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(You need to use your *real* student ID #)

Final Exam

PS306, Spring 1999

As always, the Skidmore Honor Code is in effect, so keep your eyes focused on your own exam. Read each question carefully and answer it completely. Don't hesitate to comment on any aspects of the design of a study that seem problematic to you. Keep in mind that I think of a point as a minute, so don't spend too much (or too little) time on any one question. The exam should take you a little over two hours to complete, which means that no one should be pressed to complete the exam in a three-hour period. Thanks for making my semester an enjoyable one. Have a peaceful and relaxing summer!

1. During class, we broke into groups to read three studies and discuss the extent to which they adhered to the APA ethical guidelines. Choose any *one* of the three studies and briefly describe your reaction to the ethical aspects of the study. Be specific in your application of the guidelines. [10 pts]

This question was intended to benefit the students present in class on the day of the exercise. Essentially, if a student had been present and engaged in the discussion, then that student would know the specifics of the studies discussed, as well as the ways in which they adhered to or violated the APA ethical guidelines.

2. Apply the APA ethical guidelines to *either* of two studies described in your textbook: (1) the West, Gunn & Chernicky study (hint: field study in which participants were invited to participate in an illegal burglary) *or* (2) the Cobb et al. study (hint: heart bypass surgery). Briefly summarize the study, then tell me what guidelines, if any, you feel were violated and whether or not you would approve the research. [10 pts]

This question was intended to benefit those students reading the textbook carefully. Again, with the information in the textbook, you should be able to describe either study and to address the extent to which the study violated any of the APA ethical guidelines.

3. We discussed the problem of experimenter expectancy effects in class. Describe the nature of the problem these effects create and describe the experiments discussed in class that argue for the existence of these effects. Discuss at least two alternatives that might be used in experiments to minimize experimenter expectancy effects. Finally, if experimenter expectancy effects really do exist, why do you think that it might be difficult to prove conclusively that they *do* exist? [15 pts]

Rosenthal has conducted a number of studies related to experimenter expectancy effects. You should be able to talk about the study done to assess the “success” exhibited in faces, the “early data returns” study, the study done with rats and mazes, and the study done with children and IQ. Thus, after selecting which two of the studies you want to describe, you would then talk about how they argue for the presence of experimenter expectancy effects. If these effects exist, you should recognize that their presence would cause great complications in a lot of psychological research. You should be able to talk about a number of strategies that would address the presence of experimenter expectancy effects (e.g., multiple experimenters, written instructions). You should also recognize that *if* these effects exist, then an experimenter who does not believe in their existence should not find them. ☺

4. Deception is certainly allowed in psychological research. First, tell me what the APA guidelines have to say about using deception in research. Then briefly describe the Ross, Lepper, & Hubbard study and tell me what you see as its implications for psychologists using deception in research. [15 pts]

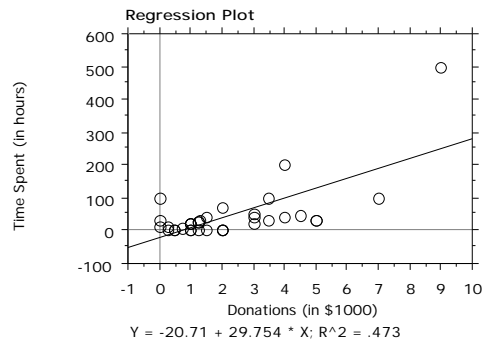
This question is intended to ensure that you understand the APA guidelines — especially regarding deception. Then, using the Ross, et al. article, you need to talk about the difficulty of removing the effects produced in a deceptive experiment. In that context, you should surely discuss the two experiments in the Ross, et al. article as well as the extent to which process debriefing leads to an amelioration of the problems.

5. Dr. Paul Tree was interested in the relationship between charitable donations and time spent in volunteer work in a given year. He expected a positive relationship between the two variables. Below are the results of his initial study. First, interpret them as completely as you can. Then, tell me what amount of time you would expect a person to spend in volunteer work, if that person had donated \$5000 per year. What if a person donated \$10000 in a year? Provide three possible explanations for the observed results, and tell me why such possible explanations make it difficult to arrive at causal claims from correlational data. [20 pts]

Regression Summary

Time Spent (in hours) vs. Donations (in \$1000)

Count	35
Num. Missing	0
R	.687
R Squared	.473
Adjusted R Squared	.457
RMS Residual	65.642



ANOVA Table

Time Spent (in hours) vs. Donations (in \$1000)

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	127374.093	127374.093	29.561	<.0001
Residual	33	142194.479	4308.924		
Total	34	269568.571			

Regression Coefficients

Time Spent (in hours) vs. Donations (in \$1000)

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	-20.710	16.465	-20.710	-1.258	.2173
Donations (in \$1000)	29.754	5.473	.687	5.437	<.0001

First of all, you might make mention of the possibility that one outlier is having an undue effect on the relationship (the one person who donated \$9k). Nonetheless, the linear relationship is significant ($p < .05$), so you could make use of the regression equation. If a person donated \$5k, then you would predict that the person would spend 128 hours in volunteer work. If a person donated \$10k, then you would not really be able to predict, because you didn't observe anyone who had contributed that much. The explanations might be: (1) that contributing \$\$ causes a person to volunteer time; (2) that volunteering time might cause a person to donate \$\$; or (3) some third variable (such as empathy, degree of guilt about family income, etc.) might lead to the observed relationship.

6. Dr. Shirley A. Starr was interested in the impact of the nature of information on memory for that information. To that end, she showed each participant a series of 6 movies in different orders, with a test for the content of the movie given at the end of each movie (high percentages = high memory). The six genres that Dr. Starr used were Science Fiction, Comedy, Action, Romance, Cartoon, and Documentary. Complete the source table below, then analyze the results of this study as completely as you can. [20 pts]

ANOVA Table for Type of Movie

	DF	Sum of Squares	Mean Square	F-Value	P-Value	Lambda	Power
Subject	14	150.289	10.735				
Category for Type of Movie	5	2744.722	548.944	66.315	<.0001	331.577	1.000
Category for Type of Movie * Subject	70	579.444	8.278				

Means Table for Type of Movie

Effect: Category for Type of Movie

	Count	Mean	Std. Dev.	Std. Err.
SciFi	15	81.267	1.534	.396
Comedy	15	80.867	4.673	1.207
Action	15	89.333	2.257	.583
Romance	15	80.800	2.678	.691
Cartoon	15	89.400	3.043	.786
Documentary	15	73.467	2.532	.654

First of all, you should note that even though different orders may have been used, appropriate counterbalancing was not! With 6 conditions, you would need to run in multiples of 6 participants, so 15 wouldn't work.

For this repeated measures ANOVA, you would need to compute a post-hoc test, because the results are significant ($p < .05$). You would have $q = 4.15$ and $HSD = 3.08$. Thus, you could conclude that people remember Cartoon and Action films equally well and both are better than Science Fiction, Comedy, and Romance, all three of which are equal. The Documentary is remembered worst of all.

You may want to comment on the fact that it might be the specific movies used (so maybe using a number of different movies of each genre may make more sense). On the other hand, it may make sense that documentaries are more information laden, so they may contain more information for people to remember (and forget).

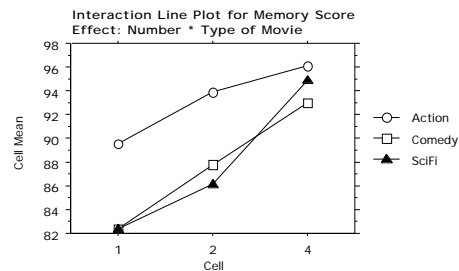
7a. Dr. Ray Gunn was also interested in studying how the nature of the movie would have an impact on memory, so one group watched a science fiction movie, another group watched a comedy, and a final group watched an action movie. At the same time, he was interested in the impact of exposure to various movies on memory for information from the movies. To that end, he had one-third of each group of people watch the movie once, another third watch the movie twice, and a final third of each group watch the movie four times within a 48 hour period, expecting that memory scores would increase with increased exposure. His dependent variable was the score on a test (high percentages = high memory). Below are the results of the study. Interpret these results as completely as you can. [20 pts]

ANOVA Table for Memory Score

	DF	Sum of Squares	Mean Square	F-Value	P-Value	Lambda	Power
Number	2	1483.822	741.911	158.227	<.0001	316.455	1.000
Type of Movie	2	597.756	298.878	63.742	<.0001	127.483	1.000
Number * Type of Movie	4	142.844	35.711	7.616	<.0001	30.464	.998
Residual	81	379.800	4.689				

Means Table for Memory Score
Effect: Number * Type of Movie

	Count	Mean	Std. Dev.	Std. Err.
Four, Action	10	96.100	1.663	.526
Four, Comedy	10	93.000	2.261	.715
Four, SciFi	10	94.900	2.846	.900
Once, Action	10	89.600	1.838	.581
Once, Comedy	10	82.300	3.020	.955
Once, SciFi	10	82.300	2.312	.731
Twice, Action	10	93.900	.994	.314
Twice, Comedy	10	87.800	1.687	.533
Twice, SciFi	10	86.100	2.132	.674



Because the interaction is significant, that's where I would focus my attention. To interpret the interaction, I would first construct a graph (above) and look at the means. It appears that the Sci-Fi and Comedy are similar with 1 or 2 viewings, but at 4 viewings all three types of film are similar. Next, I would compute a post-hoc test to see if the statistical analysis is consistent with what my eyes are telling me. The $q = 4.5$ and $HSD = 3.08$.

Thus, after both one and two viewings, people remember as much from Sci-Fi as from Comedies, with both significantly less than Action flicks. However, after 4 viewings, Action flicks are remembered as well as Sci-Fi flicks, and Sci-Fi flicks are remembered as well as Comedies, but Action flicks are still remembered better than Comedies.

7b. Suppose that Dr. Gunn had obtained exactly the same data set, but had analyzed the data as a single factor experiment with Number of viewing times as the factor (i.e., ignoring the type of movie). What would the results of this single-factor experiment look like?

Source	SS	df	MS	F
Treatment	1483.8	2	741.9	57.5
Error	1120.4	87	12.9	
Total	2604.2	89		

8. Suppose that you were conducting a 3x4 mixed design, with the first factor independent groups (between) and the second factor repeated measures (within). Suppose, also, that you were interested in obtaining a minimum of 30 scores per cell (for power considerations). [10 pts]

a. How many participants would you need to run in your entire experiment? (Show how you arrived at that number.)

To counterbalance (with complete counterbalancing) you would need to run a minimum of 24 participants. Because that's less than the target of 30, you'd need to jump to 48. Then, to have that number for each of the 3 levels of the independent factor would mean a total of 144 participants.

b. What considerations would lead you to run the study as a mixed design, rather than as a completely within (repeated measures) design?

If you could, of course, you would use a completely within design. However, you cannot always do so. Typically, you would shift to a mixed design if you could not repeat a factor for some reason: (1) non-manipulated characteristic of a participant, such as age, gender, etc.; (2) some permanent effect of a manipulation (brain surgery, learning a language); or (3) deception in the study that could not be repeated.

c. Why would you prefer a mixed design to a completely between (independent groups) design?

Issues of power and efficiency would lead you to conduct a repeated measures design.