

POS 3713: Homework Assignment #5
 Spring 2001
 Due on Wednesday, April 11th

Instructions: **Type** your answers to the following questions. You are permitted to do any calculations by hand on paper and attach the work to your typed responses. You should, however, report the final results of your calculations in the typed portion of your assignment.

The purpose of this assignment is to introduce you to measures of association for nominal, ordinal, and interval level variables. We will be using the 1996 National Election Study.

Part A: Measures of Association for Nominal Variables (Lambda and Phi)

First, we want to determine the extent to which a person's approval of Congress is influenced by his/her party identification. Both of these variables are measured at the nominal level. The crosstabulation and the calculation of the relevant statistics are presented below.

PARTY ID * CONGRESS APPROVAL Crosstabulation

			CONGRESS APPROVAL		Total
			1. Approve	5. Disapprove	
PARTY ID	1. Democrat	Count	278	340	618
		% within PARTY ID	45.0%	55.0%	100.0%
		% within CONGRESS APPROVAL	38.2%	45.8%	42.0%
	2. Republican	Count	281	162	443
		% within PARTY ID	63.4%	36.6%	100.0%
		% within CONGRESS APPROVAL	38.7%	21.8%	30.1%
	3. Independent	Count	168	241	409
		% within PARTY ID	41.1%	58.9%	100.0%
		% within CONGRESS APPROVAL	23.1%	32.4%	27.8%
Total	Count	727	743	1470	
	% within PARTY ID	49.5%	50.5%	100.0%	
	% within CONGRESS APPROVAL	100.0%	100.0%	100.0%	

Directional Measures

			Value	Asymp. Std. Error ^a	Approx. T ^b	Approx. Sig.
Nominal by Nominal	Lambda	Symmetric	.077	.024	3.095	.002
		PARTY ID Dependent	.004	.028	.127	.899
		CONGRESS APPROVAL Dependent	.164	.026	5.716	.000
	Goodman and Kruskal tau	PARTY ID Dependent	.016	.005		.000 ^c
		CONGRESS APPROVAL Dependent	.035	.009		.000 ^c

- a. Not assuming the null hypothesis.
- b. Using the asymptotic standard error assuming the null hypothesis.
- c. Based on chi-square approximation

Question A1: Examine the relationship between party identification and approval of Congress by comparing the basic percentages of approval and disapproval for each category of party ID in the crosstabulation above (make sure you refer to the percentages in your discussion). Are people who affiliate with certain parties more likely to support Congress than people who affiliate with other parties? Knowing that this survey was conducted in 1996 (hint: Which party controlled Congress in 1996?), do these results make sense to you?

Question A2: Next we want to determine the size and statistical significance of the relationship between party ID and approval of Congress. What is the value for lambda (use the value labeled "Congress Approval Dependent", where congressional approval is the dependent variable); how can you interpret this statistic? Is lambda significantly different from zero? Conduct a hypothesis test by comparing the p-value (Approx. Sig.) to the value of $\alpha = .05$. What conclusions can you draw about the relationship between party identification and approval of Congress?

Question A3: Finally, examine the value of phi (see the output below). Is phi statistically significant? Is this result consistent with what you found in questions 1 and 2?

Symmetric Measures

		Value	Approx. Sig.
Nominal by	Phi	.186	.000
Nominal	Cramer's V	.186	.000
N of Valid Cases		1470	

- a. Not assuming the null hypothesis.
- b. Using the asymptotic standard error assuming the null hypothesis.

Part B: Measures of Association for Ordinal Variables (Gamma and Kendall's tau-b)

Next, we are going to analyze the relationship between ideology and issue positions. In particular, we want to determine how a person's ideology influences their attitudes regarding the importance of defense spending. Both of these variables are measured ordinally. The crosstabulation of these variables is presented below, followed by a table that includes the calculated Kendall's tau-b and gamma.

SUMMARY R LIB-CON SCALE * IMPORTANCE OF DEFENSE SPENDING Crosstabulation

			IMPORTANCE OF DEFENSE SPENDING					Total
			1. Extremely important	2. Very important	3. Somewhat important	4. Not too important	5. Not important	
SUMMARY R LIB-CON SCALE	1. Liberal (1/2/3,0; 0/4/8,1)	Count	90	194	216	43	6	549
		% within SUMMARY R LIB-CON SCALE	16.4%	35.3%	39.3%	7.8%	1.1%	100.0%
		% within IMPORTANCE OF DEFENSE SPENDING	30.2%	30.9%	36.6%	39.4%	27.3%	33.4%
	3. Moderate (0/4/8,3; 4,7/8/9)	Count	21	57	58	12	3	151
		% within SUMMARY R LIB-CON SCALE	13.9%	37.7%	38.4%	7.9%	2.0%	100.0%
		% within IMPORTANCE OF DEFENSE SPENDING	7.0%	9.1%	9.8%	11.0%	13.6%	9.2%
	5. Conservative (5/6/7,0; 0/4/8,2)	Count	187	376	316	54	13	946
		% within SUMMARY R LIB-CON SCALE	19.8%	39.7%	33.4%	5.7%	1.4%	100.0%
		% within IMPORTANCE OF DEFENSE SPENDING	62.8%	60.0%	53.6%	49.5%	59.1%	57.5%
Total		Count	298	627	590	109	22	1646
		% within SUMMARY R LIB-CON SCALE	18.1%	38.1%	35.8%	6.6%	1.3%	100.0%
		% within IMPORTANCE OF DEFENSE SPENDING	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Symmetric Measures

		Value	Asymp. Std. Error ^a	Approx. T ^b	Approx. Sig.
Ordinal by Ordinal	Kendall's tau-b	-.068	.022	-3.085	.002
	Gamma	-.111	.036	-3.085	.002
N of Valid Cases		1646			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Question B1: Examine the relationship between ideology and attitudes about defense spending by comparing the basic percentages of importance of defense spending for each category of ideology in the crosstabulation. Are people who identify as liberals more or less likely to believe that defense spending is important (refer to percentages in the tables for your response)? Are these results consistent with what you expected to find?

Question B2: Next we want to determine the size and statistical significance of the relationship between these variables. What is the value for gamma; how can you interpret this statistic? Is gamma significantly different from zero? Conduct a hypothesis test by comparing the p-value (Approx. Sig.) to the value of $\alpha = .05$.

Question B3: What is the value of tau-b? Is tau-b statistically significant? What conclusions can you draw about the relationship between ideology and attitudes about the importance of defense spending?

Part C: Measures of Association for Interval Variables (Pearson's *r* correlation)

Finally, we want to examine the relationship between respondents' feelings for Bill and Hillary Clinton. To what extent is someone more/less likely to evaluate Hillary Clinton favorably if they evaluate Bill Clinton favorably? In this case, we have two interval measures (the feeling thermometers), so we can examine the correlation (Pearson's *r*) between them. The correlation is calculated in the table below; the table lists both variables in the rows and columns of the table. Thus the correlation between Bill and Hillary's feeling thermometers will be listed twice in the table, once below and once above the diagonal of the matrix, which is where the same-variable correlations equal one.

Correlations

		Clinton thermometer	Hillary Clinton Thermometer
Clinton thermometer	Pearson Correlation	1.000	.822**
	Sig. (2-tailed)	.	.000
	N	1705	1683
Hillary Clinton Thermometer	Pearson Correlation	.822**	1.000
	Sig. (2-tailed)	.000	.
	N	1683	1685

** . Correlation is significant at the 0.01 level (2-tailed).

Question C1: What is the correlation between the feeling thermometer scores for Bill and Hillary Clinton? Is this relationship positive or negative? Explain how to interpret the sign of this correlation in terms of these variables. Is the size of the correlation between these feeling thermometers small or large?

Question C2: Is the correlation statistically significant? Conduct a hypothesis test by comparing the p-value (Approx. Sig.) to the value of $\alpha = .05$.