Lab #3

OF WINDSOR 02-02-250 BASIC QUANTITATIVE METHODS Assignment #3

Introduction to Hypothesis Testing ID Lab section/instructor

Date

Exercise Questions

1. For the Number of hours watching television—" tvhours" variable, run the appropriate statistics and visual representation and assess the distribution. (2 marks)

a) Briefly interpret the results for the " tvhours" variable. Are people watching a lot of TV?

The average number of hours per day that respondents (whole population) watch television is about 2. 9 hours (SD = 2. 24). About half of the respondents watch television up to 2 hours per day. About 50% of the respondents watch television in between 2 to 4 hours per day. Most of the respondents watch television 2 hours per day. The range of the number of hours watching television by respondents is 24 hours per day with minimum being 0 hours per day and maximum being 24 hours per day (may be an error in data!). Watching television less than 3 hours per day, in my opinion is not a lot. Therefore, people are not watching a lot of TV.

b) Is the distribution skewed? If so, in which direction? Why/Why not? Please explain your answer(s)

Respondents mean number of hours watching television per day is greater than the median number of hours watching television per day that suggest positive skewness (right skewed). As can be seen in figure 1, the distribution of number of hours watching television per day is skewed to right (the long

tail of histogram point's right). This visual skewness is also supported by coefficient of skewness, which is 2. 82.

2. Complete a " Select Cases" function in SPSS to obtain a sample from the overall population (entire data-set). Using the " degree" variable, select cases so you are taking the part of the dataset that reported having less than High School as their response. After completing the function, re-run the appropriate statistics and visual representation for the " tvhours" variable and answer the following questions (3 Marks)

a) Briefly interpret the results for the " tvhours" variable for the selected cases Are people watching a lot of TV still? Or has it changed?

The average number of hours per day that respondents with less than High School watch television is about 3. 93 hours (SD = 2. 82). About half of the respondents with less than High School watch television up to 3. 5 hours per day. About 50% of the respondents with less than High School watch television in between 2 to 5 hours per day. Most of the respondents with less than High School watch television 2 hours per day. The range of the number of hours watching television by respondents with less than High School is 24 hours per day with minimum being 0 hours per day and maximum being 24 hours per day (may be an error in data!). Watching television greater than 3 hours per day, in my opinion is a lot. Therefore, respondents with less than High School are watching a lot of TV.

b) Is the distribution skewed? If so, in which direction? Why/Why not? Please explain your answer(s)

The mean number of hours watching television per day for respondents with less than High School is greater than the median number of hours watching television per day that suggest positive skewness (right skewed). As can be

seen in figure 2, the distribution of number of hours watching television per day for respondents with less than High School is skewed to right (the long tail of histogram point's right). This visual skewness is also supported by coefficient of skewness, which is 2. 95.

3. This section will involve hypothesis testing. Please answer the following questions.

a) Begin the hypothesis test by first commenting on any difference between the Sample Mean of respondents with less than high school and the number of " tvhours" and the entire Population Mean. Is there a difference at first glance? (2 marks)

There is a difference of about one hour per day in watching television between the respondents with less than high school and the entire population. Therefore, there is a difference at first glance.

b) Propose a research question for the hypothesis test. Next, outline a null and alternative hypothesis as discussed in class to test if the sample mean is from the population or significantly different. (6 marks)

The research question is " Are people with less than high school watching television (number of hours per day) differently as compared to whole population?"

The null and alternate hypotheses are

H0: $\mu = 2.90 (\mu_0 = 2.90)$

(People with less than high school are not watching television differently.)

H1: $\mu \neq 2.90$

(People with less than high school are watching television differently.)

c) To see if this difference is significant, calculate the observed Z-Score comparing these two means and interpret its value in relation to the critical

value according to a 95% confidence level. Interpret your results. Meaning,

explain why it would be significant verses not significant or vice versa. (12

marks)

$\mu_0 = 2.90$, $\sigma = 2.238$, = 3.93, $n = 276$

== 7.646

The critical value according to a 95% confidence level is ± 1.960.

The decision rule is

Reject H0 if $z > 1.960$ or $z < -1.960$. Otherwise, do not reject H0.

Since, the test statistic (z) value of 7.646 is greater than critical value of $+1.$

960. Therefore, reject H0 and conclude H1.

In conclusion, people with less than high school are watching television

(number of hours per day) differently as compared to whole population.

Table 1

Descriptive Statistics: the Number of hours watching TV per day (tvhours

variable)

N

Valid

1489

Missing

11

Mean

2. 90

Median

2. 00

Mode

2

Std. Deviation

2. 238

Skewness

2. 818

Std. Error of Skewness

. 063

Range

24

Minimum

0

Maximum

24

Percentiles

25

2. 00

75

4. 00

Figure 1: Distribution of the Number of hours watching TV per day

Table 2

Descriptive Statistics: the Number of hours watching TV per day for less than

HS (degree)

N

Valid

276

Missing

3

Mean

3. 93

Median

3. 50

Mode

2

Std. Deviation

2. 820

Skewness

2. 947

Std. Error of Skewness

. 147

Range

24

Minimum

0

Maximum

24

Percentiles

25

2. 00

75

5. 00

Figure 2: Distribution of the Number of hours watching TV per day for less

than HS

5. 00