Chapter 11: Inference for Distributions of Categorical Variables: Chi-Square Procedures

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| Key Vocabulary: | chi-square distribution |
| chi-square test for goodness of fit | components of chi-square |
| segmented bar chart | cell counts |
| chi-square statistic | r x c table |
| expected count | sum ( ) |
| observed count | $χ$2cdf (leftbound, rightbound, df) |
| degrees of freedom | $χ$2-Test |

11.1 Chi-Squared Goodness of Fit Tests (pp.678-695)

1. What does the term *expected count* mean, and how is it calculated?
2. What is the *chi-square statistic*?
3. Why do we divide by the expected counts in the χ2 statistic?

**CYU Page 681**

1. Is the χ2 sampling distribution normal? Describe its shape.
2. How many degrees of freedom does the *chi-square distribution* have?
3. What is the shape of a *chi-square distribution*? What happens to the shape as the degrees of freedom increases? (Illustrate with a diagram)
4. How do you find the p-value on the χ2 table?

**CYU page 684**

1. State the general form for the null hypotheses for a χ2 goodness of fit test.
2. State the general form for the alternative hypotheses for a χ2 goodness of fit test.
3. What conditions must be met in order to use the *goodness of fit test*?

**CYU page 689**

1. What is meant by a *component* of chi-square?
2. Why is it necessary to perform follow-up analysis to a chi-square test?

11.2 Inference for Two-Way Tables (pp.696-731)

**CYU Page 698**

1. State the null and alternative hypotheses for comparing more than two population proportions.
2. How do you calculate the expected count in any cell of a two-way table assuming the null hypothesis is true?

**CYU Page 703**

1. How many degrees of freedom does a chi-square test for a two-way table with r rows and c columns have?
2. What requirements must be checked before carrying out a Chi-square test?

**CYU Page 705**

1. Summarize how to carry out a Chi-square Test for Homogeneity of Populations:

**CYU Page 708**

1. What follow-up analysis should be done with the Chi-square Test for Homogeneity? What should you look for?
2. What is the difference between the Chi-square Test for Homogeneity and a two sample test of proportions?

**CYU Page 713**

1. State the null and alternative hypotheses for a Chi-square test for Association/Independence.
2. Summarize how to carry out a Chi-square Test for Association/Independence:

**CYU Page 718**

1. What is the difference between the Chi-square Test for Homogeneity and Association?
2. What can we do if the expected counts are not all at least 5?