

Public Library Research Project

University of North Texas

INFO 5080

April 26, 2021

Work Team 3

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Letter to the Director

March 1, 2021

Mary Hatch, Branch Manager
Blue Springs Public Library
1122 Not A Real Street
Blue Springs, TX 76209

Mary:

Thank you for taking the time to read and consider our proposal. We are a research team affiliated with the University of North Texas, Library and Information Sciences Graduate Program. We are contacting you in hopes that we may make use of your library facility to conduct some research.

The mayor of Blue Springs has asked our team to investigate whether the users of your library reflect the population of the community which the library is intended to serve. To ascertain this information, we propose placing a small group of observers into your library common areas — no more than 2-4 people. These observers will have no need to interact with library patrons and are only there to ascertain the gender of the patrons by conducting periodical counts. This observation process will only take a couple of hours a day over three days, and we will not interfere with library procedures.

It is our hope that you approve the use of your facility for our study and that we will hear from you shortly. We will gladly provide you with all the data which the research team collects. And, again, we thank you for your time and consideration.

UNT MILS Research Team 3.

Crystal Lewis
Faith Garrett
Joanna Russell Bliss
Rachel Gooding
Travis Kimpler

Letter to Director Conveying Results of Data Collected

April 1, 2021

Mary Hatch, Branch Manager
Blue Springs Public Library
1122 Not A Real Street
Blue Springs, TX 76209

Mary:

Thank you again for allowing us to observe your library and to gather data on your patrons. Blue Springs Public Library is a central part of our community, and being able to study its population and compare it to our population at large will help the mayor and our city council continue to discuss its funding and role within our fair city.

We observed your patrons and noted their gender as they entered the library for about two hours on each observation day, a Thursday, Friday and Saturday in mid-March, making sure to collect at different times on each day – during the evening on Thursday, in the morning on Friday, and mid-afternoon on Saturday. We chose these dates and times to ensure a randomized sample was collected, and we sat by the reference desk as we collected this data. After our observations, we had a total of 418 patrons that visited the library during these days and times: 265 women and 153 men.

Once we had collected this data, we needed to compare our observations to the latest data we had on the population in general. The most recent census, collected in 2010, shows that Blue Springs has a population of 52,500 people, which can be further shown to reflect a population that includes 25,988 men (49.5%) and 26,512 women (50.5%).

We operated with the expectation of a null hypothesis, that there is no difference in the proportion by gender of the public library users at Blue Springs Public Library as compared to the proportion by gender of the population in Blue Springs as a whole. If this were true, we would expect 50.5% of 418 (211) of the sample library users to be female and 49.5% of 418 (207) of the sample library users to be male. However, the sample contained 54 more women and 54 fewer men than would be expected if the null hypothesis were true. It appeared as if the library users do not reflect the population in the city of Blue Springs as a whole by gender.

To test this with a statistical tool, we used the Chi Square Goodness of Fit. After our calculations, which you can see in the attached pages, our Chi Square statistic was 27.4 with a probability value of less than 0.0001. This led us to conclude that we are at least 95 % sure that if we took another sample of the patrons at Blue Springs Public Library, there would be a difference between the proportion by gender of the patrons at Blue Springs Public Library as compared to the proportion by gender of the population in Blue Springs as a whole.

There are always possible errors with these types of estimations. While unaware of any such events, any gender-skewed library user groups who made use of the library during the hours of observation, or any gender-skewed social events which were held in the nearby vicinity of the library, could result in additional patrons of a particular gender during the hours of observation and could negate our results.

Duplicating the observations at a later time, on other days of the week and/or at different times could help to either confirm the results that we found, or determine that there were such errors and that, in fact, the proportions of library patrons by gender do represent the population of Blue Springs as a whole.

Thank you again for the access to your library, and the kindnesses that you showed us while we were observing your patrons. Please let us know if there is anything else we can send you about our study.

Sincerely,

UNT MILS Research Team 3.

Crystal Lewis
Travis Kimpler
Rachel Gooding
Faith Garrett
Joanna Russell Bliss

Population and Sample

The latest census of Blue Springs reflects a gender distribution of 50.5% females and 49.5% males. With the purpose of this study being to show which part of the population utilized the library, it was important to analyze the correlation between the number of male and female patrons. There was a total of 418 patrons during our data collection, which were comprised of 265 (50.5%) females and 153 (49.5%) males. See Appendix A for the complete spreadsheet of data collected.

Observation Area(s) and Time(s)

Over the span of three days (Thursday, Friday, and Saturday), the research team counted the patrons as they entered the library for about two hours each day. The days and times for the study's observation data were chosen to ensure a randomized sample was created, establishing impartial results when conducting the observations.

That said, the area where the observations took place remained constant. The area chosen was the reference desk. The reference desk is where an information professional provides library users their expertise on a variety of topics. Observing this area provided a better understanding on which gender utilizes library resources the most.

Creating and Testing a Hypothesis

Research Question

Does the proportion by gender of the public library users at Blue Springs Public Library differ from the proportion by gender of the population in Blue Springs as a whole?

Null Hypothesis Based on Research Question

There is no difference in the proportion by gender of the public library users at Blue Springs Public Library as compared to the proportion by gender of the population in Blue Springs as a whole.

Data Gathered and Descriptive Statistics

Females make up 50.5% of the population and males make up 49.5% of the population of the city of Blue Springs. We took a random sampling of 418 visitors to the Blue Springs Public Library, counting the number of visitors for about two hours each day on three separate days, noting those visitors' genders.

If library users were in the same proportion by gender as the population of Blue Springs, we would expect 50.5% of 418 ($211.09 = 211$) of the sample library users to be female. Based on our observation of the sample, 265 users were female. We would also expect that 49.5% of 418 ($206.91 = 207$) of the sample library users to be male. Based on our observation of the sample, 153 users were male.

Our Prediction of Whether Our Sample Is Representative of the Population

The sample contained 54 more females and 54 fewer males than would be expected if the null hypothesis were true. It appears as if the library users do not reflect the population in the city of Blue Springs as a whole by gender.

Probability Level

We will use .05 as our probability level because we want to be at least 95% sure of our findings.

Inferential Statistical Tool

We chose Chi Square Goodness of Fit because we are dealing with one nominal level variable, which is gender, and we want to know if our sample of 418 matches the population of library users.

Our Calculations and Probability Value

Female	Male
O = 265	O = 153
E = 211	E = 207

Chi Square Statistic = 27.4

p (probability value) = < 0.0001

Concluding Statement

We are at least 95 % sure that if we took another sample of the patrons at Blue Springs Public Library, there would be a difference between the proportion by gender of the patrons at Blue Springs Public Library as compared to the proportion by gender of the population in Blue Springs as a whole.

Potential Errors in Research

There are multiple potential errors which should be avoided while testing the null hypothesis. These potential errors could lead to a misrepresentation or skewing of the data and should be considered while arranging, conducting, and analyzing the observation research.

Type I errors are the result of a situation in which researchers reject the null hypothesis when it should not have been rejected. Potential Type I errors which should be considered while arranging and conducting the research are:

- Any gender-skewed library user groups who make use of the observation area during the hours of observation. Also,
- Any gender-skewed social events which are being held in the nearby vicinity of the library, which could result in additional patrons during the hours of observation.

Type II errors happen when researchers fail to reject the null hypothesis when it should have been. These types of errors can also be the results of threats to the study's internal validity. Potential Type II errors would be:

- If the research team investigated the education level of the patrons on top of their gender.
- If the research team conducted observations on multiple days, spaced out several days apart.
- If the research team notifies the community that the observations are being performed.

For the purpose of obtaining reliable and factual data, the research team should make an effort to identify and avoid any potential or related errors which could result in the observation and data collection process.

Appendix A: Data Observed at Blue Springs Public Library

Blue Springs Public Library Observation Data		
<i>Observation 1: March 18th, 2021 – 6:30-8:30pm</i>		
Time	Female	Male
6:30pm	8	1
6:40pm	3	4
6:50pm	2	6
7:00pm	9	4
7:10pm	5	3
7:20pm	4	0
7:30pm	5	5
7:40pm	2	4
7:50pm	1	3
8:00pm	3	7
8:10pm	5	4
8:20pm	3	6
8:30pm	4	3
Total	54	50
Total # of Females + Males = 104		
<i>Observation 2: March 19th, 2021 – 11:00am-1:00pm</i>		
Time	Female	Male
11:00am	8	6
11:10am	6	2
11:20am	2	0
11:30am	19	9
11:40am	2	1
11:50am	2	3
12:00pm	5	7
12:10pm	4	2
12:20pm	3	2
12:30pm	4	3
12:40pm	5	0
12:50pm	0	5
1:00pm	16	11
Total	76	51
Total # of Females + Males = 127		
<i>Observation 3: March 20th, 2021 – 1:30-3:30pm</i>		
Time	Female	Male
1:30pm	20	6
1:40pm	17	3
1:50pm	15	6
2:00pm	11	9
2:10pm	5	3

2:20pm	6	4
2:30pm	17	6
2:40pm	14	2
2:50pm	7	0
3:00pm	12	6
3:10pm	4	2
3:20pm	3	0
3:30pm	4	5
Total	135	52
Total # of Females + Males = 187		

Total Count Over 3 Days:

- Total # of Females = 265
- Total # of Males = 153
- Total # of Females + Males = 418

Appendix B: Task Assignments for Group Project

Letter to the director asking about project; Analysis for Type I or Type II errors: Travis Kimpler

Population/sample; Observation area(s) and time(s): Crystal Lewis

Steps in Hypothesis Testing Sheet addressed: Rachel Gooding & Faith Garrett (all group members discussed what test should be used when completing the Hypothesis Testing Sheet)

Communication of project results to Director; Formatting/editing of paper: Joanna Russell Bliss