

1. The Ross, et al. article is important because of its demonstration that debriefing may not be sufficient to remove the effects of deceptive feedback. Using the two studies in that article, illustrate the perseverant effects of deception and the way that process debriefing may be able to minimize the impact of such deception. [10 pts]

**To answer this question completely, you need to provide sufficient detail about both studies in the Ross, et al. article. You need to argue for the benefits of using the process debriefing approach.**

2. Dr. Maureen Katz was interested in conducting research on the impact of a new drug (SuperMethAmphetaRootaToluene) on learning. She decides to use cats as her subjects, and the time it takes them to complete a maze as an indication of their speed of learning. Her cats are given either a small dose, a medium dose, or a large dose of SMART. Use the data below to complete the source table and then tell Dr. Katz what she should do next. It may help to recall that the standard deviation is the square root of the variance. [15 pts]

ANOVA Table for Time

	DF	Sum of Squares	Mean Square	F-Value	P-Value	Lambda	Power
Group	2	6.000	3.000	3.000	.1250	6.000	.377
Residual	6	6.000	1.000				

Means Table for Time

Effect: Group

	Count	Mean	Std. Dev.	Std. Err.
Large Dose	3	6.000	1.000	.577
Med Dose	3	5.000	1.000	.577
Small Dose	3	4.000	1.000	.577

**The P-Value is  $> .05$ , so you would retain  $H_0$ . You should then contemplate ways in which you could enhance the power of the experiment. The most obvious first step would be to add data (Mo Katz!). Only 3 cats per cell is probably too few. Next, you could think of ways to increase the treatment effect by making the groups more different in their treatment. In that context, you need to note the confound created by the absence of a Zero Dose control group. Simply adding that condition would make the treatment effect larger. You could also think of ways to decrease the error term, such as using a repeated measures design (probably wouldn't work for this experiment), making your cats more similar (litter mates, same strain, etc.) and making the experimental setting as similar as possible to eliminate random variability.**

3. Dr. Tex Reeder was interested in the impact of some factors on the memory for text. Texts were presented to readers one word at a time at one of three rates (300, 450, or 600 words per minute). For half the participants at each rate, the texts were intact (ordinary sentence structure) and for the rest of the participants they were scrambled (order of the words in the sentence was scrambled). Thus, this is a 3x2 independent groups design. The dependent variable is the percentage of idea units recalled from the texts. Below are the source table and a summary table. Complete the source table and analyze the data as completely as possible. [20 pts]

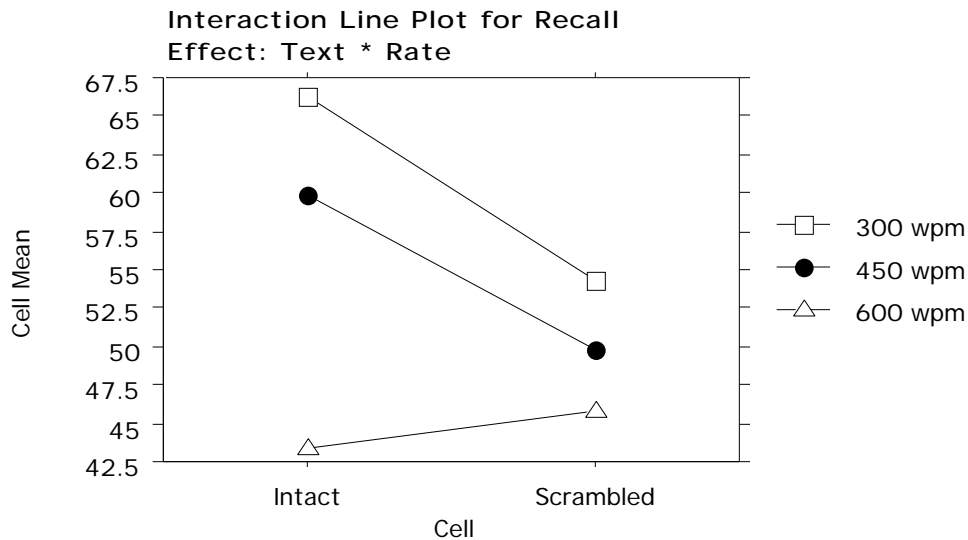
**ANOVA Table for Recall**

	DF	Sum of Squares	Mean Square	F-Value	P-Value	Lambda	Power
Text	1	507.000	507.000	8.201	.0065	8.201	.811
Rate	2	2027.375	1013.688	16.397	<.0001	32.794	1.000
Text * Rate	2	492.125	246.062	3.980	.0261	7.960	.681
Residual	42	2596.500	61.821				

**Means Table for Recall**

Effect: Text \* Rate

	Count	Mean	Std. Dev.	Std. Err.
Intact, 300 wpm	8	66.250	8.276	2.926
Intact, 450 wpm	8	59.875	8.919	3.153
Intact, 600 wpm	8	43.375	9.023	3.190
Scrambled, 300 wpm	8	54.375	5.829	2.061
Scrambled, 450 wpm	8	49.750	7.226	2.555
Scrambled, 600 wpm	8	45.875	7.434	2.628



**Because the interaction is significant ( $F(2,42) = 3.98$ ,  $MSe = 61.8$ ,  $p < .05$ ), I would focus my attention on explaining the interaction. From the graph, it should be clear how the lines are not parallel. To assess which differences are significant, I would compute  $HSD = 11.7$ . I would then conclude that when the words were intact, 300 and 450 wpm didn't differ in terms of the % of words remembered and both resulted in significantly more words remembered than the 600 wpm group. However, when the words were scrambled the three rates of presentation did not result in differences in % of words remembered.**

4. Psychologists have become increasingly interested in the role of perceived control as it affects individuals' abilities to cope with stress. [This exercise is modeled after Bandura, et al. (1985). Catecholamine secretion as a function of perceived coping self-efficacy. *Journal of Consulting and Clinical Psychology*, 53, 406-414.] They hypothesized that perceived coping self-efficacy would mediate the effects of an environmental stressor on hormone secretions indicative of a physiological response to stress. Twelve individuals with phobic dread of spiders served as participants. They each rated their perceived coping self-efficacy for 18 tasks requiring increasingly threatening interactions with a large spider. Three of the 18 tasks were individually selected for each participant, so as to have one strong, one medium, and one weak self-efficacy task for each participant. Participants were then individually instructed to perform each of their three tasks in a counterbalanced order. In reality, no participant was able to perform the weak perceived self-efficacy task. The dependent variable to be considered here (level of norepinephrine secretion), was one of several physiological measures obtained from each participant. Complete the source table and interpret these data as completely as you can. [15 pts]

ANOVA Table for Task

	DF	Sum of Squares	Mean Square	F-Value	P-Value	Lambda	Power
Subject	11	.124	.011				
Category for Task	2	.037	.019	4.216	.0282	8.432	.677
Category for Task * Subject	22	.097	.004				

Means Table for Task

Effect: Category for Task

	Count	Mean	Std. Dev.	Std. Err.
Strong	12	.278	.086	.025
Medium	12	.354	.083	.024
Weak	12	.298	.077	.022

**Because the P-Value is < .05, we would reject  $H_0$ . To determine which of the means differed, we need to compute HSD. In this case,  $HSD = .06$ . Thus, a Medium self-efficacy task leads to a significantly greater release of norepinephrine than a Strong self-efficacy task. No other differences were significant.**

5. Throughout the semester (or throughout your career as a student of psychology) you've been exposed to a large number of studies in psychology. Surely at least one of those studies should strike you as unethical. (Even Andrew!) What I would like you to do is to briefly describe one psychological study that you consider to be unethical and, using the APA guidelines, clearly articulate the points of the guidelines that were violated by the study. [10 pts]

**Lots of degrees of freedom in answering this question. After choosing the study, you must use the APA guidelines to determine the extent to which the study is consistent with the guidelines.**

6. Generally speaking, repeated measures designs are valuable because they are more powerful and more efficient. You can illustrate the efficiency of repeated measures designs in a number of ways. One simple way is to determine the number of participants needed to complete particular multifactor designs. Suppose that you are considering a 3x6 design. Determine the number of participants needed for each of the following designs, with the further stipulation that you need to have at least 25 scores per cell. (Show your work in each case.) [20 pts]

a. completely between design needs 450 participants

b. mixed design with the 3-level factor between and the 6-level factor repeated needs 90 participants

c. mixed design with the 3-level factor repeated and the 6-level factor between needs 180 participants

d. completely repeated design needs 36 participants

The results above should illustrate the efficiency of the repeated measures design. You also know that the repeated measures design is more powerful. Given the efficiency and power of repeated measures designs, why would anyone ever design an independent groups study?

**Use an independent group design whenever a repeated measures design is inappropriate. For example, when using deception, it's rarely possible to continually deceive a person, so an independent groups design is more appropriate. Whenever a permanent change results from the treatment (e.g., physical damage, learning a concept), a repeated measures design cannot be used. You cannot use a repeated measures design when looking at nonmanipulated characteristics of the participant (e.g., gender, race).**

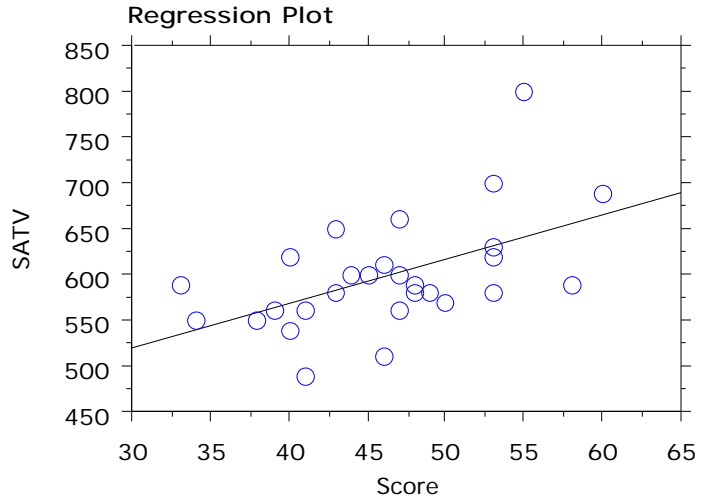
Under what conditions would the repeated measures design *not* be more powerful than an independent groups design?

**Whenever the individual differences among the participants are not that large, you will end up with a larger error term in a repeated measures design (due to the loss of degrees of freedom).**

7. Most of us do reasonably well if we study a body of material and then take an exam on the material. But how would we do if we just took the exam without even looking at the material. (I presume that none of you are trying that right now! ☺ ) Katz, et al. (1990) examined that question by asking some students to read a passage and then answer a series of multiple-choice questions about the passage, and asking other students to answer the questions without reading the passage. If people are able to do well in the second group, it's presumably because they have good test-taking skills. If so, then they should also do well on standardized tests like the SAT Verbal (SATV). Below are scores from the people who hadn't read the passage (Scores) and their performance on the SATV. Interpret the results of this study as completely as you can. If someone received a Score of 50 (on the unread passage), what SATV score would you predict for that person? What proportion of the variability of SATV scores is shared by Scores on the passage? [10 pts]

**Regression Summary**  
SATV vs. Score

Count	28
Num. Missing	0
R	.532
R Squared	.283
Adjusted R Squared	.255
RMS Residual	53.134



**ANOVA Table**  
SATV vs. Score

	DF	Sum of Squares	Mean Square	F-Value	P-Value
Regression	1	28940.123	28940.123	10.251	.0036
Residual	26	73402.734	2823.182		
Total	27	102342.857			

**Regression Coefficients**  
SATV vs. Score

	Coefficient	Std. Error	Std. Coeff.	t-Value	P-Value
Intercept	373.736	70.938	373.736	5.269	<.0001
Score	4.865	1.520	.532	3.202	.0036

**First of all, you should note that there is a significant positive linear relationship between the score on the passage and SATV score,  $r = .532$ ,  $p = .0036$ . The proportion of variability shared between the two variables is determined by  $r^2$  (the coefficient of determination), which is .283 (or roughly 28% of the variability is shared). A score of 50 would lead to a prediction of 617.0 on the SATV (using the regression equation).**