Student Name: Student Number: Section Number:

PSYC 218 2017 – Lab Assignment 4
Hypothesis Testing Using the Sign Test

INSTRUCTIONS: This assignment focuses on hypothesis testing using the sign test. You should review Chapter 6 of "A Student Guide to SPSS" before trying to complete this assignment. Use the SPSS file 'Assignment 4 Data.sav' to complete the assignment. The SPSS file contains data from three CogLab experiments your class has completed (i.e., Stroop, Memory Span, and Change Detection). The data in the SPSS file represent a subset of 25 participants who completed each CogLab.

Marking of lab assignments will be very strict. If you did not complete the CogLab "Change Detection" on time, you will lose 1/4 of the total assignment grade (6 points). To avoid receiving other deductions, type your answers in the spaces provided. You may insert additional spaces after any question as needed. In addition, use proper symbols and notation (e.g., *N*, *p*) in all your answers. **All *p* values should be reported in APA style. Follow the exact guidelines on page 20 and page 41 ("Reporting the results") in your Cuttler SPSS guide.** You will lose marks for each and every failure to follow these directions.

This lab assignment is due in class on **Thursday, March 16**. You must print out your completed assignment. Do not email your assignment. You will lose 1/8 of the total assignment grade (3 points) for each day it is late. **Please follow the instructions on Connect if you are late.**

1. Conduct a sign test to analyze the Stroop data. Evaluate the non-directional hypothesis that congruency of ink colour (congruent or incongruent) affects the speed of reading colour words. [7 points]

    a. State the null and alternative hypotheses. (1 point)

    b. Report the number of subjects used in the analysis. (1 point)

    c. Report the obtained *p* value, using a 2-tailed evaluation. (1 point)

    d. Suppose you set an alpha level of .05 (2-tailed) at the beginning of the experiment. State your decision with respect to H_0 and provide a conclusion. (1.5 points)

    e. Suppose you set an alpha level of .001 (2-tailed) at the beginning of the experiment. State your decision with respect to H_0 and provide a conclusion. (1.5 points)

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f. Making reference to beta, explain why a researcher would likely *not* set the alpha level for this experiment to be .001 (2-tailed). (1 point)

2. Conduct a sign test to analyze the Memory Span data. Evaluate the directional hypothesis that memory span for letters is shorter than memory span for digits. [6.5 points]

   a. State the null and alternative hypotheses. (1 point)

   b. Report the number of subjects used in the analysis. (1 point)

   c. Report the obtained *p* value, using a 1-tailed evaluation. (1 point)

   d. Suppose you set an alpha level of .05 (1-tailed) at the beginning of the experiment. State your decision with respect to H_0 and provide a conclusion. (1.5 points)

   e. What is the probability that your decision to reject or retain H_0 in 2d represents a Type I error? Explain your answer. (2 points)

3. Conduct a sign test to analyze the Change Detection data. Evaluate the directional hypothesis that introducing a flicker increases the ability to detect a change in two nearly identical pictures. [6.5 points]

   a. State the null and alternative hypotheses. (1 point)

   b. Report the number of subjects used in the analysis. (1 point)

   c. Report the obtained *p* value, using a 1-tailed evaluation. (1 point)

   d. Suppose you set an alpha level of .05 (1-tailed) at the beginning of the experiment. State your decision with respect to H_0 and provide a conclusion. (1.5 points)

   e. There is a risk inherent in using a directional alternative hypothesis. How does the correct answer to part d show that risk? (2 points)

4. Discuss how ties are handled for the sign test. Explain why ties are handled in this manner. [2 points]

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5. What would you expect to happen to your alpha and beta levels if you were to double the sample size for your experiment? Explain your answer. [2 points]

For TA use:

Total = /24
Late Deductions (3 points for each day late) =
CogLab Deductions (6 points for failure to complete) =

Final Assignment Grade = /24