

**24 points; 16% of your grade in the course.**

- Answer every question with your best guess as to the one answer that is “most correct”
- If you believe a question is ambiguous, write out your reasoning in the margin

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1. In a factorial design, what is a main effect?

**(1 point)**

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2. What is a Type I Error? What is a type II error?

**(1 point)**

TYPE I:

TYPE II:

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3. Consider the following two survey questions:

***“Do you prefer your burgers fried or flame-broiled?”***

and

***“Do you prefer a hamburger that is grilled on a hot stainless grill or cooked by passing the raw meat through an open propane flame?”***

What difficulty do you see with these two questions?

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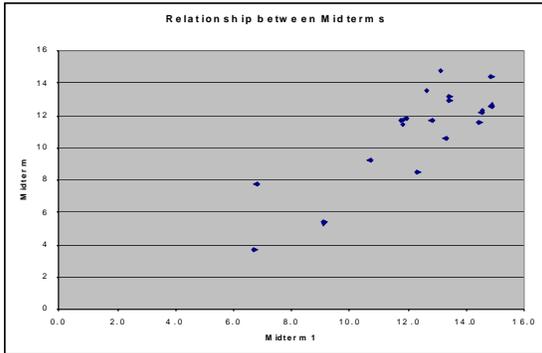
4. Define each of the following:

**(1 point)**

- a) Manipulation check
- b) Demand characteristic
- c) Participant Variable
- d) Reactivity

5. This figure shows the relationship between grades on the two midterm exams (excluding 3 students who did not write the second midterm).

**(1 point)**



This type of graph is called a \_\_\_\_\_.

The words that might appear underneath this graph in the final version of the journal article would be called the : \_\_\_\_\_.

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6. In an investigation of the effectiveness of various memory strategies, 100 participants were randomly divided between two groups. One group received “imagery”-based memory instructions. The other group received “repetitive silent speech”-based memory instructions. After receiving the instructions, each participant was given a list of 36 words to remember. Each participant was then tested, allowed to study again, and then retested until they could recite the entire list without error. A week later the experimenter asked each participant to write down as many words as they could recall. The participants in the imagery group recalled an average of 25.2 words. The participants in the repetition group recalled an average of 21.1 words.

- Of the following choices, which statistical test should be used to compare the number of words recalled (after the one week delay) across the two instruction conditions?

**(1 point)**

- a) Chi-square
- b) 2 x 2 between-subjects ANOVA
- c) Matched-sample t-test
- d) Independent groups t-test

7.

- Describe your reasoning (i.e., why did you choose that test)

**(1 point)**

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8. What is the fundamental difference between inferential and descriptive statistics?  
**(1 point)**

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9. I am interested in training Extra-Sensory Perception (ESP). To maximize the chance for learning to take place, I select my sample based on abysmal performance on an ESP screening test (i.e., I wanted people with very little ESP). Through my \$10,000 weekend retreat, I have each person get in touch with his or her "inner psychic". The vast majority of the participants score higher on the ESP test after the weekend retreat than they did on their pre-test. Which confound does this illustrate?  
**(1 point)**

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10. Consider an experiment in which each of sixteen participants rates the "attractiveness" of each of eight photographs. Each model appears in two photographs. In one version the model is wearing "unlabelled" clothing (e.g., a plain white collared shirt, plain tan khaki shorts, standard brown belt, and a pair of generic flip-flops). In the other photograph of each pair the participant is wearing "branded" clothing (e.g., Guess shirt; Calvin Klein Belt; Banana Republic Shorts; and Airwalk flip-flops).  
**(1 point)**

(i) Is this a within or between subject design?

(ii) What is the IV?

(iii) What is the appropriate analysis? Which statistical technique would you use? How you would process the data?

(iv) what problem do you notice in the design?

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11. What are the three methodological approaches to research methods (e.g., experimental)? Indicate what each is used for and/or a strength of each approach? **(1 point)**

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12. We have 28 subjects for an experiment that we plan to run. In a 2 x 2 mixed factorial design with one between-subject factor (2 levels) and one within-subject factor (2 levels): **(1 point)**

- a 2 x 2 ANOVA procedure would test for: \_\_\_\_ main effect(s) and \_\_\_\_ interaction(s).
- How many participants would there be in each experimental cell? \_\_\_\_

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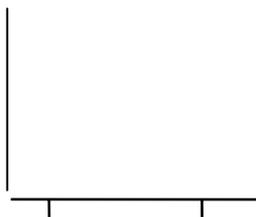
13. Provide an example of an indirect measure. **(1 point)**

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14. Consider a 2 x 2 factorial experiment (factors A and B). Assuming there is:

- a main effect of A
- a main effect of B
- there is no A by B interaction

Draw the lines for the graph. Label the lines B<sub>1</sub> and B<sub>2</sub>



**(1 point)**

A<sub>1</sub>            A<sub>2</sub>  
Factor A

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15. What is archival data?

**(1/2 point)**

What is qualitative data?

**(1/2 point)**

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16. Design a study that uses a longitudinal design to investigate smoking behavior. Be sure to include sufficient detail so that the purpose of the study is clear and that the longitudinal design is appropriate.

**(1 point)**

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17. Counter-balancing and Latin-Squares differ because:

**(1 point)**

- a. Counter-balancing will not protect against main effects
- b. A Latin Square design will not necessarily present all possible conditions in all possible orders
- c. Counter-balancing will not necessarily present all possible conditions in all possible orders
- d. In a Latin Square, all conditions are not necessarily presented equally often in every possible position

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18. An example of the problem of subject mortality (1 point)

**(1 point)**

- a. Elderly subjects in your correlational, questionnaire study continually have to be taken to the hospital and thus delays when they finish filling in the questionnaire.
- b. Some participants did not finish a cola-tasting experiment because the "lime-cherry surprise" cola tasted so awful they did not want to taste any other colas.
- c. Forcing your subjects to ruminate about their futures can be too stressful and may violate ethical principles
- d. "One-for-the-road" after a Christmas party

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19. The **threat to internal validity** that can appear if participants "know" how they "should" act based upon situational cues (and the participants choose to act in this way) is called:

(1 point)

- a. A placebo effect
- b. Experimenter bias
- c. A demand characteristic
- d. The Hawthorne effect

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20. Describe and identify one or more design problems that existed in one of the poster projects reported in class last Tuesday. **Use technical terms.** The design problem(s) must be something other than the lack of a sufficient number of participants or restricting the sample to undergraduate students. The example should be clearly described (i.e., I should recognize the project and the issue from your description). The example cannot be from your own project.

(1 point)

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21. consider:

**"relaxation training leads to decreased smoking, 33.5 cigarettes/day vs. 30.1 cigarettes/day,  $t(46)=3.75, p<.05$ ."**

- What type of analysis was performed and what was the result? (BE PRECISE)  
i.e., What does " $t(46)=3.75, p<.05$ " indicate? (BE PRECISE)

(1 point)

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22. What is a small N design and describe a situation in which one would be used. **(1 point)**

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23. Consider the following SPSS output describing the totally fictitious distribution of the gender of people in a dating service and their number of prior divorces. **Interpret** the results of the statistical test(s) and **describe** the finding(s) (or lack thereof) of the research in a manner appropriate to the way in which you would present it in a results section (you do not need to worry about the format of the headings, etc.).

**gender \* divorces Crosstabulation**

		divorces			Total	
		Never	divorced once	divorced 2+		
gender	male	Count	16	14	5	35
		Expected	21.0	8.9	5.1	35.0
	female	Count	29	5	6	40
		Expected	24.0	10.1	5.9	40.0
Total		Count	45	19	11	75
		Expected	45.0	19.0	11.0	75.0

$\chi^2(2)=7.81, p=.02$

**(1 point)**

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24. Counter-balancing procedures are designed to protect against:

**(1 point)**

- a) Interactions
- b) Main effects
- c) Order effects
- d) Simple effects

BONUS QUESTION
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25. What is a multiple baseline design?

I realize that this class requires a lot of work. The vast majority of you have risen to the challenge and it shows in your performance. Thanks for both that and the overall positive demeanor of the group that helped to make this a most enjoyable class.
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