

Chapter 9 .5 extra credit

1. A researcher from the Agriculture Department designed a study to see if there was a preferred type of meat depending on where people lived. The first independent variable would be type of meat preferred – pork, chicken, beef, and fish, and the second independent variable would be region of the U.S. where the participant lived – North, South, East, or West. Each participant in the study would be randomly selected from the U.S. population. Participants would be asked to indicate where they live and which of the four type of meats do they prefer. The data collected would indicate the frequency for each of the sixteen categories. The contingency table for this research design (without the data) appears below.

	North	South	East	West
Pork				
Chicken				
Beef				
Fish				

2.

- a. The null hypothesis assumes that the frequencies across the three categories will be the same in 1993 as it was in 1960. Any observed difference between the two samples' frequencies is assumed to be solely due to random error/chance.
- b. Two-way chi-square test.

•	
OBSERVED FREQUENCIE	ES:

	Career	Family	Other	
Men 1960	65	42	13	120
Men 1993	25	68	17	110
	90	110	30	230

EXPECTED FREQUENCIES:

	Career	Family	Other
Men 1960	46.95652	57.3913	15.65217
Men 1993	43.04348	52.6087	14.34783

CHI-SQUARE FORMULA:					
6.933374 4.127668 0.449396					
7.56368	4.502911	0.49025			

Obtained Chi-Square			
Statistic:	=	24.06728	

Statistical Conclusion: Since $\chi^2(2) = 24.05$, p < .05; Reject the null hypothesis. The critical chisquare value at .05 with df=2 is 5.99.

- c. The results suggest that men in 1993 claim that their family is the greatest source of their satisfaction which is a change from 1960 when men claimed their career was their greatest source of satisfaction. The obtained differences in frequencies does not appear to be solely due to random error/chance but indicate a real change in men's source of greatest satisfaction.
- 3.
- a. The null hypothesis assumes that the frequency of errors across the four sections will be the same. Any observed difference in frequencies across the four sections is assumed to be solely due to random error/chance.

OBSERVED FREQUENCIES:				
Section1	Section2	Section3	Section4	Total Errors:
39	15	28	18	100
EXPECTE	D FREQUE	ENCIES:		
25	25	25	25	
CHI-SQU	ARE FORM	ULA:		
7.84	4	0.36	1.96	
Obtained Chi-square Statistic:			14.16	

b. One-Way Chi-Square Test:

Statistical Conclusion: Since χ^2 (2) = 14.16, *p* < .05; Reject the null hypothesis. The critical chi-square value at .05 with df=3 is 7.82.

c. The results suggest that students do not make an equal number of errors across all four sections of the test, but make more errors in some sections versus others. The obtained differences in frequencies does not appear to be solely due to random error/chance but indicate a real difference in difficulty across sections of the test.