience, Guilt, and Information Laden). After listening to each message, the participant rates how effective the message was on a scale of 1-7 (1 = very ineffective and 7 = very effective). Complete the source table and analyze the data as completely as you can. [20 pts]

**ANOVA Table for Message**

	DF	Sum of Squares	Mean Square	F-Value	P-Value	Lambda	Power
Subject		27.000					
Category for Message		65.845		32.194	<.0001	96.583	1.000
Category for Message * Subject		40.905					

**Means Table for Message**

**Effect: Category for Message**

	Count	Mean	Std. Dev.	Std. Err.
Fear	21	2.333	.796	.174
Conscience	21	3.000	1.000	.218
Guilt	21	4.714	1.102	.240
Information	21	2.952	.740	.161

5. First of all, define external validity and contrast it with internal validity (be very clear!!). What would you describe as the major point that Mook was making in his article on external invalidity? Mook argues that external validity may not be all that important when we are considering:

- a. whether something *can* happen, rather than whether it typically *does* happen;
- b. a prediction that something should happen in the lab, based on a theory;
- c. showing that a phenomenon is so powerful that it can happen even under unnatural conditions.

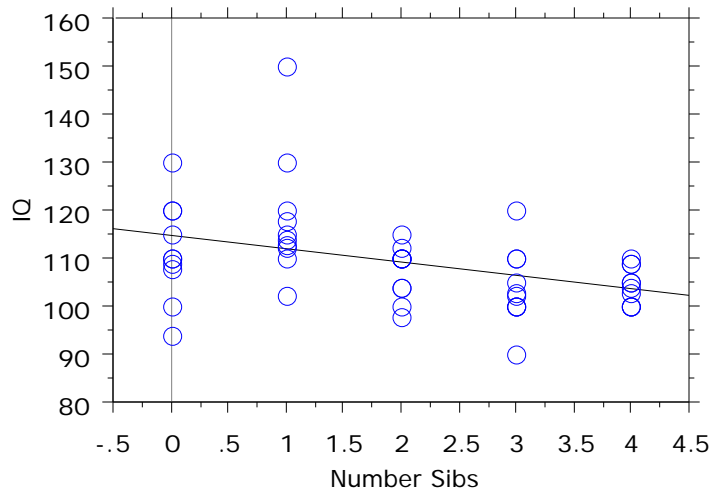
Using specific studies as examples, briefly describe the evidence from the article that illustrates *two* of the above conditions under which external invalidity may not be all that problematic. [10 pts]

6. Dr. Susan Mee is interested in the relationship between IQ and Number of Siblings. She is convinced that a "dilution of intelligence" takes place as siblings join a family (person with no siblings grew up interacting with two adult parents, person with one sibling grew up interacting with two adults+youngster, etc.), leading to a decrease in the IQ levels of children from increasingly larger families. She collects data from fifty 10-year-olds who have 0, 1, 2, 3, or 4 siblings and analyzes her data with StatView, producing the output seen below. Interpret the output as completely as you can and tell Dr. Mee what she can reasonably conclude, given her original hypothesis. What proportion of the variability in IQ is shared with Number of Siblings? If a person had 3 siblings, what would be your best prediction of that person's IQ? What about 5 siblings? On the basis of this study, would you encourage Dr. Mee to argue in print that Number of Siblings has a causal impact on IQ? Why or why not? [10 pts]

**Regression Summary**  
IQ vs. Number Sibs

Count	50
Num. Missing	0
R	.406
R Squared	.165
Adjusted R Squared	.148
RMS Residual	9.281

**Regression Plot**



**ANOVA Table**

IQ vs. Number Sibs

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	817.960	817.960	9.496	.0034
Residual	48	4134.760	86.141		
Total	49	4952.720			

**Regression Coefficients**

IQ vs. Number Sibs

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	114.880	2.273	114.880	50.532	<.0001
Number Sibs	-2.860	.928	-.406	-3.081	.0034