

Chi-Square

In some Hollywood movies, there will be a scene where Russian or the U.S. President is about to launch a nuclear attack against the other country. Luckily, at the last second, our hero will avoid a catastrophe. Using the data collected by the Pew research group, investigate the question “Is there a similar cold-War era relationship with the US and China?”.

Do you think the United States and China will one day confront resembling the Cold War? Millions of people died in Cold War due to proxy wars. At the same time, many interstate highways, including I-35, were constructed during that era to have a quick national response in case of an atomic bomb attack by Russia. Internet and space explorations are indirect results of the Cold-War era race.

For this assignment, we are going to evaluate the responses from question 4 “How would you rate the likelihood of the current rivalry between China and the United States escalating into a confrontation resembling the Cold War?” to test whether the political view matters in this hypothetical scenario. In other words, we are interested in **the research question “Are people with different political views equally likely to say conflict akin to the Cold War will occur between China and the US?”**. To answer this research question, we will complete the following tasks.

1. Prepare a contingency table showing observed frequencies of polview (columns) by Q4 (rows) using the original PEW2020 data. **Please make sure to include your name in the footer for this question. Failure to complete this will result in no credit.** The table should contain the following categories of the two variables. It is acceptable if your output shows the variable values in numbers, but this issue could be solved by reimporting PEW2020 data into library before analysis. (5pts)

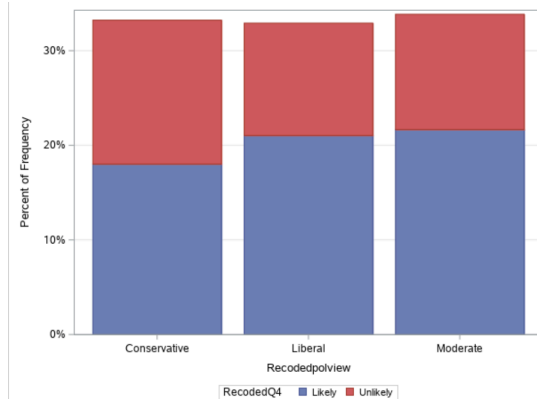
Q4 Variable value	User defined format
1	Very likely
2	Somewhat likely
3	Somewhat unlikely
4	Very Unlikely
9	DK/Refused
polview Variable value	User defined format
1	Very conservative
2	Somewhat conservative
3	Moderate
4	Somewhat liberal
5	Very liberal
8	Don't know
9	Refused

Table of Q4 by polview								
Q4(Q4. How would you rate the likelihood of the current rivalry between China and the United States escalating into a confrontation resembling the Cold War?)	polview(POLVIEW. Generally speaking, would you describe your political views as ...?)							
	Very conservative	Somewhat conservative	Moderate	Somewhat liberal	Very liberal	Don't know	Refused	Total
Very likely	25	25	64	33	18	1	6	172
Somewhat likely	56	67	144	90	61	5	5	428
Somewhat unlikely	43	48	85	48	35	2	4	265
Very unlikely	35	20	32	16	15	1	4	123
DK/Refused	2	7	8	2	0	0	0	19
Total	161	167	333	189	129	9	19	1007
First and Last Name								

Or

Table of Q4 by polview									
Q4(Q4. How would you rate the likelihood of the current rivalry between China and the United States escalating into a confrontation resembling the Cold War?)	polview(POLVIEW. Generally speaking, would you describe your political views as ...?)								
	1	2	3	4	5	8	9	Total	
1	25	25	64	33	18	1	6	172	
2	56	67	144	90	61	5	5	428	
3	43	48	85	48	35	2	4	265	
4	35	20	32	16	15	1	4	122	
9	2	7	8	2	0	0	0	19	
Total	161	167	333	189	129	9	19	1007	
First and Last Name									

- Use Graph Tasks to create **Vertical Stacked Bar Chart** of Recodedpolview (Category) and RecodedQ4(Subcategory) in the PEWFILTER2 (You created this data following the instructions of Chi-square in SAS). (5pts)



- Prepare a contingency table showing both of observed and expected frequencies of Recodedpolview (columns) by RecodedQ4 (rows) using the data PEWFILTER2 (You created this data following the instructions of Chi-square in SAS). (5pts)

Table of RecodedQ4 by Recodedpolview				
RecodedQ4	Recodedpolview			Total
	Conservative	Liberal	Moderate	
Likely	173 193.73	202 191.9	208 197.37	583
Unlikely	146 125.27	114 124.1	117 127.63	377
Total	319	316	325	960

- State the null hypothesis and alternate hypothesis for this analysis. (5pts)
 H_0 : There is not a relationship between political view and the opinion of the likelihood of saying conflict akin to the Cold War will occur between the China and the US .
 H_1 : There is a relationship between political view and the opinion of the likelihood of saying conflict akin to the Cold War will occur between the China and the US .

5. Perform a Chi-Square test to answer the research question. Provide a screen shot of the table that contains the test results. **Please make sure to include your name in the footer for this question. Failure to complete this will result in no credit.** (5pts)

Statistics for Table of RecodedQ4 by Recodedpolview

Statistic	DF	Value	Prob
Chi-Square	2	8.4568	0.0146
Likelihood Ratio Chi-Square	2	8.3954	0.0150
Mantel-Haenszel Chi-Square	1	6.3954	0.0114
Phi Coefficient		0.0939	
Contingency Coefficient		0.0934	
Cramer's V		0.0939	

Sample Size = 960

First and Last Name

6. What is the critical χ^2 value for this problem at the 0.05 significance level (you can use a Chi-square table or the Chi-square Distribution in https://gallery.shinyapps.io/dist_calc/)? (5pts)
The critical value is 5.99
If using the Chi-square Distribution in https://gallery.shinyapps.io/dist_calc/, select Chi-squared distribution, slide degree of freedom to 2, and make sure upper tail is shown. The right plot should show $P(X > 5.99) = 0.05$.
7. How do we decide the significance using the critical value or p value? (5pts)
reject H_0 if $\chi^2 > 5.99$ or p-value < 0.05
8. Based on the results do you reject or fail to reject the null hypothesis and how? (5pts)
reject H_0 because $8.4568 > 5.99$ or p-value is 0.0146
9. In one sentence, interpret the findings (i.e., Do you find a relationship between people's political views and their views about the likelihood of current rivalry between China and the US turning into a confrontation resembling the Cold War?) (5pts)
There is sufficient evidence at significance level of 0.05 to conclude that there is a relationship between political view and the opinion of the likelihood of saying conflict akin to the Cold War will occur between China and the US.
10. Provide an interpretation of the Cramer's V (strong, weak or no relationship) on the two variables. (5pts)
It shows a weak relationship between the two variables.

5pts for attempting for the lab