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Exam 1

PS 306, Fall 2003

As always, the Skidmore Honor Code is in effect and you'll indicate your adherence to the Honor Code when you turn in your exam. Read each question carefully and answer it completely. However, you need not answer in perfect prose, though clarity of expression is crucial (and clarity of handwriting is appreciated). I think of a point as a minute, so (for example) you should expect to spend about 10 minutes in answering a 10-point question. Take a deep breath...and begin. Kick intellectual butt!

1. Briefly define the following terms and explain why each term is important to experimental design. [10 pts]

floor effect

Type I error

random assignment to conditions

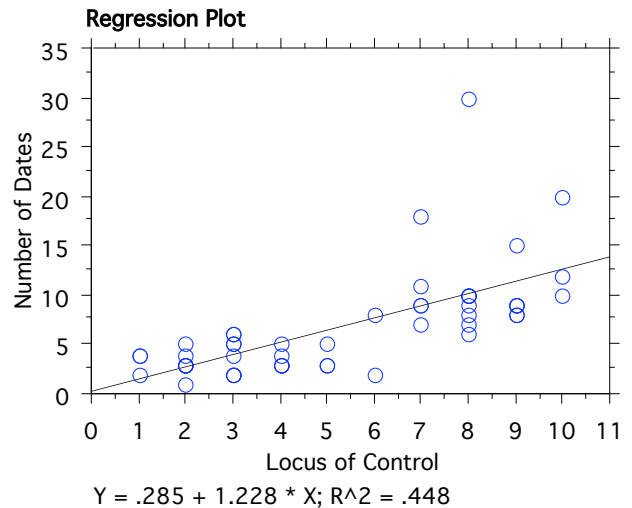
counterbalancing

reliability

2. Dr. Sally Forth is interested in studying the relationship between Locus of Control (a measure developed by Dr. Julian Rotter) and the number of different people that a person has dated. She hypothesized that there would be a positive linear relationship between locus of control and the variety of a person's dating partners (higher locus of control leading to greater number of different people dated). Dr. Forth collected data from 50 college students on her scale of Locus of Control (0 = *Low* and 10 = *High*). Interpret her results (seen below) as completely as you can. If a person had a Locus of Control score of 7, what would be your best estimate of the number of different people that person would have dated? Be very explicit in telling me why you would not be willing to accept the conclusion that one's Locus of Control affected the number of different people one would have dated. [10 pts]

Regression Summary
Number of Dates vs. Locus of Control

Count	50
Num. Missing	0
R	.669
R Squared	.448
Adjusted R Squared	.436
RMS Residual	3.957



ANOVA Table
Number of Dates vs. Locus of Control

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	609.318	609.318	38.918	<.0001
Residual	48	751.502	15.656		
Total	49	1360.820			

Regression Coefficients
Number of Dates vs. Locus of Control

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	.285	1.205	.285	.237	.8138
Locus of Control	1.228	.197	.669	6.238	<.0001

3. Dr. Nomar Gassé was interested in the impact of varying levels of depression on a person's ability to work effectively on a task, especially when tired. He selected people who were not clinically depressed, but who received high scores on the Beck Depression Inventory, as well as people who were diagnosed as clinically depressed and separated them into three groups (Low, Moderate, and Severe Depression). He then kept all participants awake for 48 hours. At the end of the 48-hour period, each participant was given a set of 10 problems to solve. The DV was the number of problems solved correctly in a 30-minute period. Complete the source table below and interpret the results of this study as completely as you can. [15 pts]

ANOVA Table for Prob Solved

	DF	Sum of Squares	Mean Square	F-Value	P-Value	Lambda	Power
Depression				131.89	<.0001	263.781	1.000
Residual			.84				

Means Table for Prob Solved

Effect: Depression

	Count	Mean	Std. Dev.	Std. Err.
Low	15	6.600	.986	.254
Moderate	15	3.333	.976	.252
Severe	15	1.200	.775	.200

4. In Mook's article, he makes an argument about the value of experimental research that is not externally valid. For **three** of the following studies, indicate *why* the research is not externally valid and then tell me *why they are still useful* studies. [10 pts]

Argyle study (glasses and intelligence)

Hecht study (dark adaptation)

Higgins & Marlatt study (anxiety and alcohol consumption)

Brown & Hanlon (parental role in children's acquisition of grammatical speech)

5. In order to study the power of reverse speech (back masking), Dr. Bob Reder had participants listen to music into which backward messages had been explicitly placed. Participants were asked to refrain from drinking any liquids for two hours prior to participating in the study. In the laboratory, each participant listened to four songs. In one song, the backward message was “Coke is heavenly.” In the second song, the backward message was “Drink more Coke.” In the third song, the backward message was “Don’t drink Coke.” And in the fourth song, the backward message was “Coke will kill you.” As they listened to each song, participants had a large container of Coke in front of them and were told that they could drink as much Coke as they wanted. The DV was the number of ounces of Coke consumed during each of the four songs.

First, tell me very explicitly how many participants Dr. Reder should run in his study and how they should be exposed to the songs.

Given the number of participants you propose, complete the following source table and tell me what Dr. Reder could conclude from his study. (You don’t need to know F_{crit} ...right?) [10 pts]

Source	df	SS	MS	F
Subject		40.0		
Treatment				1.0
Error			1.0	

Even though the means for each condition are not provided to you here, what can you tell me about the means of the four conditions?

6. Dr. Rick Call is interested in whether the type of mood reflected by a word (happy, neutral, or sad) affects how well the word is remembered. He constructs a list of 18 words: 6 happy words (e.g., joyful, bright), 6 neutral words (e.g., derive, convey), and 6 sad words (e.g., gloomy, lonely). He then presents the list repeatedly to 30 participants until they can recite the entire list correctly twice in a row. One week later, each participant attempts to recall the entire list. The number of items correctly recalled as a function of the type of word is analyzed. Complete the source table below and interpret the results of this study as completely as you can. [15 pts]

ANOVA Table for Type of Affect

	DF	Sum of Squares	Mean Square	F-Value	P-Value	Lambda	Power
Subject			.95				
Category for Type of Affect				80.7	<.0001	161.436	1.000
Category for Type of Affect * Subject			1.0				

Means Table for Type of Affect

Effect: Category for Type of Affect

	Count	Mean	Std. Dev.	Std. Err.
Happy	30	4.700	.952	.174
Neutral	30	1.633	1.066	.195
Sad	30	4.300	.988	.180