

1. Multiple Choice: Q3.1: The central limit theorem,...

Points: 5

Question	The central limit theorem, and our ability to use normal distributions can be applied to:
Answer	a. proportions regardless of the number of categories ☒ b. dichotomous proportions (2-categories only) c. means but never proportions
Correct Feedback	With two categories, proportions and the difference between proportions fall within the structure of the central limit theorem.
Incorrect Feedback	With two categories, proportions and the difference between proportions fall within the structure of the central limit theorem.

2. Multiple Choice: Q3.2: Not considering sample...

Points: 5

Question	Not considering sample size, the standard error of 2-category proportions will be highest when the two categories are split:
Answer	a. 75/25 b. 0/100 ☒ c. 50/50
Correct Feedback	50/50 offers the greatest possible variability. It also produces the highest numerator for computing the standard error. 100/0 would give us no error at all.
Incorrect Feedback	50/50 offers the greatest possible variability. It also produces the highest numerator for computing the standard error. 100/0 would give us no error at all.

3. Short Answer: Q3.3: A survey is taken right before an ele...

Points: 10

Question	A survey is taken right before an election for mayor. The survey organization states that the predicted vote for the incumbent mayor is 53% with a margin of error of 4% (using 95% confidence interval logic). Assuming that the survey randomly sampled those who voted in the election (externally valid) and everyone answered honestly (internally valid), what can you state about the electoral fortunes of the incumbent?
Answer	The election is too close to call. We can't confidently reject that the incumbent received as little as 49% of the vote. Of course, we can't reject a victory as high as 57%.

4. Fill in the Blank: Q3.4: We have a crosstable...

Points: 5

Question	We have a crosstable with 3 categories of the dependent variable, 4 of the independent variable. For the chi-square statistic with 2 variables, the degrees of freedom will be equal to (write in the correct number):	
Evaluation Method	Answer	Case Sensitivity
Exact Match	6	
Exact Match	six	
Correct Feedback	For a two variable chi-square, $df = (\text{number of row categories} - 1) * (\text{number of column categories} - 1)$. $(3-1) * (4-1) = 2 * 3 = 6$.	
Incorrect Feedback	For a two variable chi-square, $df = (\text{number of row categories} - 1) * (\text{number of column categories} - 1)$. $(3-1) * (4-1) = 2 * 3 = 6$.	

5. True/False: Q3.5: If we have a sample table with 1 degr...

Points: 5

Question	If we have a sample table with 1 degree of freedom, we need not make any adjustment to the chi-square calculation.
Answer	True ☒ False
Correct Feedback	We need to add a "correction for continuity (Yates)." Before squaring the categorical deviation score, we must take its absolute value and subtract .5.
Incorrect Feedback	We need to add a "correction for continuity (Yates)." Before squaring the categorical deviation score, we must take its absolute value and subtract .5.

6. Multiple Choice: Q3.6: In calculating the chi-squ...

Points: 5

Question	In calculating the chi-square for a table, we find that the calculated value is <i>below</i> the critical value cutoff (95% confidence interval) for the appropriate degrees of freedom. We can therefore state that, in the population from which our sample was randomly selected, the relationship between our two variables:
Answer	a. must be statistically independent b. cannot be statistically independent ☒ c. can be statistically independent, but that is only one of several possibilities that we can't confidently reject
Correct Feedback	Not being able to reject 'statistical independence' is not the same as accepting it as the only choice—it is only one possibility that we cannot confidently reject.
Incorrect Feedback	Not being able to reject 'statistical independence' is not the same as accepting it as the only choice—it is only one possibility that we cannot confidently reject.

7. Multiple Choice: Q3.7: In calculating the chi-squ...

Points: 5

Question	In calculating the chi-square for a table, we find that the calculated value is <i>above</i> the critical value cutoff (95% confidence interval) for the appropriate degrees of freedom. We can therefore state that, in the population from which our sample was randomly selected, the relationship between our two variables:
Answer	a. cannot be statistically independent b. must be statistically independent ☒ c. most likely is not statistically independent, but we can never be absolutely sure
Correct Feedback	Being able to confidently reject 'statistical independence' is not the same as guaranteeing that it isn't.
Incorrect Feedback	Being able to confidently reject 'statistical independence' is not the same as guaranteeing that it isn't.

Points: 5

8. Multiple Choice: Q3.8: Generally, when we speak about ...

Question Generally, when we speak about the 'gender gap' in U.S. politics, we are referring to the fact that, in the last 40 years:

Answer

- a. A majority of women have voted Democratic for President, while a majority of men have voted Republican.
- b. A majority of women have voted Republican for President, while a majority of men have voted Democratic.
- ☒ c. Regardless of majorities, women have been more likely to vote Democratic than men.
- d. Regardless of majorities, women have been more likely to vote Republican than men.

Points: 10

9. Essay: Q3.9: We have a crosstable ...

Question

We have a crosstable with two variables. The IV is whether or not one considers health care to be the most important issue facing this country, the dependent variable is whether or not one approves of the job President Obama is doing. The breakdown is as follows:

	IMPORTANT	NOT IMPORTANT	TOTAL
APPROVE	160	240	400
DISAPPROVE	80	420	500
	240	660	900

Assuming a null hypothesis of statistical independence in the population, calculate the actual number (not percentage nor proportion) of respondents whom you would expect to be categorized as both "IMPORTANT" and "APPROVE." This is the *expected frequency* of that cell (fe). Carry out all calculations to one decimal point.

Answer

400 of 900 of all respondents approve. That equals 44.4%

If statistical independence obtained, then we would have expected 44.4% of the 240 respondents who felt health care to be important to approve. $.44 * 240 = 105.6$.

Another way of doing this would be to multiply the total number of approvers (400) by the total number within the IMPORTANT category (240) and divide by our total (900):

$$(400 * 240) / 900 = 106.7 \text{ (we don't have rounding error twice here).}$$

Points: 5

10. True/False: Q3.10: Chi-square will always be 0 when Lamb...

Question

Chi-square will always be 0 when Lambda is 0.

Answer

True

☒ False

Correct Feedback

Chi-square reaches 0 only under conditions of statistical independence. Lambda will be 0 under statistical independence, but also accord. "Statistical independence" is a special form of 'accord'. Lambda will always be 0 when cs is 0. The opposite is not true.

Incorrect Feedback

Chi-square reaches 0 only under conditions of statistical independence. Lambda will be 0 under statistical independence, but also accord. "Statistical independence" is a special form of 'accord'. Lambda will always be 0 when cs is 0. The opposite is not true.

11. Essay: Q3.11: We have a data set that has informati...

Question

We have a data set that has information on all 435 U.S. House districts. We have two variables of interest:

- whether a majority of voters in the district support gay rights (yes/no)
- whether the district elected a Democratic or Republican House member

We calculate a lambda with the partisan direction (D or R won) of the vote as our dependent variable. That lambda is equal to .53. Describe what that lambda means in as much detail as possible. Refer specifically to the variables in question. That .53 must be part of your answer.

Answer

Knowing whether a majority of a district supports gay rights helps us to reduce our error in guessing for which party that district voted for its U.S. House member *proportionately* by 53%.

2 of 10 points deducted if 'proportionately' not mentioned

3 of 10 points deducted if variable information is not used (The IV reduces...)

12. True/False: Q3.11a: That lambda of .53 guarantees that di...

Points: 5

Question

That lambda of .53 guarantees that districts in which a majority supported gay rights elected a Democratic. Think carefully about this.

Answer

True

 False

Correct Feedback

Lambda is a nominal measure of association. Consequently, we don't know the 'direction' of the outcome.

Incorrect Feedback

Lambda is a nominal measure of association. Consequently, we don't know the 'direction' of the outcome.

13. Fill in the Blank: Q3.12: Fill in the missing entry if this tab...

Points: 5

Question

Fill in the missing entry if this table represents information on two variables where the lambda = 0 AND statistical independence obtains. The IV is whether one has a college degree, the DV is whether one voted.

	No College	College
Did Not Vote	240	180
Voted	160	_____

Evaluation Method

Answer

Case Sensitivity

Exact Match

120

Correct Feedback

The modal category must remain the same and with exactly equal proportions.



14. Fill in the Blank: Q3.13: Fill in the missing entry if this tab...

Points: 5

Question	Fill in the missing entry if this table represents information on two variables where strict perfect association obtains. The IV is whether one has a college degree, the DV is whether one voted.		
		No College	College
	Did Not Vote	240	___
	Voted	0	180

Evaluation Method	Answer	Case Sensitivity
Exact Match	0	
Correct Feedback	Each category of the IV must uniquely match with one category of the DV	
Incorrect Feedback	Each category of the IV must uniquely match with one category of the DV	

15. Fill in the Blank: Q3.14: Fill in the missing entry if this tab...

Points: 5

Question	Fill in the missing entry if this table represents information on two variables where the lambda = 0 BUT statistical independence does not obtain. The IV is whether one has a college degree, the DV is whether one voted.		
		No College	College
	Did Not Vote	240	180
	Voted	160	___

Evaluation Method	Answer	Case Sensitivity
Exact Match	any number between 0 and 180, but not 120	
Correct Feedback	The modal category must remain the same but without exactly equal proportions. If '180', either can be modal.	

16. True/False: Q3.15: Answer 'True' for 10 free points

Points: 10

Question	Answer 'True' for 10 free points	
Answer	☒ True ☐ False	