The Relationship between Gender and Animal Preference

 For this problem, I chose the factors of gender and animal preference. There are several types of people who prefer cats, dogs, both, and neither. I am interested to find out if there is any correlation between gender and this type of preference.

 From the data given, I determined the test I needed to do was the x2 test or chi-square test. I am testing for two factors and whether the factors have a relationship. The null hypothesis is that there is no relationship between gender and animal preference. The alternative hypothesis is that there is a relationship between gender and animal preference. The parameters are the row and column factors from the two-way table below. The row factor is gender (male or female), and the column factor is animal preference (dog, cat, both, neither). Next, I determined if I could run the test for step three of the hypothesis test. The sample is a simple random sample and all the expected counts are all at least five. I calculated the expected counts through subtracting the total row number from the column number then dividing by the total number. The expected count table is referenced at the end of the paper.

 For the fourth step, I used the significance level of 0.01 because it is a small sample size of 120. I also included the observed and expected counts into a table or matrix on the calculator to run the test. The observed counts are in the two-way table. After that, I ran the x2 test or the fifth step. The x2 is 3.0031 and the p-value is 0.3911. In addition, the degrees of freedom or df, is 3. The p-value shows that there is no relationship because it is greater than the significance level of 0.05.

 The final sixth step of the hypothesis test is the conclusion. There is no significant evidence that there is a relationship between gender and animal preference. However, the group that contributed most to the test-statistic was males and an animal preference of both. This group had a significantly higher x2 value than the other groups at 0.7681.

 After going through the hypothesis test, it was determined there was no significant evidence. However, in the future, more data would make the conclusion more accurate. All in all, it was a good experience to find out if one gender preferred one thing more than the other.

**Two-way table (the data given is the observed count)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Dog person | Cat person | Both  | Neither  | **Total**  |
| Female  | 36 | 3 | 33 | 1 | 73 |
| Male | 30 | 2 | 15 | 0 | 47 |
| **Total**  | 66 | 5 | 48 | 1 | 120 |

**Expected Count**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Dog person | Cat person | Both  | Neither  |
| Female | 40.15 | 3.0417 | 29.2 | 0.6083 |
| Male  | 25.85 | 1.9583 | 18.8 | 0.3917 |

**X2 values**

|  |  |  |  |
| --- | --- | --- | --- |
| .4290 | 5.7168 x 10e-4 | .4945 | .2522 |
| .6662 | 8.8796 x 10e-4 | .7681 | .3917 |