PSY 3330: Elementary Statistics for Behav. Sci.

Exam 3 will consist of both multiple choice questions and a few short answer questions. The MC questions will cover definitions, concepts, simple calculations, etc. Make sure and review the lecture slides to review the following definitions and concepts:

- The difference between SD for a *sample* versus a *population*

- When to use a t-test versus a z-test

- How to do the various t-tests (one-sample, paired-samples, independent samples)

- When to use an ANOVA and how to do it

- How to use various tables to find cutoff scores for hypothesis testing

- How how to compute (and the differences between) the chi-square test for goodness of fit and the chi-square test for independence.

Computational practice problems

1. A sample of freshmen takes a reading comprehension test and their scores are summarized below. If the mean for the general population on this test is $\mu = 12$, can you conclude that this sample is significantly different from the population?

$$\text{Sample scores: } 16, 8, 6, 9, 11, 13, 9, 10$$

2. The following data represent the results from a repeated-measures study comparing two treatment conditions. Do the results indicate a significant difference between the two treatments?

Participant	Treatment 1	Treatment 2
#1	8	14
#2	6	11
#3	10	10
#4	9	11
#5	7	12
#6	10	16

3. The following data were obtained from a between-subjects manipulation. Determine if there is a significant difference between the treatments.

Treatment 1	Treatment 2
5	6
1	10
2	14
3	12
4	18

4. A psychologist is examining the influence of an older sibling in the development of social skills. A sample of 24 three-year-old children is obtained. Half of these children had no siblings and the others had at least one older sibling who is within 5 years of the child's age. The psychologist records a social skills score for each child and obtained the following data. Do these data indicate that having an older sibling has a significant effect on the development of social skills?

No sibling	Older sibling
$n = 12$	$n = 12$
$M = 17$	$M = 24$
$SS = 580$	$SS = 608$

5. A researcher used an analysis of variance to compare four treatment conditions with a separate sample of $n = 9$ participants in each treatment. The results of the analysis are shown in the following ANOVA table. Fill in all the missing values of the table.

Source	SS	df	MS	F
Between				5.00
Within	96			
Total				

6. Use an analysis of variance to determine whether the following data provide evidence of any significant differences among the three treatments.

Treatment 1	Treatment 2	Treatment 3	
0	4	1	$G = 30$
2	6	0	$N = 15$
2	1	3	$\sum X^2 = 114$
0	5	1	
1	4	0	
$T = 5$	$T = 20$	$T = 5$	
$SS = 4$	$SS = 14$	$SS = 6$	

7. A new casino game involves rolling 3 dice. The winnings are directly proportional to the total number of sixes rolled. Suppose a gambler plays the game 100 times, with the following observed counts:

Number of sixes	0	1	2	3
Number of rolls	48	35	15	3

The casino becomes suspicious of the gambler and decide to perform a chi-square test to determine whether the dice are fair. What should they conclude?