

# A Survey Study on Major Changes of Columbia College Students

By Sammy Page and Brandi Kleier

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## **Introduction:**

The purpose of this project was to find the proportion of both male and female students attending Columbia College that have changed their majors and compare them in order to determine if there is a difference in the likelihood of major changes based on gender.

To answer this question we took a simple random sample of students taking classes on campus through a survey offered around the college (outside both the Manzanita Building and the Tamarack Hall) from Monday through Thursday 9 a.m. until 12 p.m. and from 3 p.m. until 4:30 p.m. on Tuesdays and Wednesday. The data received from the surveys were then catalogued according to the specific answers given and compared amongst the different characterizations in the questions.

## **Definitions and Assumptions:**

We defined our population as the students taking classes on campus that were present at the time that the surveys were being administered. We assumed that an ample representative population of the student body would travel past either the Manzanita Building or the Tamarack Hall giving us sufficient cause to generalize our results to the whole population of Columbia College students. Our assumptions also included:

1. The times that were made available for the students to take the survey would allow a random sample to be taken because it would not exclude the students who attended classes earlier in the day nor the students who attended classes later in the day.
2. The wording of the questions would not deter either gender or include any biases that would disrupt our SRS.
3. The participants of the survey would answer truthfully for there would be no incentive to lie about a major change.
4. Participants would not take the survey more than once because there was no payoff given thus minimizing incentive.
5. The statistic associated with gender would be the sex that they identify as and not necessarily the original gender at birth.

Our initial hypothesis, from our personal experience, was that the true proportion of men and women switching their major within the first two years is equal.

### **Sampling Design and Methodology:**

The first step in gathering the data was, first, generating a survey that would give reason and help find the probability in initial major changes from both men and women Columbia College students. Following the creation of this survey, we chose to administer it outside both the Manzanita Building and the Tamarack Hall from Monday through Thursday 9 a.m. until 12 p.m. On Tuesdays and Wednesdays, the surveys were available from 3 p.m. until 4:30 p.m. We recieved

211 surveys to calculate our data from. After gathering the data, we compiled and analyzed them according to the questions asked. To answer our thesis question, we used a 2-proportion z-test for the number of males and females that have changed their major. To calculate the data we chose to use a TI-84 calculator. Assuming that the null hypothesis of no difference in proportions between male and female is true, we got a P-Score of 0.211 which was not significant enough to reject the null hypothesis. To test the significance, we used an alpha of 0.05.

### **Problems We Faced:**

The problems we faced were not were not overly significant and did not disrupt the answer of our thesis question. A problem that did occur was that we had to collect data longer than we had originally anticipated because we did not get enough surveys by the time that we expected to. Another problem that we faced was finding a way to hand out the surveys while we both were in class. Because we both had other classes to attend while the surveys were supposed to be administered, we had to rely on friends such as Cody Henderson and Colter Bassi to facilitate the survey while we were gone. Lastly, we did not receive enough answers to compile data referring to the final question on the survey regarding proportions and probability of which major is most likely transferred out of.

### **Results:**

Because our data is from a survey we were unable to assign a number value which confined our data to strictly proportions. To compute our statistic we used a TI-84 calculator. To answer our thesis question, we used a 2-proportion z-test for

the number of males and females that have changed their major. To calculate the data we chose to use a TI-84 calculator. Assuming that the null hypothesis of no difference in proportions between male and female is true, we got a P-Score of 0.211 which was not significant enough to reject the null hypothesis. To test the significance, we used an alpha of 0.05.. Further, we concluded that this data indicates no difference between the proportion of major changes between men and women thus proving our hypothesis correct. As for whether there is a difference in proportions between the likelihood of male students and female students changing their major once as compared to two or more times, we chose to compute using a 2-proportion Z-Test. We began by comparing the proportions between the females students and the male students that changed their major only once. Using our TI-84 calculators, we found a Z-Score of 0.5596 and a P-Value of 0.153, thus not providing significant evidence to reject the null hypothesis of no difference in proportions between male and female students students who had only changed their major once. Secondly, we also proceeded to use a 2-proportion Z-Test to compare the proportions of male students and female students who had changed their major two or more times. Using our TI-84 calculators, we received a Z-Score of -1.48 and a P-Score of 0.0694 which was not significant evidence to reject the null hypothesis of no difference regarding the proportion of male students and female students who had changed their major two or more times.

### **Discussion:**

The data received showed no difference between the proportion of male and female Columbia College students changing their major during their first two years

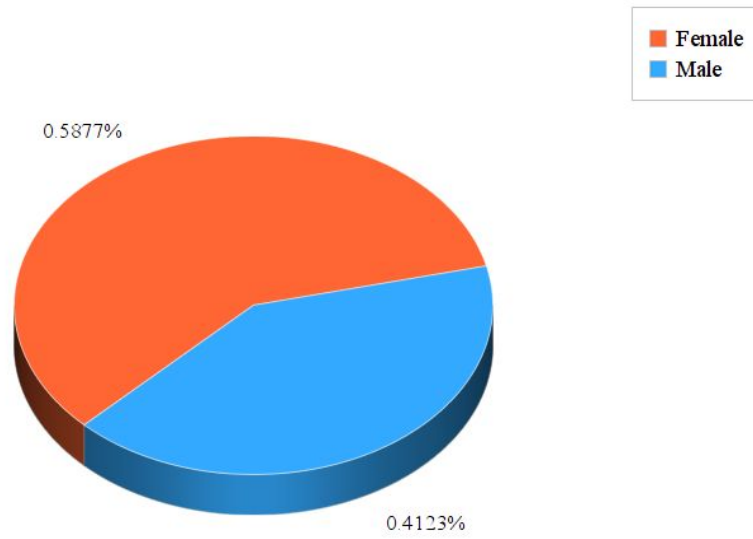
attending classes but to further prove that hypothesis, more data could be collected. Also, if the Counseling department allowed us to compare our data with the data on the school's server we could determine the significance of our statistic.

**Conclusion:**

The data that was collected indicated that there is no difference between the true proportions of male and female Columbia College students changing their major within the first two years of taking classes. Further, no difference between the proportions of male and female students who had changed their majors more than two times was indicated by the data. The data collected proved our original hypothesis but the true statistic could be found if the data from the college's counseling department was available to compute.

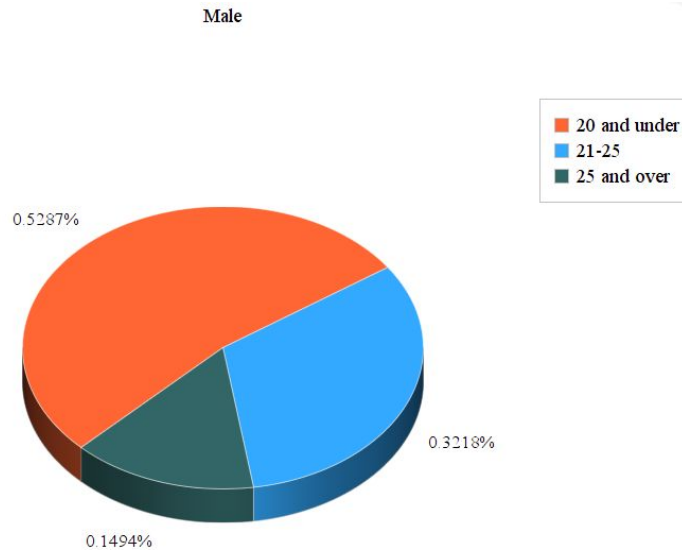
**Gender?:**

Gender

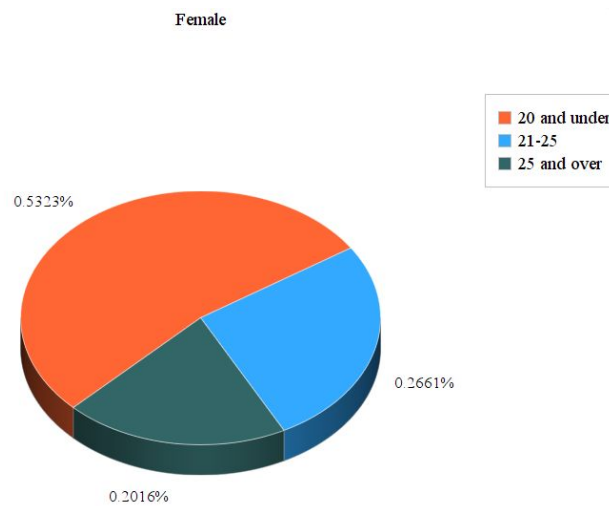


**The two proportions of major changes between men and women.**

**Age?:**



**The differences in proportions of men within the three age groups.**

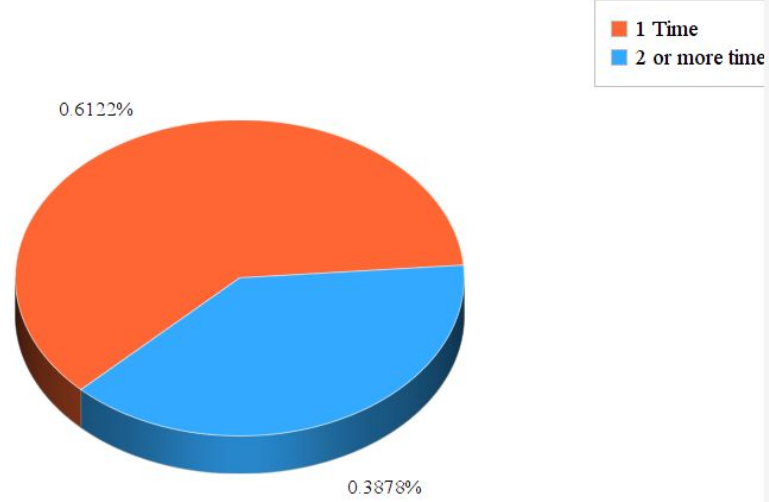


**The differences in proportions of women within the three age groups.**

**Switched Major?:**

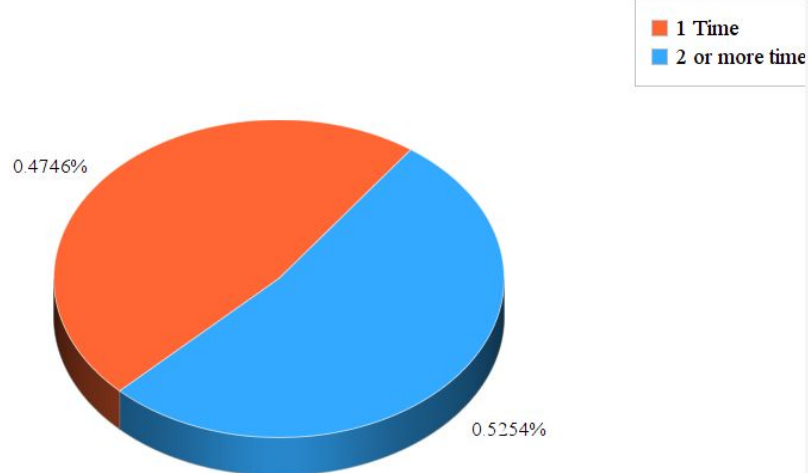


Switched Major: Male



**The two proportion of men who changed their major once compared to two or more times.**

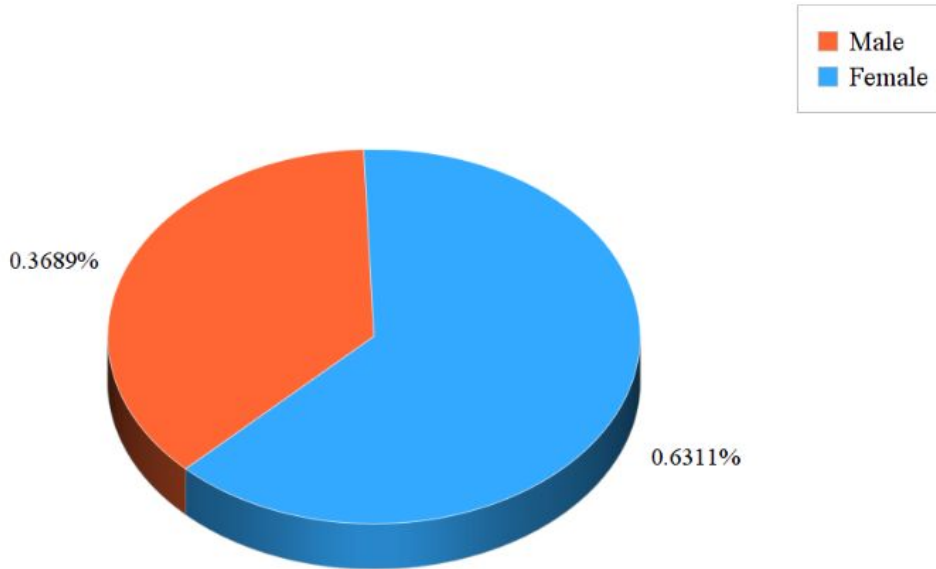
Switched Major: Female



**The two proportion of women who changed their major once compared to two or more times.**

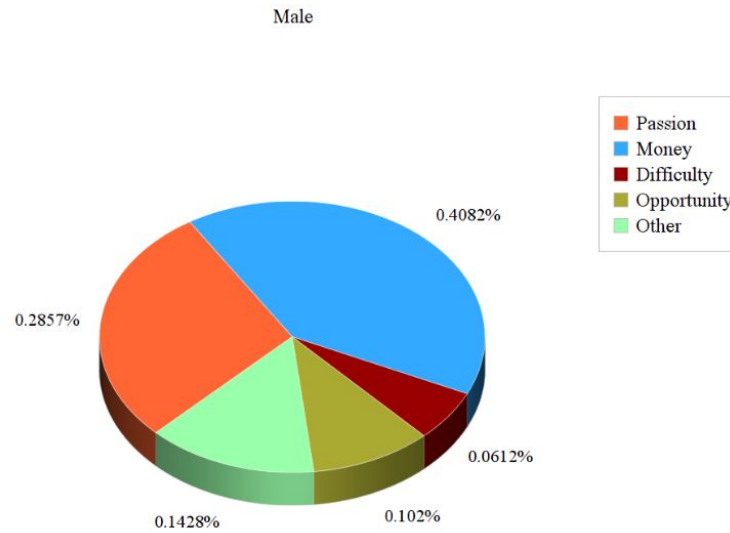
**Didn't Switch Major?:**

Didn't Switch Major

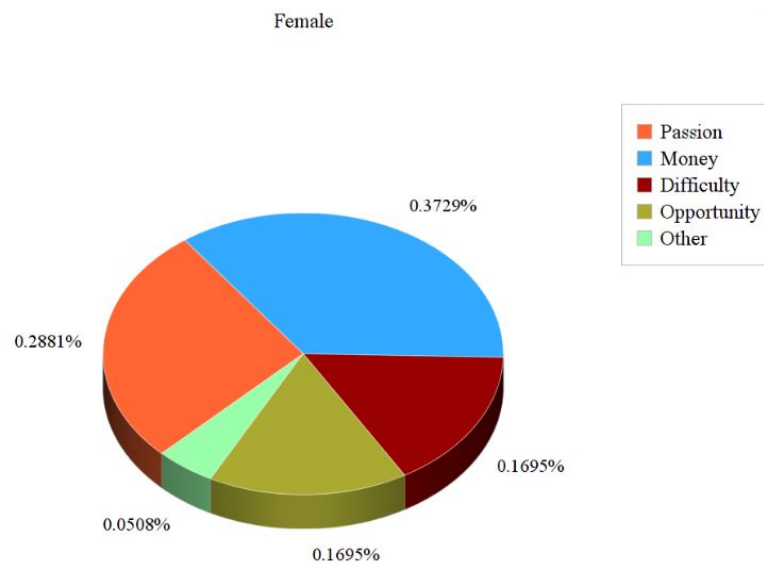


**The two proportions of men and women who did not switch their major.**

**Reason For Switching?:**



**The difference in proportion of reasons cited for switching their majors for the male group.**



**The difference in proportion of reasons cited for switching their majors for the female group.**