Social Studies 201

Second Midterm Examination

10:30 – 11:20, March 17, 2004

Answer any three (3) of the six question. Each question has equal value.

1. Variability of hours worked. Use the data in Table 1 and the two figures from SPSS below Table 1 for this question.

a. Using the X values and the frequency distribution for those of all ages, obtain the standard deviation of hours worked for respondents of all ages.

b. Using the data next to the figures, obtain the coefficient of relative variation (CRV) for the variation in hours worked for each of the two age groups.

c. Someone argues that the bars are very different height for 35-44 year olds, whereas the bars are of similar height for 15-24 year olds, so the distribution for 15-24 year olds is less varied. Comment.

2. Normal distribution of hours worked? Use the data in Table 1 and the two figures from SPSS below Table 1 for this question.

a. Using the means and standard deviations next to the figures, if the frequency distribution those of (i) aged 15-24 and (ii) aged 35-44 was normally distributed, what would be the proportion of respondents in these age groups who work less than 750 hours?

b. If the distribution of work hours were exactly normally distributed for 35-44 year olds, what would be the percentage working between 1,750 and 2,250 hours?

c. From a. and b. and the two figures, comment on any similarities or differences for each distribution, as compared with a normal distribution.

3. Probability statements.

a. For each of A and B, explain which concept of probability (theoretical, empirical, subjective) is implied by the word in bold (**probably** in A and **likelihood** in B).

b. From quote B, identify (i) one pair of dependent events and (ii) one pair of independent events.

A. Commenting on the new leader of the Saskatchewan Party, Graeme Smith, a columnist for *The Globe and Mail* reports "Mr. Wall did offer some specifics. He'll **probably** announce that he won't sell any Crown corporations, he said."

Source: *The Globe and Mail*, March 15, 2004, p. A7.

B. On average, 16% of employees felt that poor interpersonal relations were a source of stress at work. This compares with about 10% of primary industry workers and 21% of workers in health occupations who feel this way. The **likelihood** of feeling stressed at work as a result of poor interpersonal relationships did not vary significantly from the average in most occupations.

Source: Cara Williams, "Stress at work," *Canadian Social Trends*, No. 70, Autumn 2003, p. 10.

4. Religiosity and volunteer work. The cross-classification of Table 2 gives the number of respondents with each combination of hours of volunteer work and religiosity. If an individual is randomly selected from the set of 975 Saskatchewan respondents, answer the following.

a. What is the probability of selecting an individual who is not very religious or not at all religious?

b. What is the probability of selecting an individual who is not very religious or volunteers for 30 to 99 hours per year?

c. What are the conditional probabilities of selecting an individual who volunteers less than 30 hours (i) given very religious, and (ii) given not at all religious?

d. Are the events (A) volunteering for 100 plus hours and (B) being very religious independent or dependent? Explain.

e. From Table 2 and the above, do the very religious appear to volunteer more than the others? Explain in a sentence or two.

5. Interval estimates of donations. The top panel of Table 3 provides data on annual donations to charitable and religious organizations for Saskatchewan respondents and for all Canadians, classified by religiosity. From these data,

a. Obtain a 90 per cent interval estimate for the true mean amount of annual donations in dollars for all Saskatchewan residents who are very religious.

b. Obtain a 96 per cent interval estimate for the true mean amount of annual donations in dollars for all Saskatchewan residents who are less religious.

c. From the intervals of a. and b., does it appear that Saskatchewan residents are more generous in their volunteer contributions than all Canadians? Explain.

6. Interval estimate and sample size. Use the bottom panel of Table 3 for this question. For ages 45-54 and 55-64, data are from two very small subsamples of Saskatchewan respondents.

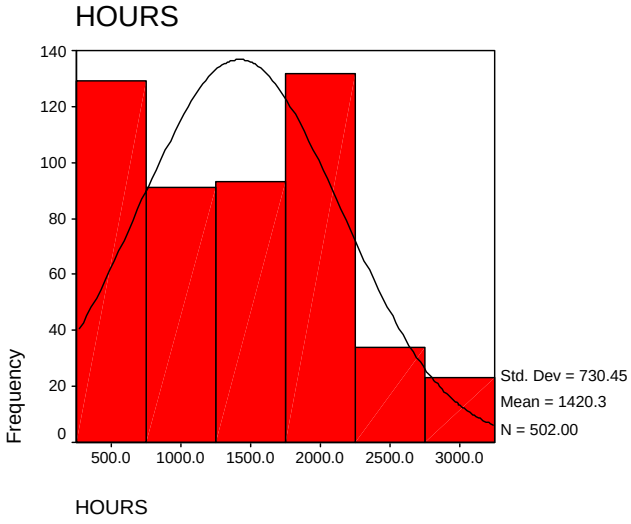
a. Obtain 90 per cent interval estimates for the true mean annual donations for all Saskatchewan residents (i) aged 45-54, and (ii) aged 55-64.

b. How large a sample size would be required to obtain an estimate of the mean annual donations for all Saskatchewan residents aged 45-64, correct to within $25 with 94 per cent confidence?

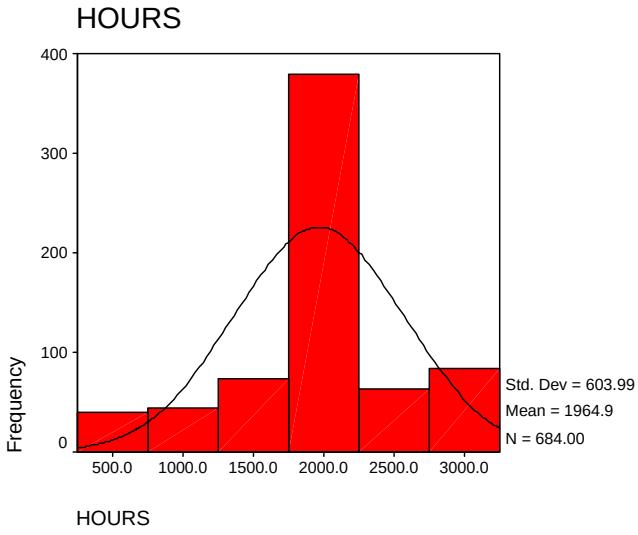
Table 1. Annual hours worked at jobs by Saskatchewan respondents of different ages

Annual hours worked at jobs	X (hours in thousands of hours)	Number of respondents by age		
		All ages	Ages 15-24	Ages 35-44
250-750	0.5	264	129	39
750-1,250	1.0	259	91	44
1,250-1,750	1.5	340	93	74
1,750-2,250	2.0	1,134	132	380
2,250-2,750	2.5	232	34	63
2,750 plus	3.0	257	23	84
Total		2,486	502	684

Ages 15-24



Ages 35-44



Source: Statistics Canada. Survey of Labour and Income Dynamics (SLID), 1999: Person file [machine readable data file]. Release 1 Edition. Ottawa, ON: Statistics Canada. 4/16/2003.

Table 2. Cross-classification of annual hours of volunteer work by religiosity, Saskatchewan respondents. Number with each combination of characteristics

Religiosity	Annual hours of volunteer work			Total
	Less than 30	30 to 99	100 plus	
Very religious	48	43	96	187
Somewhat religious	152	190	212	554
Not very religious	63	47	48	158
Not at all religious	31	21	24	76
Total	294	301	380	975

Table 3. Means, standard deviations, and sample sizes for annual donations by religiosity and age, Saskatchewan and Canada

Characteristics of respondents		Saskatchewan			Canada
		Mean (dollars)	Standard deviation (dollars)	Sample size (n)	Mean (dollars)
Religiosity	Very religious	679	883	218	582
	Less religious	221	475	967	185
	Total	296	587	1,185	239
Age	45-54	251	311	17	
	55-64	112	60	8	

Source: Statistics Canada. National Survey of Giving, Volunteering and Participating, 1997: Main file [machine readable data file]. Ottawa, ON: Statistics Canada. August 20, 1999.