Categorical Data Analysis: Chi-Squared Tests

13.5   Finding Expected Cell Counts

A paper published in 2008 looked at ethnic, gender, and acculturation influences on sexual behaviors. A total of 1,348 undergraduate students (429 men, 919women) at a large, public Southwestern university participated in this study for course credit in an introductory psychology course. The sample was composed of 67% Euro-American, 17% Hispanic, and 16% Asian participants. Participants ranged from 18 to 42 years old with a mean age of 19.03 for men (range, 18–32) and 18.79 for women (range, 18–42). As part of the study, men and women were asked, ''with how many partners have you had sexual intercourse, or oral sex, in your lifetime?'' The results for women are included below:

Number of lifetime sexual partners	Women			
	Euro-American	Hispanic	Asian	**Totals**
0	92	23	55	170
1	111	31	36	178
2 – 5	253	66	44	363
6 – 10	111	19	9	139
More than 10	49	17	3	69
Totals	616	156	147	919

Assume we are testing a claim that a woman's ethnicity and number of sexual partners she has had are independent and find the following expected cell counts:

1. Find E_{32}

2. Find E_{11}

3. Find E_{53}

Answers:

1. The expected value for the cell in the third row and second column:

$$\frac{363*156}{919} \approx 61.619$$

2. The expected value for the cell in the first row and first column:

$$\frac{170*616}{919} \approx 113.950$$

3. The expected value for the cell in the fifth row and third column:

$$\frac{147*69}{919} \approx 11.037$$