Final Exam PS 306, Fall 2005

1. As clearly and carefully as you can, articulate the difficulties of removing deception by means of a debriefing. Then, using the studies discussed in the Ross et al. paper, describe the *evidence* that process debriefing may be useful in removing the effects of deception? [10 pts]

Use the Ross et al. paper to answer this question.

2. Dr. I. P. Freeley was interested in replicating the Middlemist et al. study, but using a repeated measures design for greater power. For several days, he had a rotating cadre of confederates (so that the students wouldn't think that someone was stalking them) follow a set of students enrolled in an introductory psychology class. Whenever one of these students would enter a restroom to urinate, a confederate would check to ensure that no one else was using a urinal. If the participant were alone at one of the urinals, the confederate would either: 1) go to the urinal immediately next to the student (Near Stall); 2) go to a urinal one urinal away from the student (Distant Stall); or would simply go to the mirror and comb his hair (Alone). The dependent variable, as in the Middlemist study, was the time (in minutes) between when the unwitting participant unzipped his pants and when he began to micturate. Complete the source table below and interpret these data as completely as you can. [10 pts]

ANOVA Table for Distance

	DF	Sum of Squares	Mean Square	F-Value	P-Value	Lambda	Power
Subject	9	1.228	.136				
Category for Distance	2	2.282	1.141	111.217	<.0001	222.433	1.000
Category for Distance * Subject	18	.185	.010				

Means Table for Distance
Effect: Category for Distance

	Count	Mean	Std. Dev.	Std. Err.
Alone	10	.550	.227	.072
Distant Stall	10	.560	.196	.062
Near Stall	10	1.140	.259	.082

There is a significant effect of the Presence/Distance of another person, $F(2,18) = 111.217$, $MSE = .01$, $p < .001$. Post hoc analysis was conducted using Tukey's HSD:

$$HSD = 3.61\sqrt{\frac{.01}{10}} = .11$$

Men with another man at the near stall took significantly longer to begin urination (M = 1.14) than men with another man at a distant stall (M = .56) or men who were alone in the restroom (M = .55).

3. Correlational designs do not allow you to make casual claims. Why not? Be very explicit about the difficulty of claiming that changes in one of the two variables in a correlational study *causes* the related changes observed in the second variable. We also discussed the shortcomings of using non-manipulated characteristics of the participants as "independent variables" in an experiment. How is this class of variable related to the notion of correlational designs? [10 pts]

Cannot make causal claims because of the *causal arrow problem* and the *third variable problem*, which you should define clearly. You also need to be clear about the lack of manipulation in an "experiment" in which you use a non-manipulated characteristic of the participants (e.g., age, intelligence) as your "independent variable." The primary problem in such studies, of course, is that if you find a difference you cannot be certain that the effects are due to the variable of interest or some other (i.e., third) variable.

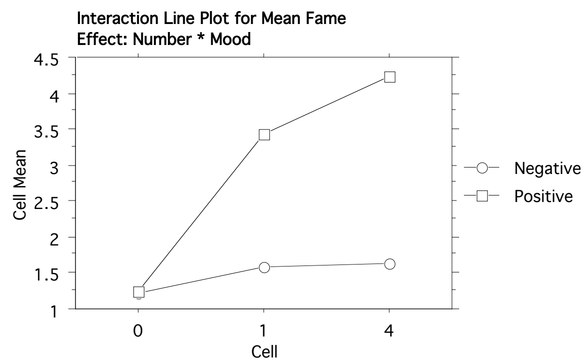
4. Kitamura (2005) was interested in the impact of mood on cognitive processes. Kitamura thought that a positive mood leads to more automatic processing than a negative mood, which leads to more controlled processing. In one study, half of the participants were placed in a positive mood and half in a negative mood (using a mood induction technique). Then they were all given a list of non-famous companies either once or four times. Two days later they were asked to judge the fame of a list of companies, including ones that had been seen previously. Let's pretend that the participants rated fame on a 7-point Likert-type scale (1 = "not famous" and 7 = " famous"). Suppose that the data had produced the results seen below. Complete the analysis and interpret the results, including a brief discussion (as you might find in a Discussion section). [20 pts]

ANOVA Table for Mean Fame

	DF	Sum of Squares	Mean Square	F-Value	P-Value	Lambda	Power
Number	2	38.110	19.055	50.168	<.0001	100.337	1.000
Mood	1	39.902	39.902	105.055	<.0001	105.055	1.000
Number * Mood	2	21.012	10.506	27.660	<.0001	55.320	1.000
Residual	66	25.068	.380				

Means Table for Mean Fame
Effect: Number * Mood

	Count	Mean	Std. Dev.	Std. Err.
0, Negative	12	1.208	.178	.051
0, Positive	12	1.233	.183	.053
1, Negative	12	1.583	.327	.094
1, Positive	12	3.425	.748	.216
4, Negative	12	1.633	.487	.141
4, Positive	12	4.233	1.144	.330



There was a significant main effect of number of presentations, *F*(2,66) = 50.168, *MSE* = .38, *p* < .001. There was also a significant main effect of mood, *F*(1,66) = 105.055, *MSE* = .38, *p* < .001. There was also a significant interaction between Number and Mood, *F*(2,66) = 27.66, *MSE* = .38, *p* < .001. To interpret the interaction, you would first compute Tukey's HSD:

$$HSD = 4.15\sqrt{\frac{.38}{12}} = .74$$

Thus, when people had not seen the company names previously (0 presentations), regardless of mood, they rated the names as equally famous. However, if they had seen the company's name either once or four times previously, they rated the companies as more famous if they had been in a positive mood than if they had been in a negative mood.

These results would be consistent with the underlying hypotheses. That is, if being in a positive mood leads you to engage in more automatic processing, then it seems that people are automatically taking in the number of times that a company name appears. Then, when later asked if the company names are famous, they rate them as relatively famous (consistent with Zajonc's *Mere Exposure Effect*). On the other hand, if they are in a negative mood, they tend to process the information in a more conscious, controlled fashion, which may lead them to be less likely to encode the company names (even if presented four times). As a result, they don't think that the company names are all that famous when later asked.

5. While discussing ethics in research involving human participants, you broke into groups to discuss the ethics of three particular studies. Using only one of the *specific studies* that your group discussed that day, tell me here how you used the APA guidelines to respond to that particular study. If you thought it was unethical, tell me why. If you thought that the study was ethical, tell me why. [10 pts]

Use the studies you discussed in class to respond to this question.

6. In the Fine & Kurdek (1993) article, the authors use four different hypothetical cases to make the point that determining authorship in faculty-student collaborative research projects is often complex. They outline a number of principles that they think should guide such decisions. Briefly describe those principles, then briefly describe some recommendations for determining authorship that emerge from those principles. Then, consider the following scenario. Suppose that you completed a senior thesis under the supervision of one of the faculty in our department. Suppose that your thesis work later was incorporated in an article written by the faculty person, along with several other studies. Using the principles and recommendations articulated by Fine & Kurdek, tell me the conditions under which you think that your contribution to the paper should be acknowledged with authorship. [10 pts]

Use the Fine and Kurdek article to respond to this question.

7. Dr. Ryan Deere is interested in studying the impact of alcohol consumption and sleep deprivation on driving behavior. Thus, he decides to use a two-factor independent groups design to address these issues. He uses three levels of alcohol consumption (in ounces): 1, 2, and 3 ozs. He also uses four levels of sleep deprivation: 24, 48, 72, and 96 hours. The dependent variable is the number of errors made on a driving simulator. Before taking the driving test, a participant is asked to go without sleep for one of the four times specified (e. g., 48 hours), then asked to drink a glass of orange juice laced with one of the three amounts of vodka (e.g., 3 ozs.). The number of errors made in the course of the test is recorded, then the participant is debriefed and excused. Complete the source table below and interpret the results of this study as completely as you can. [15 pts]

ANOVA Table for Errors

	DF	Sum of Squares	Mean Square	F-Value	P-Value	Lambda	Power
Amt Alcohol	2	686.625	343.312	233.193	<.0001	466.387	1.000
Sleep Dep	3	616.500	205.500	139.585	<.0001	418.755	1.000
Amt Alcohol * Sleep Dep	6	16.875	2.812	1.910	.1058	11.462	.624
Residual	36	53.000	1.472				

Means Table for Errors
Effect: Amt Alcohol

	Count	Mean	Std. Dev.	Std. Err.
1	16	8.000	3.307	.827
2	16	11.562	3.669	.917
3	16	17.188	4.622	1.155

Means Table for Errors
Effect: Sleep Dep

	Count	Mean	Std. Dev.	Std. Err.
24	12	7.667	3.367	.972
48	12	10.417	3.753	1.083
72	12	13.667	4.499	1.299
96	12	17.250	4.808	1.388

There is a main effect of the amount of alcohol, $F(2,36) = 233.193$, $MSE = 1.472$, $p < .001$. There is also a main effect of sleep deprivation, $F(3,36) = 139.585$, $MSE = 1.472$, $p < .001$. Finally, there is no significant interaction between amount of alcohol and sleep deprivation, $F(6,36) = 1.91$, $MSE = 1.472$, $p = .106$. You would need to compute two different Tukey HSD values to interpret the two main effects:

Alcohol: $HSD = 3.45\sqrt{\frac{1.472}{16}} = 1.05$ **Sleep Deprivation:** $HSD = 3.81\sqrt{\frac{1.472}{12}} = 1.33$

Thus, for alcohol, people with 3 ozs. of alcohol made more errors (*M* = 17.188) than those with 2 ozs. (*M* = 11.562) or with 1 oz. (*M* = 8.0). Moreover, those with 2 ozs. of alcohol made more errors than those with only 1 oz. of alcohol. For sleep deprivation, people with 96 hours of sleep deprivation made more errors (*M* = 17.25) than those with 72 (*M* = 13.667), 48 (*M* = 10.417), or 24 hours of deprivation (*M* = 7.667). Those with 72 hours of deprivation made more errors than those with 48 or 24 hours of deprivation and those with 48 hours of deprivation made more errors than those with 24 hours of deprivation.

Note, however, the absence of important control groups for alcohol (0 oz. alcohol) and for sleep deprivation (0 hours of deprivation).

8. Dr. Gus Tatory is interested in the extent to which participants like particular combinations of color and food. He first creates 7 different combinations (e.g., green eggs, pink mashed potatoes, etc.). He is also interested in the extent to which the accompanying beverage will influence the judgments, so he also has five different drinks (water, cola, beer, tea, and hot chocolate). Thus, Gus is using a two-factor design (7x5). His dependent variable is the participant's rating of the food on a 9-point scale (1 = yuck, 9 = yum). Suppose, further, that (for reasons of power) he expects to have at least 30 scores in each of the cells. [15 pts]

a. If he ran this study as a completely between (independent groups) design, how many total participants would he need? **1050**

b. If he ran this study as a completely within (repeated measures) design, how many total participants would he need? **70**

c. If he ran this study as a mixed design, with the five different beverages as the between (independent groups) factor and the seven different food/color combinations as the within (repeated measures) factor, how many total participants would he need? **210**

d. If it were up to you, which design would you choose to use? Why?

The independent groups design would require too many participants. The repeated measures design would require that the participants do too much eating and drinking. Thus, I'd probably go with the mixed design, even though it still means that participants will end up eating seven different food/color combinations.

9. Two researchers were interested in studying the effects of reward magnitude on performance. Both researchers used introductory psychology students as participants, the same total number of participants (21), the same type of reward and reward magnitudes ($1, $5, $20), the same apparatus, the same task, and the same performance measure (DV). One researcher used an independent groups design and, on the basis of the results, cannot reject the null hypothesis (that reward has no effect on performance). The other researcher uses a repeated measures design and finds a statistically significant effect of reward magnitude — larger rewards lead to better performance. Assume that neither study has a major flaw (e.g., repeated measures design is properly counterbalanced, random assignment to conditions). There are two fundamental reasons why the two researchers might have reached different conclusions. One reason concerns the sensitivity of the test of the null hypothesis. The other reason concerns the nature of the participant's experience in the two studies (what you might think of as the demand characteristics). Provide me with a clear explanation of the two reasons for the different results that the two researchers obtained. Would you trust the results of one study more than the other? Why? Finally, complete the source tables for the two experimenters seen below. [15 pts]

Independent Groups Design (F_{Crit} = 3.55):

Source	*df*	*SS*	*MS*	*F*
Treatment	2	28	14	3.5
Error	18	72	4	
Total	20	100		

Repeated Measures Design (F_{Crit} = 3.23):

Source	*df*	*SS*	*MS*	*F*
Subject	20	100	5	
Treatment	2	20	10	5
Error (Subj x Treat)	40	80	2	
Total	62	200		

The repeated measures design is more powerful, and in this example would have more data (and more *df*). Thus, it's no surprise that the repeated measures design would lead to a larger *F*-ratio. It's also possible that the data in the independent groups ANOVA led to a Type II error or that the data in the repeated measures design led to a Type I error. From a design perspective, you should note that there may be some substantial impact of carryover effects in the repeated measures design. That is, regardless of the order in which you get the rewards, you may well be influenced by the fact that your reward has gotten smaller or larger for arbitrary reasons (a counterbalancing order), which may lead you to perform differently. ("Heck, I just got $20 for the same task, why should I work as hard for $1 or $5.") It's also the case that with complete counterbalancing, you would have six orders, so with *n* = 21 not all of the orders would have been used equally often, which is a problem. Thus, I might well trust the results of the independent groups design here, though I'd prefer to have results that I could publish. ☺