POLI 300 **PROBLEM SET #12A** 11/30/09

TABLE PERCENTAGING: ANSWERS AND DISCUSSION

General Comment. Many students could have avoided erroneous answers by stopping and thinking whether their proposed answers were even halfway plausible. To take one example, given that Nixon beat McGovern in a historic landslide, is it plausible that he would gotten only 31% of the Independent vote [Q3 (c)]? (He actually got almost 64.2% of it.) To take another example, is it plausible that the vast majority of the population in 1988 was made up of college graduates with "white collar" jobs [Q4 (d)]? (Even today considerably fewer than half of adults have college degrees.)

1. REFERRING TO THE SPSS CROSSTABS OF CHURCH ATTENDANCE BY LEVEL OF EDUCATION (Absolute Frequencies Only)

   (a) 954/3287 or **29.5%** (*column %*)
   (b) 954/4561 or **20.9%** (*row %*)
   (c) 954/16782 or **5.7%** (*total %*)
   (d) (1129 + 1605 + 891 + 1289)/16782 = 4914/16782 = **29.3%** (*sum of total %s*)
   (e) (906 + 954)/4561 = 1860/4561 = **40.8%** *(sum of row %s*)

   (f) ***Note: Not many students answered this well. There was a tendency to look at <u>absolute</u> frequencies in only <u>a few cells</u> (or even just one.) An association between variables pertains to the pattern in the table as a whole (not just particular cells) and is best revealed by column percentages, as shown below.*** The proposition is certainly *not* confirmed by the SETUPS data; if anything the association appears to be *very slightly positive*, rather than negative, as is more readily apparent when column percentages are displayed as below. (***Note***: This result may reflect lack of *validity* in our indicator of RELIGIOSITY.)

TABLE: FREQUENCY OF CHURCH ATTENDANCE BY LEVEL OF EDUCATION

		CHURCH	LEVEL OF EDUCATION			
Code	*Days**	ATTENDANCE	*Not HS Grad*	*HS Grad Only*	*Some College*	*College Grad*
1	52	*Every Week*	26%	27%	28%	30%
2	36	*Almost Every Week*	10%	10%	9%	11%
3	18	*1-2 Times a Month*	15%	16%	20%	17%
4	6	*Few Times a Year*	27%	26%	27%	24%
5	0	*Never*	22%	21%	17%	18%
			100%	100%	101%**	100%
			(*n*=4113)	(*n*=6153)	(*n*=3287)	(*n*=3229)
		Mean code value	3.09	3.04	2.99	2.89
		Mean times per year	21.4	22.1	23.0	24.1

* Approximate number of days per year
** Rounding Error
Source: SETUPS: NES 1972-2000

Following the "vertical strips in a scattergram" approach, let's compute column means. Note that the mean code value decreases very slightly as we more from lower to higher levels of education. Since *lower* code values indicate *more frequent* church attendance (and presumably *higher* religiosity), this means the association is very slightly *positive* (rather negative, as hypothesized). A (possibly) more refined approach is to associate each code value with a central/typical number of days attending church per year (I used the numbers in the "*Days*" column) and then to calculate the (approximate) average number of days of church attendances per year by each category of education. Note that this average also increases with level of education. (If the average numbers of years of education for the four EDUCATION categories are taken as10 for "not a HS grad," 12 for HS grad only," 14 for "some college," and 17 for "college grad or more," church attendance increases on average by about 0.35 days per year for each additional year of education; this is in effect the *regression coefficient* for this relationship.)

2. REFERRING TO THE SPSS CROSSTABS OF PRESIDENTIAL VOTE BY CHANGE IN FINANCIAL CONDITION (Row, Column, and Total Percentages)

(a) 221/568 = **38.9%**
(b) 123/316 = **38.9%**
(c) (330 + 123)/576 = 57.3% +21.4% = **78.6%**
(d) 568/1682 = **33.7%**
(e) 221/518 = **42.7%**
(f) 518/1683 = **30.8%**
(g) (330 + 123)/1683 = 19.6 + 7.3 = **26.9%**
(h) ***Note: Same general comments apply as for #1 (h).*** Though the association is not very strong, the less satisfied voters are with their financial condition, the more likely they are to vote against the incumbent President Bush (cf. sentence #15 in PS #3 and #9).

3. REFERRING TO THE SPSS CROSSTABS OF PRESIDENTIAL VOTE BY PARTY ID IN 1972 (Row, Column, and Total Percentages)

Note. Answers (percentages) for (a) through (e) can be read directly off the table. The answers for (f) and (g) require you to add up several percentages that can be read directly off the table. The answer to (h) must be calculated by you on the basis of the absolute frequencies in the table.

(a) 185/252 = **73.4%**
(b) 474/1580 = **30.0%**
(c) 1014/1580 = **64.2%**
(d) 314/474 = **66.2%**
(e) 160/566 = **28.3%**
(f) (67 + 204)/1014 = 6.6% + 20.1% = **26.7%**
(g) (185 + 192 + 225 + 204)/1580 = 806/1580 = 11.7% + 12.2% + 14.2% + 12.9% = **51.0%**
(h) (67 + 204 + 22 + 7)/(252 + 396 + 247 + 211) = 300/1106 = **27.1%**

4. REFERRING TO THE ABC CROSSTABS OF R'S OCCUPATION BY EDUCATION (Absolute Frequencies Only) ***Note***: The question asked for *adjusted relative frequencies*, so you must remove *missing data* from the fractions.

   (a) 245/(368-20) = 245/348 = **70.4%**
   (b) (54+13)/(354-6) = 67/348 = **19.3%**
   (c) 245/(1775-211-30+2)= 245/1536 = **16.0%**
   (d) (245+75)/(1775-211-30+2)= 320/1536 = **20.8%**
   (e) (87+134)/(289+354-12) = 221/631 = **35.0%**

5. REFERRING TO THE ABC CROSSTABS OF PARTY ID BY FAMILY INCOME (Row, Column, and Total Percentages)

   (a) **11.1%**
   (b) **29.7%**
   (c) 12.4% + 11.0% + 19.9% = **43.3%**
   (d) 7.1% + 7.2% + 9.6% = **23.9%**
   (e) **10.0%**
   (f) **16.4%**
   (g) **1.4%**
   (h) **9.4%**
   (i) 49.3% + 42.6% = 100% - 8.1% = **91.9%**
   (j) You must "recover" the case counts in the relevant cells:
   .173×773 = .493×272 = .083×1618 = 134
   .111×733 = .325×265 = .053×1618 = 86
   .170×683 = .426×272 = .072×1618 = 116
   .228×683 = .589×265 = .096×1618 = 156
   (134+86+116+156)/(272+265) = 492/537 = **91.6%**
   Alternatively and more simply:
   .014×2×1618 = 45
   (272+265-45)/(272+265) = 492/537 = **91.6%**
   Or: (8.3%+5.3%+7.2%+9.6%)/(16.8%+16.4%) = **91.6%**
   (k) **What percent of all Democratic respondents have incomes of less than $10,000?** (Answer: 22.0%)
   (l) **What percent of all respondents with incomes of less than $10,000 are Democrats?** (Answer: 59.4%)

6. Note that the table shows column percentages. But it also shows the number of cases on which the percentages are based (as such a table should), so we can "recover" the original case counts/absolute frequencies, add up row and column totals, and then calculate any percentage.

	IDEOLOGY			
VOTED FOR:	*Liberal*	*Moderate*	*Conservative*	*Total*
Carter	150	300	100	550
Ford	50	200	200	450
Total	200	500	300	1000

Having reconstructed the table in this way, we can readily answer the questions:

1. 50/200 = **25%** (also can be read directly from original table)
2. 300/550 = **54.5%**
3. 200/450 = **44.4%**
4. 550/1000 = **55%**

7. Again let us "recover" the absolute frequencies:

	PARTY IDENTICATION			
VOTING BEHAVIOR:	*Democrat*	*Independent*	*Republican*	*Total*
Democratic	300	40	15	355
Republican	50	60	225	335
Didn't Vote	150	100	60	310
Total	500	200	300	1000

Democrats won the election (in the sample), 355 votes to 335. The total vote (in the sample) is 355 + 335 = 690. Thus the Democratic percent of the vote is 355/690 = **51.45%**.

Note that we can display the information in the table by means of the specially designed bar chart displayed below. (SPSS cannot make such a chart.) The chart is built of like a histogram in that frequencies are represented by areas that add up to 100% (total percentages).