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?

   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. (1) Use an analysis of variance to determine whether the following data provide evidence of any significant differences among the three treatments, and (2) perform a planned comparison to determine whether Treatment 1 differs significantly from Treatment 2

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?