Influence of Gender on Travel Preferences among City U Students

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This statistic project deals with the travelling experience of the students of the City University of Seattle located in Bratislava. The students are often experienced travelers since a good command of English is a must at the university. This project compares the traveling experiences of male and female students and will provide the statistical evidence for hypothesis question if the proportion of male City University students travelling outside of Europe is significantly different from the proportion of female City University students.

This information could be valuable for various agencies specializing in tourism and staying abroad as well as for the City University itself. In the first place, the travel and work agencies could use this information for their promotion programs by being knowledgeable about the gender preferences for travelling. City University could apply this information for promotion of the student mobility programs.

To gain the information about the City University students travel experiences we created a questionnaire in which we were focusing on the stay abroad, during the year 2010. We asked about destinations outside of Europe since we did not want to obscure the data with short travel within Europe. The questionnaire is attached in the Appendix 1. We have collected a sample by asking City University students on the social network Facebook. Thirty respondents of each gender answered the questionnaire. Appendix 2 contains the summary of the collected data. Number 1 represents confirmation of the stay outside of Europe, while number 0 stands for not travelling outside of Europe.

The sample data does not truly represent the population of City University students since the voluntary response bias is present. The sample was collected by sending messages to students on the social network Facebook. However, not every individual responded and filled out the questionnaire.

Moreover, since we restricted the question to out of Europe travel, we automatically excluded those who travelled often, but only within Europe. Therefore, our results could be skewed towards one gender.

The sample collected is random, because we suppose that nearly all students have a profile on Facebook nowadays.

Descriptive statistics for sample of male students is attached in Appendix 3 and for female students in Appendix 4. The sample mean provides the information on proportion of male and female students who were outside of Europe in year 2010. The proportion of male students is 0,4667 while the proportion of female students is 0,3333 so we can conclude that 46,67% of male and 33,33% of female students from our sample travelled outside of Europe in year 2010. Since we deal with the binominal random variable, the median and mode are in both cases 0, as the number of students who did not travel outside of Europe was greater than the number of those who travelled. This is confirmed by the sum and count, as the sum number is less than half of the count (male students: 14 out of 30 and female students: 10 out of 30). Deviation from the mean is described by the standard deviation, which is in case of male 0.5074 and in case of female 0.4795.

Frequency distribution table (Appendix 5) for sample proportion would have only two bins, representing those students who travelled outside of Europe and those who did not travel. Histogram is not appropriate graph for this kind of distribution.

To estimate out the unknown population proportion, specifically the proportion of all male and all female City University students who stayed outside of Europe in year 2010 we have chosen to construct an interval with the level of confidence of 95%. For this operation it is necessary to calculate the margin of error. The calculations can be found in Appendix 6. The margin of error for male students is 0,1785. The calculations show that with the 95% confidence level, the proportion of all male students who travelled outside of Europe in year 2010 is between 28,82% and 64,52%. The calculations of the confidence interval for female population of City University are attached in Appendix 6. The margin of error is calculated to be 0,1687. We can conclude that with 95% confidence level, the proportion of all female students who stayed outside of Europe in 2010 is in the interval from 16,46% to 50,20%.

To test whether the proportions of male and female students travelling outside of Europe in 2010 are different we have created two competing statements. The null hypothesis is $H_0: \pi_1 = \pi_2$ saying that both male and female proportions are the same. The alternative hypothesis is $H_A: \pi_1 \neq \pi_2$ saying the male and female proportions are significantly different. All the calculations are in Appendix 8. Using the sample proportions of male and female students travelling outside of Europe in 2010 we calculated p_c, which is the sample proportion of both samples. This proportion is further used in calculation of z statistics, which resulted in 1,0546. P-value is calculated to be 0,2916 what is 29,16%.

At α = 5% we do not reject the H_0 hypothesis and conclude that there is not sufficient evidence to claim that the proportion of male City University students travelling outside of Europe is significantly different from the proportion of female City University students, so there is no gender difference in travelling outside of Europe. Increasing significance level to 10% does not influence the conclusion because the p-value is still higher.

This statistical report refuted the claim that there is a significant difference between genders in travelling outside of Europe. Male and female students of City University travel equally outside of Europe.

Reference

Experiment Resources.Com. (n.d.). *Research Bias*. Retrieved March 11, 2011 from http://www.experiment-resources.com/research-bias.html

Appendices

Appendix 1

State if you are male or female. Male/Female

Did you travel outside of Europe in year 2010? Yes/No

Appendix 2

Male	
1	0
0	0
1	0
1	0
1	0
1	0
0	1
1	1
0	1
0	0
0	1
0	1
0	1
1	0
0	1

Female	
1	0
0	1
0	1
0	0
1	0
0	0
0	0
0	0
0	1
1	1
0	1
0	0
0	0
0	1
0	1

Appendix 3

Descriptive Statistics - Male	
Mean	0.466666667
Median	0
Mode	0
Standard Deviation	0.507416263
Sample Variance	0.257471264
Kurtosis	-2.12691326
Skewness	0.14076918
Range	1
Minimum	0
Maximum	1
Sum	14
Count	30

Appendix 4

Descriptive Statistics - Female	
Mean	0.333333333
Median	0
Mode	0
Standard Deviation	0.479463301
Sample Variance	0.229885057
Kurtosis	-1.55357142
Skewness	0.744880486
Range	1
Minimum	0
Maximum	1
Sum	10
Count	30

Appendix 5

Male	Frequency	Cumulative Frequency
Stayed outside of Europe	14	14
Did not stay outside of Europe	16	30

Female	Frequency	Cumulative Frequency
Stayed outside of Europe	10	10
Did not stay outside of Europe	20	30

Appendix 6

Margin of error with 95% level of confidence for male population of City University:

$$me = z_{\alpha/2} \times \sqrt{\frac{p \times (1-p)}{n}} = NORMSINV(0.975) \times \sqrt{\frac{0.4667 \times (1-0.4667)}{30}} = 0.1785$$

Confidence Interval:

Proportion - margin of error = lower bound

$$0{,}4667 - 0{,}1785 = 0{,}2882 \rightarrow 28{,}82\%$$

Proportion + margin of error = upper bound

$$0{,}4667 + 0{,}1785 = 0{,}6452 \rightarrow 64{,}52\%$$

Appendix 7

Margin of error with 95% level of confidence for female population of City University:

$$me = z_{\alpha/2} \times \sqrt{\frac{p \times (1-p)}{n}} = NORMSINV(0.975) \times \sqrt{\frac{0{,}3333 \times (1 - 0{,}3333)}{30}} = 0.1687$$

Confidence interval:

Proportion – margin of error = lower bound

$$0{,}3333 - 0{,}1687 = 0{,}1646 \rightarrow 16{,}46\ \%$$

Proportion + margin of error = upper bound

$$0{,}3333 + 0{,}1687 = 0{,}5020 \rightarrow 50{,}20\ \%$$

Appendix 8

Hypothesis testing – two tail test

H_0: $\pi_1 = \pi_2$

H_A: $\pi_1 \neq \pi_2$

π_1- Proportion of male City University students who travelled outside of Europe in the year 2010

π_2– Proportion of female City University students who travelled outside of Europe in the year 2010

$$p_1 = \frac{x_1}{n_1} = \frac{14}{30} = 0{,}4667$$

$$p_2 = \frac{x_2}{n_2} = \frac{10}{30} = 0{,}3333$$

$$p_c = \frac{x_1 + x_2}{n_1 + n_2} = \frac{14 + 10}{30 + 30} = \frac{24}{60} = 0{,}4$$

$$z = \frac{p_1 - p_2}{\sqrt{p_c(1 - p_c)\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}} = \frac{0{,}4667 - 0{,}3333}{\sqrt{0{,}4(1 - 0{,}4)(\frac{1}{30} + \frac{1}{30})}} = 1{,}0546$$

$$p - value = 2 * (1 - NORMSDIST(1{,}0546)) = 0{,}2916 \rightarrow 29{,}16\%$$

$\alpha = 0{,}05 \rightarrow 5\%$

$p - value > \alpha$

$29{,}16\% > 5\%$