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(you must use official #)

Final Exam

PS 217, Spring 2004

As always, the Skidmore Honor Code is in effect. Read each question carefully and answer it completely — showing all your work. Have a wonderful summer!

1. What is the relationship between power and effect size? That is, when you are considering a research design in which there is a large effect size, what are the implications for power? When you are considering a research design in which there is a small effect size, what are the implications for power? How would you typically add power to a study? [10 pts]

2. How seriously do people take product reviews? Chaiken and Maheswaran (1992) conducted an interesting experiment in which they varied the credibility of the review source and the general message of the review. They asked college students to read a review of a new telephone answering machine. The researchers told half the participants that the review came from a flyer printed by the discount store Kmart (low credibility) or from the magazine Consumer Reports (high credibility). Each participant then read one of three types of review, an unambiguous strong review, an ambiguous review (the answering machine was better than some machines but not as good as others), or an unambiguous weak review. The researchers then asked the participants to rate on a 10-point scale their willingness to buy the answering machine for \$50 (10 = very willing to buy). The results of their study are replicated below. Complete the analysis and interpret the results of this study as completely as you can (as in a Discussion section). [10 pts] {Pittenger}

**ANOVA Table for Rating**

	DF	Sum of Squares	Mean Square	F-Value	P-Value	Lambda	Power
Source Credibility				.05	.8143	.056	.056
Endorsement				33.6	<.0001	67.235	1.000
Source Credibility * Endorsement				24.3	<.0001	48.678	1.000
Residual			1.2				

**Means Table for Rating**

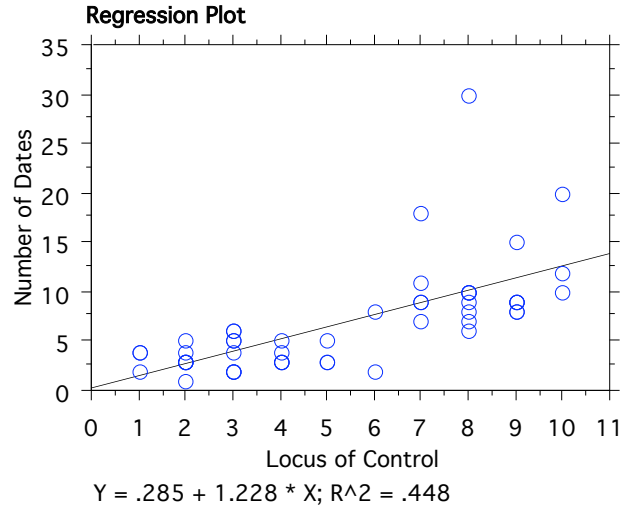
**Effect: Source Credibility \* Endorsement**

	Count	Mean	Std. Dev.	Std. Err.
High, Ambiguous	10	8.000	1.155	.365
High, Strong	10	5.900	1.101	.348
High, Weak	10	3.000	1.155	.365
Low, Ambiguous	10	5.400	.699	.221
Low, Strong	10	6.600	1.174	.371
Low, Weak	10	5.100	1.197	.379

3. 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? If a person had a Locus of Control score of 12, 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

4. 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. [10 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

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]

<b>Source</b>	<b>df</b>	<b>SS</b>	<b>MS</b>	<b>F</b>
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. [10 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

7. Dr. Michael T. Hedd suspects that LSD affects the speech center in the brain. Specifically, he believes that repeated use of LSD is related to a person's ability to retrieve verbal information. To see if he can obtain any evidence regarding his hunch, Dr. Hedd advertises for participants who have taken LSD at least once. Nine people of comparable IQ and education are selected from the applicants. All participants are given a 50-item test. Each item consists of a definition of a low-frequency English word; the participant's task is to produce the target word. Below are two sample items:

Definition	Target Word
to make things thinner or weaker by the addition of water	dilute
patronage bestowed in consideration of family relationship and not merit	nepotism

The dependent variable is the number of failures to produce the target words (errors). Here are the relevant data:

Participant	Number of LSD trips	Number of failures
1	6	6
2	7	11
3	4	6
4	2	0
5	10	13
6	1	2
7	3	1
8	8	9
9	6	9
$\Sigma X$	47	57
$\Sigma X^2$	315	529
$s^2$	8.69	21

Analyze these data as completely as you can. [20 pts] {Johnson}

8. Dr. Mo Shun was interested in the impact of various dosages of a new drug (*Stay Put*) on the activity level of hyperactive children. She is fairly sure that, because of its chemical nature, *Stay Put* will be more effective for males than for females. To that end, she administers four dosage levels (None, Low, Medium, High) of *Stay Put* to an equal number of male and female children who exhibit similar levels of hyperactivity. The dependent variable is an activity measure, with higher numbers indicating greater activity. Analyze and interpret these data as completely as you can. [20 pts] {Johnson}

	Males				Females				
	None	Low	Med	High	None	Low	Med	High	
	10	8	4	3	12	9	3	5	
	11	7	3	4	8	6	6	2	
	8	10	5	5	10	7	5	3	
	7	9	7	2	9	5	2	1	
	12	8	6	7	7	6	3	2	
	4	5	5	1	5	4	4	4	
	8	4	3	3	4	5	2	4	
	6	7	2	1	5	6	3	2	
	8	6	4	4	3	7	3	1	
	9	8	4	2	8	8	5	1	Sum
$\Sigma X (T)$	83	72	43	32	71	63	36	25	425
$\Sigma X^2$	739	548	205	134	577	417	146	81	2847
SS	50.1	29.6	20.1	31.6	72.9	20.1	16.4	18.5	259.3