SRM II Exam #2, Fall '04

Name: _____

Multiple Choice Choose the best alternative for each of the following questions (1 pt each).

1. The main purpose of random selection is to:

   a. increase external validity
   b. increase internal validity
   c. lower the probability of a Type 1 error
   d. lower the probability of a Type 2 error

2. The main purpose of random assignment is to:

   a. increase external validity
   b. increase internal validity
   c. lower the probability of a Type 1 error
   d. lower the probability of a Type 2 error

3. If every subject in your study experiences every possible order of conditions, it is:

   a. complete counterbalancing between subjects
   b. complete counterbalancing within subjects
   c. partial counterbalancing between subjects
   d. partial counterbalancing within subjects

4. At the beginning of the semester students in a high school are given a math test, and those that score very high on the test are placed in a class for mathematically gifted students. In an attempt to determine how much they have learned, they are given the same test again at the end of the school year. One problem with this "study" is that students might do better on the second test merely due to:

   a. practice effects
   b. regression to the mean
   c. ceiling effects
   d. all of these

5. In the example described in #4, pretest vs posttest is a ___ variable.

   a. between-subjects
   b. within-subjects
   c. confounding
   d. dependent

Questions #6 through #14 refer to the following:

A recent ABC new poll of likely votes examined the relationship between marital status and voting preference. The SPSS output of their results are on the next page:

Crosstabs

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
marital status * candidate	1573	100.0%	0	.0%	1573	100.0%

marital status * candidate Crosstabulation

Count observed value

		candidate		
		Bush	Kerry	Total
marital status	married	457	269	726
	unmarried	334	513	847
Total		791	782	1573

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	86.463[b]	1	.000		
Continuity Correction[a]	85.525	1	.000		
Likelihood Ratio	87.306	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	86.408	1	.000		
N of Valid Cases	1573				

a. Computed only for a 2x2 table

b. 0 cells (.0%) have expected count less than 5. The minimum expected count is 360.92.

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.234	.000
	Cramer's V	.234	.000
N of Valid Cases		1573	

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

6. What is the null hypothesis? (1 pt)

7. What is the alternative hypothesis? (1 pt)

8. Under the null hypothesis, how many married people would you expect to say they will vote for Kerry? (2 pts)

9. What are the degrees of freedom? (1 pt)

10. What is the appropriate χ^2 obtained? (1 pt)

11. What is the p-value? (1 pt)

12. Should the null hypothesis be rejected? Why, or why not? (2 pts)

13. What is the effect size? (1 pt)

14. Describe the observed relationship in your own words. (2 pts)

Questions #15 through #25 refer to the following study.

Dr. Hadgkins still believes his new low-fat, low-carb, low-protein diet is better than most other diets. But he has decided to take advantage of the advice you gave him on Exam #1. This time he advertises for people who want to lose weight in several different newspapers across the country. He gets 40 people to volunteer. He flies them in to Chicago, weighs them, and teaches them how to use his diet. Then he lets them go home for a month and follow his diet. After the month is over, he flies them in and weighs them again. 35 of the original 40 people stick to the diet and return to be weighed the second time. He uses SPSS to compare each person's weight before the diet to the same person's weight after the diet. The output is on the next page.

15. What is the dependent variable? (1 pt)

16. What is the independent variable? (1 pt)

17. What is the null hypothesis? (1 pt)

18. What is the alternative hypothesis? (1 pt)

19. What is the mean number of pounds lost? (1 pt)

20. What is the obtained statistic? (1 pt)

21. What is the p-value? (1 pt)

22. What would the 1-tailed p-value be? (1 pt)

23. Should the null hypothesis be rejected? Why, or why not? (2 pts)

24. What is the effect size? (3 pts)

25. Does this study actually demonstrate that Dr. Hadgkin's diet works? What are some of the most important problems with this study? What are some alternative explanations for the results? What could Dr. Hadgkins have done to make this a more convincing study? (20 pts; use a separate page for your answer)

T-Test

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	BEFORE	276.4571	35	43.0891	7.2834
	AFTER	262.6857	35	37.0356	6.2602

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	BEFORE & AFTER	35	.853	.000

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	BEFORE - AFTER	13.7714	22.4566	3.7959	6.0573	21.4855	3.628	34	.001