

Video 13 Two-Way Tables

1. Give two (or more) examples of categorical variables.
 - happiness,
 - physical beauty
 - satisfaction
2. What did Somerville include in its 2011 census that was unconventional?
Somerville included unconventional questions such as “ How satisfied are you with your life in general?” and “...how satisfied are you with Somerville as a place to live?”
3. In the two-way table used to organize the responses to rating personal happiness and Somerville’s physical beauty, which variable was the row variable and which was the column variable? Explain.
In the two way table shown in the video had *Happiness* as the row variable and *Physical Beauty* as the column variable. The results for happiness are displayed in rows with the totals at the right end of the rows. The results for physical beauty are displayed in columns with the totals at the bottom of the columns.
4. As the level of happiness went up (from Unhappy to So-so to Happy), what happened to the percent of respondents who rated Somerville’s physical beauty as Bad?
The percent of respondents who rated Somerville’s physical beauty as bad went up drastically. Out of the 1,186 residents who rated the physical beauty as bad, only 90 reported to be feeling unhappy while 555 reported feeling so-so.

Video 29 Chi Square

1. What type of research is the host of this series, Dr. Pardis Sabeti, involved in?
Dr. Sabeti is a computational geneticist. She studies micro-organisms, infections and diseases.
2. Dr. Sabeti’s work is modeled off of work done on malaria. What genetic mutation is an important source of resistance to malaria? Those Sickle Cell Anemia were found to be protected from malaria.
3. What were the null and alternative hypotheses for testing whether the sickle cell gene protects against malaria?
The null hypothesis is that there is no association between malaria and having the HbS sickle cell gene. The alternative hypothesis is that there is an association between malaria and having the HbS gene.
4. What is the rule for calculating the expected counts under the null hypothesis?
The expected count is calculated by multiplying the row total by the column total and dividing that number by the grand total.

5. The p-value of the chi-square test statistic turned out to be approximately 0. What can you conclude based on this p-value? The p-value tells us that there is a relationship between having HbS sickle cell and being protected from malaria. The null hypothesis is rejected.