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Exam 2

PS 217, Spring 2005

As always, the Skidmore Honor Code is in effect for this exam. Read each question carefully and answer it completely, showing all your work. Think of a point as a minute, so spend about as many minutes on a problem as there are points for the problem. Good Luck! Enjoy your weekend!

1a. First of all, imagine a repeated measures design with seven levels. Can you tell me *why* you'd need to counterbalance such a design and what kind of counterbalancing you'd use? What is the impact of counterbalancing on order and carry-over effects? [3 pts]

1b. OK, now let's assume that there is a particular order effect — a practice effect. That means that scores on the DV will improve over time as a result of practice. What is the impact on your error term (MS_{Error}) of counterbalancing? [2 pts]

2. When a stimulus is presented continuously and it does not vary in intensity, the individual will eventually perceive the stimulus as less intense or not perceive it at all. This phenomenon is known as sensory adaptation. Years ago, Zigler (1932) studied adaptation for skin (cutaneous) sensation by placing a small weight on part of the body and measuring how much time elapsed until participants reported that they felt nothing at all. Suppose that a researcher does a similar study, comparing adaptation for 4 regions of the body. A 500-mg weight is placed on the region, and the latency (in seconds) for a report that it is no longer felt is recorded for each participant. Complete the following source table and analyze the results from this experiment as completely as you can. [15 pts]

ANOVA Table for Area of Stimulation

	DF	Sum of Squ...	Mean Sq...	F-Value	P-Value	Lambda	Power
Subject		13.915					
Category for Area of Stimulation		225.967			<.0001	644.523	1.000
Category for Area of Stimulation *...		6.311					

Means Table for Area of Stimulation

Effect: Category for Area of Stimulation

	Count	Mean	Std. Dev.	Std. Err.
Back of Hand	7	5.986	1.022	.386
Lower Back	7	4.129	.588	.222
Middle of Palm	7	9.371	1.083	.409
Chin	7	11.414	.899	.340

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. [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

4. 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 really 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?