

PSYCHOLOGY 320L

Problem Set #1: Research Methods and Descriptive Statistics

Name: \_\_\_\_\_

Score: \_\_\_\_\_

1. The following story about an advertisement appeared in a weekly newsmagazine. It seems that the Pepsi-Cola Company decided that Coke's three-to-one lead in Dallas was no longer acceptable, so they commissioned a taste-preference study. The participants were chosen from Coke drinkers in the Dallas area and asked to express a preference for a glass of Coke or a glass of Pepsi. The glasses were not labeled "Coke" and "Pepsi" because of the obvious bias that might be associated with a cola's brand name. Rather, in an attempt to administer the two treatments (the two beverages) in a blind fashion, the Coke glass was simply marked with a "Q" and the Pepsi glass with an "M". Results indicated that more than half chose Pepsi over Coke.

A. What type of research is this?

B. What is the independent variable?

C. What is the dependent variable?

D. Besides a possible difference in taste, can you think of any other explanation for the observed preference of Pepsi over Coke based on the description of the study?

E. How would you redesign this study to reduce confounding--having the outcome systematically influenced by variables other than the one you are studying, in this case the taste of the cola?

2. The influence of major life changes on subsequent mental and physical health has been a source of considerable research. It started with the development of the Social Readjustment Rating Scale (below) for rating the degree of adjustment required by 46 life changes that many people experience, including both pleasant and unpleasant changes. Find all the items that apply to you over the past year (items can be repeated) and add up your total life change score. Used as a measure of the amount of stress an individual has experienced, Holmes and Rahe (1976) claim that life change scores of 300 or more are high and often precede the onset of an illness.

Score	Life Event	Score	Life Event
100	Death of Spouse	73	Divorce
65	Marital separation	63	Jail Term
63	Death of close family member	53	Personal injury or illness
50	Marriage	47	Fired at work
45	Marital reconciliation	45	Retirement
44	Change in health of family member	40	Pregnancy
39	Sex difficulties	39	Gain of a new family member
39	Business readjustment	38	Major change in financial state
37	Death of a close friend	36	Change to a different line of work
31	Securing a large loan	35	Change in # of arguments with spouse
30	Foreclosure of a mortgage or loan	29	Change in responsibilities at work
29	Son or daughter leaving home	29	Trouble with in-laws
28	Outstanding personal achievement	26	Spouse begins or ends work
26	Begin or end school	25	Change in living conditions
24	Revision of personal habits	23	Trouble with boss
20	Change in work hours or conditions	20	Change in residence
20	Change in schools	19	Change in recreation
19	Change in church activities	18	Change in social activities
17	Securing a small loan	16	Change in sleeping habits
15	Major report at school or work	15	Change in # of family gatherings
15	Change in eating habits	13	Vacation
12	Christmas	11	Minor violations of the law
10	Change in relations with a friend	8	Taking a trip for several days

A. What is your change of life score? \_\_\_\_\_

B. An operational definition describes a variable in terms of observable events that can be measurable in a study. What is Holmes and Rahe's definition of "high stress"?

C. How would you interpret your score based on Holmes and Rahe's definition?

3. The conceptual process in calculating variance is the important part of this problem. Write out all steps clearly, showing your work. Singer (1972) has done extensive studies of daydreams and their role in creativity. The beginnings of such research is to determine how much people typically daydream in some control situation. Below are representative data of the number of daydreams per hour reported by eight subjects.

Y

4

6

2

4

8

5

7

4

A. Calculate the mean.

B. Calculate the median.

C. Calculate the variance using the defining formula.

D. Calculate the Standard Deviation.

E. If you were in Singer's experiment and you daydreamed 8 times in an hour, your deviation (from the mean) would be 3. Explain in words what that 3 means.

F. Why is each deviation value squared in the calculation of variance?

4. "Readability" is a word used to identify how easy a passage of prose is to read and understand. The Cloze Technique is one way to operationally define readability, by presenting a passage with every fifth word deleted and testing to see if people can supply the missing words. Presumably, the more words the reader can supply, the more readable and understandable the passage is. On the next page are two passages from Baddeley (1982). Test their readability by filling in the blanks, then score yourself using the answers given at the beginning of problem 5, and enter your number correct on the data sheet.

A. What is the independent variable?

B. What is the dependent variable?

C. From the class's data, calculate the arithmetic mean for Passage 1.

D. From the class's data, calculate the arithmetic mean for Passage 2.

E. From the class's data, calculate the median for Passage 1.

F. From the class's data, calculate the median for Passage 2.

G. From the class's data, calculate the variance for Passage 1 using the computational method.

H. From the class's data, calculate the variance for Passage 2 using the computational method.

I. Based on the distributions and the arithmetic means, which passage would you say is more readable? Why?

J. Operationally define the idea "high readability".

Passage #1 -- wanted, red, he, plans, tried, catch, a, one, plans, thin, little, the, to, will, hen, best, picked, slung, I, red, he.
Passage #2 -- he, lost, early, begun, had, once, knowledge, books, sense, him, old, away, keep, Catherine, yielded, regret, and, on, step, moving, he, his.

5. We are going to replicate an old, time-honored study in psychology by Jenkins and Dallenbach (1924). They had students memorize a list of nonsense syllables, then followed the learning by 8 hours of sleep or 8 hours of waking activity, and finally tested the students to see how much of the original learning was retained. They found that far less forgetting occurred after sleep than after waking activity.

Here's how we will replicate the study:

- Memorize the appropriate list until you can rewrite it twice in a row correctly from memory in the correct serial order.
- Follow the memorization with the appropriate activity for 8 hours.
- Test for retention at the end of 8 hours and enter your score on the data sheet.

AWAKE LIST

jev bof rel dih  
nir res leh vol  
kah fah wol ruw

SLEEP LIST

hac cim giz mur  
tuv jof saf toj  
zus peb bav ciz

A. A research hypothesis is a statement of how you expect the study to turn out. Based on Jenkins and Dallenbach's results of 70 years ago, what is our research hypothesis?

B. Calculate the mean for number of words recalled after eight hours awake and the mean for number of words recalled after eight hours asleep.

C. Calculate the variance for the awake group using the defining method and the variance for the asleep group using the computational method.

D. Calculate the standard deviations for both groups.

E. Is the hypothesis supported--does there seem to be a difference in retention after sleep and after waking activity?

F. What are the independent and dependent variables in this study?

G. What variables could confound our results?

6. Continuing to think about Singer's (1972) research on daydreaming, which was discussed in problem 3, here are data on 75 students from a Psychology 150 class. Using a self-timing procedure, they measured the length of a daydream in minutes.

6	8	11	4	7	3	5	9	6	2	6	4	8
6	7	6	5	7	9	3	1	4	10	6	3	7
3	6	4	12	3	7	6	6	8	11	2	9	5
6	4	4	6	6	8	5	3	11	7	5	9	
14	6	6	11	4	2	9	8	8	8	5	5	
5	5	4	5	9	7	5	5	7	8	10	10	

A. Use SPSS (a computer statistics program) to find the following statistics:

mean =

median =

variance =

standard deviation =

B. Draw an ungrouped bar graph of daydream length. Be sure to label the axes clearly.

C. To see how the mean and SD are a good summary of the distribution, mark on your graph the mean and  $\pm 1$  and  $\pm 2$  standard deviations.

## Data Sheet

Problem #4: Cloze Technique score: Passage 1 \_\_\_\_\_

Passage 2 \_\_\_\_\_

Problem #5: Recall after 8 hours asleep \_\_\_\_\_

Recall after 8 hours awake \_\_\_\_\_

### Passage #1

The sly young fox \_\_\_\_\_ to eat the little \_\_\_\_\_ hen for his dinner. \_\_\_\_\_ made all sorts of \_\_\_\_\_ to catch her. He \_\_\_\_\_ many times to \_\_\_\_\_ her. But she was \_\_\_\_\_ clever little hen. Not \_\_\_\_\_ of the sly fox's \_\_\_\_\_ worked. He grew quite \_\_\_\_\_ trying to catch the \_\_\_\_\_ red hen. One day \_\_\_\_\_ sly young fox said \_\_\_\_\_ his mother, "Today I \_\_\_\_\_ catch the little red \_\_\_\_\_ . I have made the \_\_\_\_\_ plan of all." He \_\_\_\_\_ up a bag and \_\_\_\_\_ it over his back. " \_\_\_\_\_ shall put the little \_\_\_\_\_ hen in this bag," \_\_\_\_\_ said to his mother.

### Passage #2

In the first place, \_\_\_\_\_ had by that time, \_\_\_\_\_ the benefit of his \_\_\_\_\_ education: continual hard work, \_\_\_\_\_ soon and concluded late, \_\_\_\_\_ extinguished any curiosity he \_\_\_\_\_ possessed in pursuit of \_\_\_\_\_, and any love for \_\_\_\_\_ or learning. His childhood's \_\_\_\_\_ of superiority, instilled into \_\_\_\_\_ by the favors of \_\_\_\_\_ Mr. Earnshaw, was faded \_\_\_\_\_. He struggled long to \_\_\_\_\_ up an equality with \_\_\_\_\_ in her studies, and \_\_\_\_\_ with a poignant though silent \_\_\_\_\_, but he yielded completely; \_\_\_\_\_ there was no prevailing \_\_\_\_\_ him to take a \_\_\_\_\_ in the way of \_\_\_\_\_ upward, when he found \_\_\_\_\_ must, necessarily, sink beneath \_\_\_\_\_ former level.