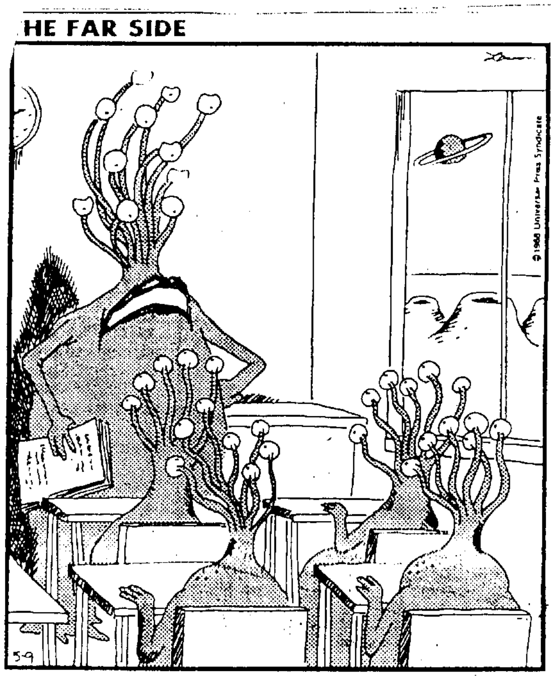
ID# ____________________ Exam 1 PS306, Fall 1998



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

OK, the Skidmore Honor Code is in force (as always). Keep your eyes focused on your own exam. You should read each question carefully and answer each question completely. Think! Don't hesitate to comment on some aspect of a study that is not queried directly. Each question has associated with it a certain point value. I tend to think of points as minutes, so the entire exam is worth 70 points (thus, I think you should be able to complete the exam in 70 minutes). Don't spend 30 minutes on a 10-point question, or you won't finish the exam. On the other hand, if you've answered a 20 point question in 5 minutes, you've likely missed something. Good Luck! Have a nice weekend!

1. Define what we mean by the term *operational definition* and then cite a specific example of an operational definition from a study discussed in the Mook article. [5 pts]

2. Define both internal and external validity. Which type of validity is more important? Why? Using the Higgins and Marlatt study (drinking alcohol as a means of reducing tension) *and* the Argyle study (glasses and intelligence), tell me what Mook has to say about the importance of external validity. [15 pts]

3. Hess has done work that suggests that pupil size is affected by emotional arousal. In order to ascertain if the type of arousal makes a difference, Dr. Bo Ring decides to measure pupil size under three different arousal conditions (Neutral, Pleasant, Aversive). Participants look at pictures that differ according to the condition (neutral = plain brick building, pleasant = young man and woman sharing an ice cream cone, aversive = graphic photograph of an automobile accident). The pupil size after viewing each photograph is measured in millimeters. The data are seen below:

Neutral	Pleasant	Aversive
4	8	3
3	7	7
2	7	3
3	8	4
3	6	7
5	7	4
4	8	4
3	7	6
5	6	5
2	7	6

a. Due to miscommunication between Dr. Ring and her research assistant Igor, she has no idea if the study was run as an independent groups design or as a repeated measures design. Igor has left the lab in a cloud of controversy amidst a whole range of allegations (involving improper use of lab alcohol, monkeys, and videotapes), but that's another story entirely. With no immediate hope of clarifying the way in which the data were collected, Dr. Ring decides that the most reasonable strategy would be to analyze the data as an independent groups design. Her logic should make sense to you, so explain to me why she would be smart to analyze the data as though they were collected in an independent groups design. [5 pts]

b. OK, Dr. Ring analyzes the data using StatView, but she's a notorious slob and has dropped donut filling over portions of the source table. But she's not just a slob, she's a frugal slob. You've just been hired to replace her research assistant (so stay away from the alcohol, monkeys, etc.). She knows how sophisticated you are, so she wants you to figure out the ANOVA source table without running the data through the computer again. Of course, you can easily do so with the information remaining in the source table, so do so now. Then, to truly ingratiate yourself to your new employer, analyze the data as completely as you can. Impress the hell out of her! [20 pts]

Analysis of Variance Table

Source:	DF:	Sum Squares:	Mean Square:	F-test:
Between groups	[redacted]	[redacted]	34.3	[redacted]
Within groups	[redacted]	40.2	[redacted]	p = .0001
Total	[redacted]	108.8		

Group:	Count:	Mean:	Std. Dev.:	Std. Error:
Group 1	10	3.4	1.075	.34
Group 2	10	7.1	.738	.233
Group 3	10	5.1	1.663	.526

c. As you noodle around the lab, having completed the analyses that Dr. Ring wanted, you stumble across the original data from the study and realize that Igor had actually run the study as a repeated measures design. This revelation strikes you as a combination of good news and bad news. What's the typical good news about running a repeated measures design? In this particular case, what might strike you as bad news in the design of this repeated measures study? [5 pts]

d. Now that you know that the data were collected as a repeated measures design, you re-compute the analyses appropriately, as seen below. [Notice that the means, etc., aren't displayed below, because they would not change from the earlier analysis, right? Note, also, that other parts of the source table don't change as you move to a repeated measures analysis.] Once again, analyze these data as completely as you can. Given what you know about the relationship between independent groups analyses and repeated measures analyses, the results might surprise you somewhat. However, you can readily explain the anomaly, right? [10 pts]

Source:	df:	Sum of Squares:	Mean Square:	F-test:	P value:
Between subjects	9	4.8	.533	.103	.9993
Within subjects	20	104	5.2		
treatments	2	68.6	34.3	17.441	.0001
residual	18	35.4	1.967		
Total	29	108.8			

4. Suppose that you analyze the results of an independent groups experiment and find that the resulting F has a p-value of .09. After the appropriate cursing, what might you consider doing? (Looking for a new career is not an option.) You should be able to briefly list a number of options available to you. [5 pts]

5. Hunt and his colleagues (1975) have conducted several studies examining the relationship between intelligence and the speed of basic mental processes. In a typical experiment, Hunt measured reaction time for a simple mental task (e.g., determining whether two letters are the same or different) and then computed the correlation between the participants' reaction times and their IQ scores. Hypothetical data representing the results of one experiment are analyzed below. Interpret the results as completely as you can. If you knew that a person had an IQ of 110, what would you predict that person's reaction time to be? [5 pts]

Count:	R:	R-squared:	Adj. R-squared:	RMS Residual:
6	.334	.111	-.111	14.671

Analysis of Variance Table

Source	DF:	Sum Squares:	Mean Square:	F-test:
REGRESSION	1	107.938	107.938	.502
RESIDUAL	4	860.895	215.224	p = .5179
TOTAL	5	968.833		

Beta Coefficient Table

Variable:	Coefficient:	Std. Err.:	Std. Coeff.:	t-Value:	Probability:
INTERCEPT	263.657				
SLOPE	-.408	.577	-.334	.708	.5179

Confidence Intervals Table

Variable:	95% Lower:	95% Upper:	90% Lower:	90% Upper:
MEAN (X,Y)	200.205	233.462	204.065	229.601
SLOPE	-2.009	1.193	-1.638	.821