Video 13 Two-Way Tables

1. Give two (or more) examples of categorical variables.

　　　Two examples of categorical variables are race and gender.

2. What did Somerville include in its 2011 census that was unconventional?

　　　In its 2011 census, Somerville included unconventional survey questions that included

subjective, qualitative questions such as "How happy do you feel?"

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 to organize the responses to rating personal happiness and

Somerville's physical beauty, the row variable was Happiness, and the column variable was

Physical Beauty.　Happiness was measured as Unhappy, So-So, and Happy, while Physical

Beauty was measured as Bad, Okay, or Good.

4. As the level of happiness went up (from Unhappy to So-so to Happy), what happened to the percentage of respondents who rated Somerville's physical beauty as Bad?

　　　As the level of happiness went up (from Unhappy to So-So to Happy), the percentage of

respondents who rated Somerville's physical beauty as bad decreased.　As Happiness

increased, the percentage of bad responses for Beauty went down.

Video 29 Chi Square

1. What type of research is the host of this series, Dr. Pardis Sabeti, involved in?

Dr. Pardis Sabeti is involved in researching infectious microorganisms that invade human beings, the genetics and genomes of humans, and how genetics can relate to the creation and discovery of new treatments.

2. Dr. Sabeti's work is modeled off of work done on malaria. What genetic mutation is an important source of resistance to malaria?

Dr. Sabeti's work is modeled on the genetic work done on malaria and how the HbS sickle cell hemoglobin gene (carrier) can protect against malaria and other potential diseases. Her work continues to explore how genomes might provide clues to disease resistance.

3. What were the null and alternative hypotheses for testing whether the sickle cell gene protects against malaria?

The null hypothesis for testing whether the sickle cell gene protects against malaria was: "There is no association between contracting malaria and having the HbS sickle cell gene," while the alternative hypothesis was "There is an association between contracting malaria and having the protective HbS sickle cell gene." Is there a link between "the status of the two variables Malaria/General Population and HbS/HbA? (Annenberg Learner, Against All Odds Episode 29- "Inference for Two-Way Tables", 2014).

4. What is the rule for calculating the expected counts under the null hypothesis?

The rule for calculating the expected counts under the null hypothesis is–the row total times the column total divided 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?

When the p-value of the chi-square test is 0, it means that it is exceedingly low or nothing. There is a strong case for rejecting the null hypothesis since the evidence suggests a very strong relationship between the variables. In the case of Dr. Sabeti's work, it supports her research that the HbS sickle cell variant protects against malaria when found in the genomes of individuals.

References

Annenberg Learner, Against All Odds Episode 29- "Inference for Two-Way Tables", 2014.