

As always, the Skidmore Honor Code is in effect, so at the end of the exam you will need to sign a sheet attesting to your adherence to the code. Read each question carefully and answer it completely. Be sure to show all your work, otherwise I cannot give you partial credit for your work. Remember to think of a point as a minute, so you should expect to spend roughly 15 minutes on a 15-point question, etc. If a question is unclear to you, be sure to ask me for clarification. Good luck on the exam.

1. Liljenquist et al. (2010) published a paper (*The smell of virtue: Clean scents promote reciprocity and charity*) that included a study described as follows:

Experiment 1 tested the impact of clean scents on reciprocation of trust. Twenty-eight participants were individually assigned to either a clean-scented room or a baseline (regular-smelling) room. The only difference between these rooms was a spray of citrus-scented Windex in the clean-scented rooms.

In both conditions, participants engaged in a one-shot anonymous trust game involving two parties: a sender and a receiver. In a typical trust game, the sender is given money that he or she can either keep or “invest” with an anonymous receiver. Any money sent is tripled, and the receiver then decides how to split the tripled money. For example, if the sender invests all of the money and the receiver reciprocates this trust by returning half of the tripled amount, both parties would be better off. However, sending money can be risky if the receiver chooses to exploit the sender and keep all the invested money.

All participants in Experiment 1 were told that they had been randomly assigned to play the role of the receiver and that their ostensible counterpart had decided to send them the full amount (\$4), which was tripled to \$12. They had to decide how much money to return to the sender. Participants could exploit the sender by keeping all the money, or they could honor the trust by returning some portion to the sender. Below are the data from the experiment. Analyze the data as completely as you can (e.g., creating a source table for the ANOVA) and interpret the results. (You have sufficient information below, but to make your computations easier, I’ll also tell you that $F_{\text{Obtained}} = 7.44$.) [15 pts]

	Baseline (Regular) Room	Clean-Scented Room
M	\$2.81	\$5.33
s^2	7.90	4.04
n	14	14

2. Not only are repeated measures designs more powerful than independent groups designs, they are also more efficient (“more bang for the buck”). Suppose that you have a study with four conditions ($k = 4$). If you want to have at least 20 scores per condition, how many people would you need in a repeated measures study? In an independent groups study? [3 pts]

3. Power is an important concept, with people like Jacob Cohen suggesting that we should conduct experiments with power of at least .80. What are they saying about the level of Type II error that they are willing to tolerate? [2 pts]

4. Recently Simone Schnall and her colleagues published a paper in *Psychological Science*:

Schnall, S., Roper, J., & Fessler, D. M. T. (2010). Elevation leads to altruistic behavior.

From their abstract:

Feelings of elevation, elicited by witnessing another person perform a good deed, have been hypothesized to motivate a desire to help others. However, despite growing interest in the determinants of prosocial behavior, there is only limited evidence that elevation leads to increases in altruistic behavior... Feelings of elevation, but not feelings of amusement or happiness, predicted the amount of helping. Together, these results provide evidence that witnessing another person's altruistic behavior elicits elevation, a discrete emotion that, in turn, leads to tangible increases in altruism.

From their Procedure section:

Participants were informed that they were taking part in a 1-hr experiment on episodic memory in which they would watch a film clip, write about it, and complete a 30-min computer task. Tested individually, participants were randomly assigned to watch the elevation film clip from the Oprah Winfrey Show (elevation condition), the control film clip (the first 7 min of “The Open Ocean,” David Attenborough's (1984) nature documentary describing a journey through the deepest part of the ocean), or a clip from a British comedy (“Fawlty Towers”) intended to induce mirth (mirth condition).

The experimenter then feigned three unsuccessful attempts to open the computer file that ostensibly needed to be completed by the participant. She then told the participant that, because it was impossible to complete the next part of the study, the participant was free to leave, but would still receive the full hour's worth of course credit. Following the procedure outlined in Bartlett and DeSteno (2006), when the participant got up to leave, the experimenter asked, apparently as an afterthought, whether she would be willing to complete another questionnaire, ostensibly from another study for which the experimenter needed to establish norms. The experimenter noted that the questionnaire was, unfortunately, rather boring, emphasizing that the participant was under no obligation, and was free to stop whenever she wanted, but that completing any number of the items would greatly assist the experimenter. If the participant agreed to help, she was seated at a desk, reminded that she was free to stop whenever she wished, and given 85 elementary math problems. The participant's work on the problems was secretly timed (the dependent variable in the experiment, time spent on the task). The participant was then probed for suspicions regarding the purpose of the study and debriefed.

The results from the study were analyzed as illustrated in the incomplete source table below. First, complete the source table below, then analyze the results as completely as you can. [15 pts]

Descriptives

Time

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Elevation	11	40.6364	17.06032	5.14388	29.1751	52.0976	18.00	63.00
Control	11	19.9091	8.36008	2.52066	14.2927	25.5255	10.00	32.00
Mirth	11	23.7273	14.06479	4.24069	14.2784	33.1761	8.00	48.00
Total	33	28.0909	16.07087	2.79758	22.3924	33.7894	8.00	63.00

Test of Homogeneity of Variances

Time

Levene Statistic	df1	df2	Sig.
4.915	2	30	.014

ANOVA

Time

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2677.1				.003
Within Groups	5587.6				
Total	8264.73				

5. Two researchers were interested in studying the effects of reward magnitude (the IV) on performance. Both researchers used the same independent variable, with three levels of reward magnitudes (\$1, \$5, \$20). They used the same pool of introductory psychology students as participants, the same total number of participants (24), the same apparatus, the same task, and the same performance measure (DV). One researcher used an independent groups design and the other researcher used a repeated measures design. Assume that neither study has a major flaw (e.g., repeated measures design is properly counterbalanced, random assignment to conditions). In each case, the researchers used $\alpha = .05$. Complete the source tables for the two experimenters seen below, then make a decision about the $H_0: \mu_{\$1} = \mu_{\$5} = \mu_{\$20}$. Explain *why* you might expect the decisions to differ? [10 pts]

Independent Groups Design:

Source	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>
Between	12			
Within				
Total	54			

Repeated Measures Design:

Source	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>
Between	20			
Within				
Subject	23			
Error (Subj x Treat)				
Total	66			

6. Although psychologists do not completely understand the phenomenon of dreaming, it does appear that people need to dream (or, at the very least, need REM sleep). One experiment demonstrating this fact shows that people who are deprived of REM sleep one night tend to have more REM sleep (dreams?) the following night, as if they were trying to make up for the lost REM sleep. In the experiment reported below, the psychologist first records the number of periods of REM sleep during a normal night's sleep. The next night, each participant is prevented from REM sleep by being awakened as soon as he or she begins to exhibit REM sleep. During the third night (Night After Deprivation), the psychologist once again records the number of periods of REM sleep. Finally, on the following night, the periods of REM sleep is again recorded. Hypothetical data from this experiment are seen below. Analyze and interpret these results as completely as you can. [20 pts]

Participant	First Night	Night After Deprivation	One Night Later
1	4	7	5
2	5	5	6
3	4	8	5
4	6	7	5
5	4	9	8
6	5	7	6
7	4	7	5
8	4	6	6
Sum (<i>T</i>)	36	56	46
ΣX^2	166	402	272
<i>SS</i>	4	10	7.5