

As always, keep your eyes focused on your own exam. Read each question carefully and answer the question completely. Try to allocate your time according to the point value of the question. Good luck on this exam. Thanks for making my semester a pleasant one. Enjoy your holiday.

1a. In a study of memory processes, animals were presented with a one-trial avoidance task. As soon as they stepped across a line down the center of their cage they were shocked through a grid in the floor of the cage. Learning (avoidance) would be present if the animals took longer to cross over the line on subsequent trials.

One independent variable in this study is the site at which these animals had electrodes implanted in their brains (Neutral Site, Area A, or Area B). After crossing the line and receiving a shock to their feet, a small amount of electrical stimulation was sent to one of these three sites. Each group was further divided based on the second independent variable — the time delay between crossing the line and receiving electrical stimulation to their brain electrodes. A third of each group was given the stimulation 50, 100, or 150 milliseconds after crossing the line and receiving foot shock.

If the brain area stimulated is involved in memory, stimulation would be expected to interfere with consolidation and retard learning of the avoidance response. The dependent variable was the number of seconds it took the animal to cross the line on the second trial. Thus, longer times to cross the line correspond to greater learning and shorter times correspond to lesser learning.

Below are the means and a partially completed StatView source table for this experiment. Complete the source table and analyze/interpret the results as completely as possible. Be sure to interpret the results in terms of the nature of the experiment. Stim Time (A) represents the delay before stimulating the brain electrode and Stim Site represents to location of the brain stimulation. [25 pts]

**ANOVA Table for DV (Time to cross)**

	DF	Sum of Squares	Mean Square	F-Value	P-Value	Lambda	Power
Stim Time		188.578			.0518	6.434	.571
Stim Place		356.044			.0053	12.147	.868
Stim Time * Stim Place		371.956			.0248	12.690	.770
Residual		1055.200					

**Means Table for DV (Time to cross)****Effect: Stim Time \* Stim Place**

	Count	Mean	Std. Dev.	Std. Err.
100 MS, Neutral Site	5	28.000	4.690	2.098
100 MS, Site A	5	23.000	4.743	2.121
100 MS, Site B	5	16.000	5.612	2.510
150 MS, Neutral Site	5	28.000	5.612	2.510
150 MS, Site A	5	26.800	5.404	2.417
150 MS, Site B	5	26.400	4.159	1.860
50 MS, Neutral Site	5	28.600	7.403	3.311
50 MS, Site A	5	16.800	5.718	2.557
50 MS, Site B	5	24.400	4.722	2.112

1b. Suppose that you had analyzed the *same* data as a one-way ANOVA on Stim Site (i.e., exact same scores, but ignore Stim Time as a factor). How would your source table look for this one-way ANOVA? [10 pts.]

SOURCE	SS	df	MS	F
<hr/>				

Total

2. You've just completed a research proposal. Suppose that later you decide to conduct a senior thesis and you use your proposal from this course as the basis of the thesis. You have several discussions with your advisor about the design of your study, after which the design is substantially changed. You then set up the study, collect all the data and perform analyses on the data. You write your thesis based on the study, but you receive substantial feedback from your advisor, requiring you to undertake substantial revisions to your thesis. You then go on to graduate school, and after a couple of years you hear from your advisor that your thesis is about to be published in a journal article with four other studies, all of which are related to your thesis topic. Your advisor informs you that you are the third of three authors on the paper. Use the Fine & Kurdek paper to analyze the situation and guide you in your response to the advisor's actions. (Note that I'm more interested in your reasoning, using the arguments in the Fine & Kurdek paper, than I am in your ultimate decision about how to respond.) [10 pts]

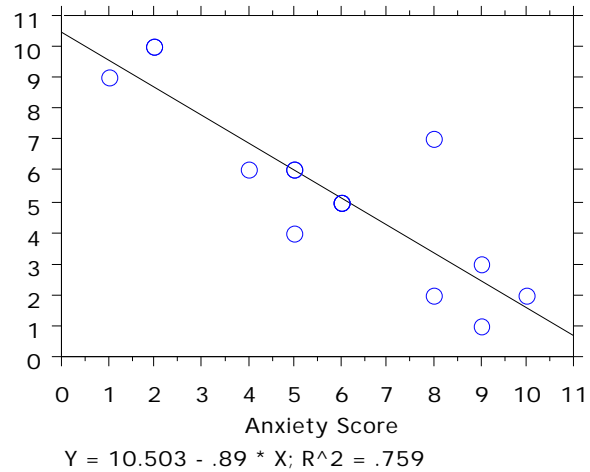
3. An investigator studying the relationship between anxiety and school achievement selects a random sample of 15 fifth-grade students, all aged 10 years. Each student is given an anxiety test (high scores signifying high anxiety) and then these measures are paired with the student's score on an academic achievement test. Below is a set of output from StatView. Interpret the results as completely as you can. *Then*, offer at least three interpretations for the results that you've obtained. [15 pts]

**Regression Summary**  
**Achievement Score vs. Anxiety Score**

Count	15
Num. Missing	0
R	.871
R Squared	.759
Adjusted R Squared	.740
RMS Residual	1.427

Achievement Score

**Regression Plot**



**ANOVA Table**

**Achievement Score vs. Anxiety Score**

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	83.134	83.134	40.836	<.0001
Residual	13	26.466	2.036		
Total	14	109.600			

**Regression Coefficients**

**Achievement Score vs. Anxiety Score**

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	10.503	.879	10.503	11.943	<.0001
Anxiety Score	-.890	.139	-.871	-6.390	<.0001

4. Until the 1960's, people believed that infants had little or no pattern vision during the early weeks or even months of their lives. Fantz was one researcher who showed that infants were, in fact, sensitive to patterns [Fantz, R. L. (1963), Pattern vision in newborn infants, *Science*, 140, 296-297.] Below are data from 14 infants under 48 hours old. They were all exposed to a series of targets, presented in a random sequence to each infant. Three of the targets contained black-and-white patterns: a schematic face, concentric circles, and a section of newspaper. The fourth target was an unpatterned white circle. A blue background was provided in all cases to provide a contrasting background. The dependent variable is the length of gaze (in seconds) of an infant for a particular target. Systematically different lengths of gaze should indicate that the infants could see differences in the targets. Otherwise, they should look at all the stimuli for about the same lengths of time. Complete the source table below, then analyze the results as completely as you can. [15 pts]

**ANOVA Table for Stimulus**

	DF	Sum of Squares	Mean Square	F-Value	P-Value	Lambda	Power
Subject		11.229					
Category for Stimulus		5.992			<.0001	52.508	1.000
Category for Stimulus * Subject		4.451					

**Means Table for Stimulus**

**Effect: Category for Stimulus**

	Count	Mean	Std. Dev.	Std. Err.
Face Pattern Stimulus	14	1.679	.590	.158
Circle Pattern Stimulus	14	1.421	.743	.199
Newspaper Pattern Stimulus	14	.971	.329	.088
White Pattern Stimulus	14	.879	.444	.119

5. According to the APA ethical guidelines, you are allowed to use deception, but only under certain conditions. Clearly specify the conditions under which deception is permissible. Then use the Ross, et al. article to address some important concerns about using deception in psychological research. How would you characterize the impact of knowledge among potential participants about potential deception on their responses in an experiment? You should pay particular attention to the notion of demand characteristics (after defining what they are). [15 pts]

6. Suppose that you are designing an experiment examining the impact of self-esteem and task difficulty on anxiety. You plan to first measure the self-esteem of people, which will allow you to group them as having low, moderate, or high self-esteem. You will then give each of the participants each of 5 different sets of tasks, which vary in difficulty from very easy to very difficult. You decide to use galvanic skin response (GSR) as your dependent variable, so you hook up each participant with electrodes and attach them to your GSR recording device (polygraph). Each participant will work on a set of tasks for 15 minutes (presumably completing more of the easy tasks), after which their GSR will be measured and they will move on to the next task until they've completed all the tasks. Because you think that you're dealing with a fairly weak effect, you are confident that you need at least 50 data points in each of your cells. [15 pts]

a. Describe the nature of this design.

b. How many participants will you need in all? (Show how you obtained your number.)

c. Provide a graph of a set of results that would indicate an interaction between your factors, then explain the source of the interaction.

d. How would you describe your self-esteem variable? What implications would that have on your interpretation?