

SOCI 102 - Exam 3 - FA13 Practice

Multiple Choice

Identify the choice that best completes the statement or answers the question.

1. In a cross tabulation, the intersection of a row and column is referred to as:

- a. the node
- b. the intersection
- c. a cell
- d. the intercept

Answer: C – Definition page 189

2. A relationship between two variables in which the variables vary in the opposite direction (i.e., one increases while the other decreases, or vice versa) is referred to as a:

- a. stronger
- b. weaker
- c. negative
- d. positive

Answer: C – Definition page 197

Consider the following hypothetical data on each respondent's region of U.S. residence and whether or not they have health insurance of some kind. Construct a bivariate table containing the appropriate percentages for each cell in the table.

Person	Region	Health Insurance
1	South	Yes
2	South	Yes
3	North	No
4	North	No
5	North	Yes
6	North	Yes
7	North	Yes
8	South	No
9	South	No
10	South	No
11	North	Yes
12	North	Yes
13	North	No
14	North	No
15	South	No

Answer: For questions 3 – 16, we first need to construct a bivariate table, with row%, column% and total% values:

	South	North	Total
Yes	2	5	7
row%	28.57%	71.43%	
col%	33.33%	55.56%	
total%	13.33%	33.33%	46.67%
No	4	4	8
row%	50.00%	50.00%	
col%	66.67%	44.44%	
total%	26.67%	26.67%	53.33%
Total	6	9	15
total%	40.00%	60.00%	

3. How many respondents were from the South?

- a. 5
- b. 6
- c. 7
- d. 8

Answer: B - This question asks about only one variable (Region), so we look at the marginals to answer it. Of the 15 respondents, 6 were from the South.

	South	North	Total
Yes	2	5	7
row%			
col%			
total%			
No	4	4	8
row%			
col%			
total%			
Total	6	9	15
total%			

4. How many respondents had insurance?

- a. 5
- b. 6
- c. 7
- d. 8

Answer: C - This question asks about only one variable (Insurance), so we look at the marginals to answer it. Of the 15 respondents, 7 had insurance.

	South	North	Total
Yes	2	5	7
row%			
col%			
total%			
No	4	4	8
row%			
col%			
total%			
Total	6	9	15
total%			

5. What percentage of respondents from the North had insurance?

- a. 33.33%
- b. 46.67%
- c. 55.56%
- d. 71.43%

Answer: C - This question asks only about respondents from the North. Since North is a column, the answer will be the column% of the cell where North and Yes intersect. Of the 9 respondents from the North, 5 had insurance. $5/9 = 55.56\%$

	South	North	Total
Yes		5	
row%			
col%		55.56%	
total%			
No		4	
row%			
col%		44.44%	
total%			
Total		9	
total%			

6. What percentage of respondents from the South had insurance?

- a. 13.33%
- b. 28.57%
- c. 33.33%
- d. 46.67%

Answer: C - This question asks only about respondents from the South. Since South is a column, the answer will be the column% of the cell where South and Yes intersect. Of the 6 respondents from the North, 2 had insurance. $2/6 = 33.33\%$

	South	North	Total
Yes	2		
row%			
col%	33.33%		
total%			
No	4		
row%			
col%	66.67%		
total%			
Total	6		
total%			

7. What percentage of respondents with insurance were from the North?

- a. 33.33%
- b. 46.67%
- c. 55.56%
- d. 71.43%

Answer: D - This question asks only about respondents with insurance. Since insurance is a row, the answer will be the row% of the cell where North and Yes intersect. Of the 7 respondents with insurance, 5 were from the North. $5/7 = 71.43\%$

	South	North	Total
Yes	2	5	7
row%	28.57%	71.43%	
col%			
total%			
No			
row%			
col%			
total%			
Total			
total%			

8. What percentage of respondents with insurance were from the South?

- a. 13.33%
- b. 28.57%
- c. 33.33%
- d. 46.67%

Answer: B - This question asks only about respondents with insurance. Since insurance is a row, the answer will be the row% of the cell where South and Yes intersect. Of the 7 respondents with insurance, 2 were from the South. $2/7 = 28.57\%$

	South	North	Total
Yes	2	5	7
row%	28.57%	71.43%	
col%			
total%			
No			
row%			
col%			
total%			
Total			
total%			

9. What percentage of respondents had insurance and were from the North?

- a. 33.33%
- b. 46.67%
- c. 55.56%
- d. 71.43%

Answer: A - This question asks about all of the respondents. How many out of all of them, were both from the North, and had insurance. Since the question is out of the total number of respondents, the answer will be the total% of the cell where North and Yes intersect. Of the 15 respondents 5 were both from the North, and had insurance. $5/15 = 33.33\%$

	South	North	Total
Yes		5	
row%		71.43%	
col%		55.56%	
total%		33.33%	
No			
row%			
col%			
total%			
Total			15
total%			

10. What percentage of respondents had insurance and were from the South?

- a. 13.33%
- b. 28.57%
- c. 33.33%
- d. 46.67%

Answer: A - This question asks about all of the respondents. How many out of all of them, were both from the South, and had insurance. Since the question is out of the total number of respondents, the answer will be the total% of the cell where South and Yes intersect. Of the 15 respondents 2 were both from the North, and had insurance. $2/15 = 13.33\%$

	South	North	Total
Yes	2		
row%	28.57%		
col%	33.33%		
total%	13.33%		
No			
row%			
col%			
total%			
Total			15
total%			

11. What percentage of respondents from the North did not have insurance?

- a. 26.67%
- b. 44.44%
- c. 55.00%
- d. 53.33%

Answer: B - This question asks only about respondents from the North. Since region is a column, the answer will be the column% of the cell where North and No intersect. Of the 9 respondents from the North, 4 did not have insurance. $4/9 = 44.44\%$

	South	North	Total
Yes		5	
row%			
col%		55.56%	
total%			
No		4	
row%			
col%		44.44%	
total%			
Total		9	
total%			

12. What percentage of respondents from the South did not have insurance?

- a. 26.67%
- b. 40.00%
- c. 50.00%
- d. 66.67%

Answer: D - This question asks only about respondents from the South. Since region is a column, the answer will be the column% of the cell where South and No intersect. Of the 6 respondents from the South, 4 did not have insurance. $4/6 = 66.67\%$

	South	North	Total
Yes	2		
row%			
col%	33.33%		
total%			
No	4		
row%			
col%	66.67%		
total%			
Total	6		
total%			

13. What percentage of respondents with no insurance were from the North?

- a. 26.67%
- b. 44.44%
- c. 50.00%
- d. 53.33%

Answer: C - This question asks only about respondents with no insurance. Since No insurance is a row, the answer will be the row% of the cell where North and No intersect. Of the 8 respondents from the North, 4 had no insurance. $4/8 = 50.00\%$

	South	North	Total
Yes			
row%			
col%			
total%			
No	4	4	8
row%	50.00%	50.00%	
col%			
total%			
Total			
total%			

14. What percentage of respondents with no insurance were from the South?

- a. 26.67%
- b. 40.00%
- c. 50.00%
- d. 66.67%

Answer: C - This question asks only about respondents with no insurance. Since No insurance is a row, the answer will be the row% of the cell where South and No intersect. Of the 8 respondents from the South, 4 had no insurance. $4/8 = 50.00\%$

	South	North	Total
Yes			
row%			
col%			
total%			
No	4	4	8
row%	50.00%	50.00%	
col%			
total%			
Total			
total%			

15. What percentage of respondents had no insurance and were from the North?

- a. 26.67%
- b. 44.44%
- c. 55.00%
- d. 53.33%

Answer: A - This question asks about all of the respondents. How many out of all of them, were both from the North, and had no insurance. Since the question is out of the total number of respondents, the answer will be the total% of the cell where North and No intersect. Of the 15 respondents 4 were both from the North, and had insurance. $4/15 = 26.67\%$

	South	North	Total
Yes			
row%			
col%			
total%			
No		4	
row%		50.00%	
col%		44.44%	
total%		26.67%	
Total			15
total%			

16. What percentage of respondents had no insurance and were from the South?

- a. 26.67%
- b. 40.00%
- c. 50.00%
- d. 66.67%

Answer: A - This question asks about all of the respondents. How many out of all of them, were both from the South, and had no insurance. Since the question is out of the total number of respondents, the answer will be the total% of the cell where South and No intersect. Of the 15 respondents 4 were both from the North, and had insurance. $4/15 = 26.67\%$

	South	North	Total
Yes			
row%			
col%			
total%			
No	4		
row%	50.00%		
col%	66.67%		
total%	26.67%		
Total			15
total%			

The following data were obtained from the General Social Survey.

Position on Abortion	Religious Affiliation	
	Protestant	Catholic
Support	156	86
Oppose	296	139

We will need to calculate marginal as follows:

	Protestant	Catholic	Total
Support	156	86	242
Oppose	296	139	435
Total	452	225	677

17. Calculate the marginals for the table above. The row marginal values are _____ for “Support” and _____ for “Oppose”.

- a. 242, 435
- b. 156, 86
- c. 296, 139
- d. 452, 225

Answer: A

	Protestant	Catholic	Total
Support	156	86	242
Oppose	296	139	435
Total	452	225	677

18. Calculate the marginals for the table above. The column marginal values are _____ for “Protestant” and _____ for “Catholic”.

- a. 242, 435
- b. 156, 86
- c. 296, 139
- d. 452, 225

Answer: D

	Protestant	Catholic	Total
Support	156	86	242
Oppose	296	139	435
Total	452	225	677

19. Calculate the expected frequencies for the table above. The expected frequency for Protestans that Support abortion is $f_e =$ _____

- a. 80.43
- b. 144.57
- c. 161.57
- d. 290.43

Answer: C -- Protestant X Support = $(242*452)/677 = 161.57$

20. Calculate the expected frequencies for the table above. The expected frequency for Catholics that Support abortion is $f_e =$ _____

- a. 80.43
- b. 144.57
- c. 161.57
- d. 290.43

Answer: A -- Catholic X Support = $(242*225)/677 = 80.43$

21. Calculate the expected frequencies for the table above. The expected frequency for Catholics that Oppose abortion is $f_e =$ _____

- a. 80.43
- b. 144.57
- c. 161.57
- d. 290.43

Answer: B -- Catholic X Oppose = $(435*225)/677 = 144.57$

22. Calculate the expected frequencies for the table above. The expected frequency for Protestans that Oppose abortion is $f_e =$ _____

- a. 80.43
- b. 144.57
- c. 161.57
- d. 290.43

Answer: D -- Protestant X Oppose = $(435*452)/677 = 290.43$

23. The chi-square test requires the following assumption:
- a population distribution that is approximately normal
 - random sampling
 - a standard deviation equal to 1.0
 - no extreme or outlying observations

Answer: B – Your textbook says that the Chi-square test “requires no assumptions about the shape of the population distribution from which a sample drawn” (pg. 202). Choices a, c and d are all about the shape of a distribution, only b is not about the shape of the distribution.

24. The observation that two variables are unrelated in the population is referred to as:
- statistical independence
 - statistical significance
 - statistical inference
 - statistical dependence

Answer: A – Definition page 203

25. The number of degrees of freedom for a chi-square test is calculated as:
- $n-1$
 - $n+1$
 - $(rows-1)(columns+1)$
 - $(rows-1)(columns-1)$

Answer: D – Definition page 208

26. Chi-square values are never _____.
- positive
 - negative
 - greater than 100
 - zero

Answer: B – Definition page 207

Short Answer

Hypothetical data are provided below on relationship between sex and marital satisfaction. The table includes expected frequencies.

Marital Satisfaction	Sex		Row Total
	Male	Female	
Satisfied	309	255	564
f_e	247	317	
Unsatisfied	107	278	385
f_e	169	216	
Column Total	416	533	949

27. Calculate a Chi-square statistic for the data in the table above.

Answer: First we need to calculate $(f_o - f_e)^2 / f_e$ for each cell:

	Male	Female	Total
Satisfied	309	255	564
f_e	247	317	
$(f_o - f_e)$	62	-62	
$(f_o - f_e)^2$	3844	3844	
$(f_o - f_e)^2 / f_e$	15.56	12.13	
Unsatisfied	107	278	385
f_e	169	216	
$(f_o - f_e)$	-62	62	
$(f_o - f_e)^2$	3844	3844	
$(f_o - f_e)^2 / f_e$	22.75	17.80	
Total	416	533	949

Chi-square = $15.56 + 12.13 + 22.75 + 17.80 = 68.24$

df = $(2-1) * (2-1) = 1 * 1 = 1$

critical value at .05 = 3.841

critical value at .01 = 6.635

df	.99	.98	.95	.90	.80	.70	.50	.30	.20	.10	.05	.02	.01	.001
1	.00157	.00228	.00333	.0158	.0612	.140	.355	1.074	1.642	2.7	3.841	5.412	6.635	10.827
2	.0201	.0404	.103	.211	.446	.713	1.386	2.408	3.219	4.605	5.991	7.824	9.210	13.815
3	.115	.185	.352	.584	1.005	1.424	2.366	3.665	4.642	6.251	7.815	9.837	11.341	16.268
4	.297	.429	.711	1.064	1.649	2.195	3.357	4.878	5.989	7.779	9.488	11.668	13.277	18.465
5	.554	.752	1.145	1.610	2.343	3.000	4.351	6.064	7.289	9.236	11.070	13.388	15.086	20.517

To report the results: Chi-square (1) = 68.24, $p < .001$

Since our obtained Chi-square value (68.24) is greater than the critical value at .05 (3.841) we can say YES there is a significant relationship between the 2 variables (Sex and Satisfaction).

The p value is $< .001$ because our obtained Chi-square value (68.24) is greater than the critical value at .001 (10.827).