

Social Studies 201

Final Examination

9:00 a.m. – 12:00 noon, Wednesday, April 21, 2004

Answer any three questions – each question has equal value

Note. For each answer, state any assumptions adopted and any confidence or significance levels adopted – note that in some questions you will have to select these levels, since they are not stated in the question. When appropriate, state possible errors involved in your conclusions.

Grades. If you would like the grades for all the problem sets and exams you have completed, send me an email (paul.gingrich@uregina.ca) or put your email address on your examination booklet.

1. Hours worked for Saskatchewan and Canadian adults. The data in Table 1 come from a Statistics Canada sample of Saskatchewan adults who had full-time and full-year jobs. The data refer to annual hours worked at these jobs in 1999.

- Construct a 99% interval estimates for mean annual hours worked at jobs for all Saskatchewan full-time, full-year workers.
- How large a sample size would be required to estimate the true mean hours worked for any group of full-time, full-year workers correct to within plus or minus (i) 50 hours and (ii) 25 hours?
- In 1999, mean hours worked at jobs for Canadian, full-time, full-year male workers was 2,169 hours and for female workers was 1,917 hours. Using data from the sample of adult males and females in Saskatchewan, test whether Saskatchewan workers work more hours at jobs than do Canadian workers.

Table 1. Means, standard deviations, and sample sizes of annual hours worked at jobs, sample of Saskatchewan adults with full-time, full-year jobs, 1999

Sex of adult	Annual hours worked at jobs		Sample size
	Mean	Standard deviation	
Male	2234	683	1002
Female	1975	458	738
Total	2124	611	1,740

Source: Statistics Canada. Survey of Labour and Income Dynamics (SLID), 2000: Person file [machine readable data file]. Ottawa, ON: Statistics Canada. 7/16/2003.

2. Annual wages and salaries. From the same survey as used in question 1, the mean annual wages and salaries of full-time, full-year Canadian workers was \$35,024 in 1999.

- a. From a small sample of eight Saskatchewan adults who worked full-time, full-year in 1999, the annual wages and salaries in thousands of dollars were as follows: 55, 39, 5, 16, 12, 22, 58, and 49. Calculate the mean and standard deviation for this sample. Use these data to test the claim that Saskatchewan workers are paid less than their Canadian counterparts.
- b. A larger sample of 1,746 Saskatchewan adults is taken and the mean wages and salaries are \$30,356, with a standard deviation of \$23,631. Test whether this provides sufficient evidence to conclude that Saskatchewan workers have lower wages and salaries than their Canadian counterparts.
- c. Compare the results of a. and b., commenting on any possible errors in your conclusions.

Introduction to questions 3 and 4. On March 30 and April 1, 2004, the Ipsos-Reid market research and public opinion polling firm telephoned a randomly selected sample of 1,057 adult Canadians. Respondents were asked whether they agreed or disagreed with the statement, “The Canadian federal government should not sell all its shares in PetroCanada as recently announced, but rather it should continue to have part ownership of PetroCanada because it is important to maintain Canadian ownership and influence to ensure Canada’s energy security in the future.” Ipsos-Reid reported “Canadians want continued government ownership of PetroCanada. Some of the results of the poll are presented in Table 2. Use this table for questions 3 and 4.

Table 2. Per cents and sample sizes for Canadian and Saskatchewan/Manitoba respondents expressing each view concerning not selling PetroCanada.

View on not selling PetroCanada	Per cent of respondents with each view	
	Canada	Saskatchewan/Manitoba
Strongly agree	47%	34%
Somewhat agree	26%	34%
Somewhat disagree	11%	15%
Strongly disagree	13%	12%
Don’t know/undecided	3%	5%
Total	100%	100%
Sample size	1,057	100

Source: <http://www.ipsos-na.com/news/pressrelease.cfm?id=2122>, obtained April 18, 2004.

3. Views on federal government ownership of PetroCanada.

- a. Using the data in Table 2, obtain 97% interval estimates for the true proportion of all (i) Canadian adults and (ii) Saskatchewan/Manitoba adults who agree (strongly or somewhat) that PetroCanada should not be sold.
- b. Ipsos-Reid reports “Three-quarters of Canadians do not think that the federal government should sell all of its PetroCanada shares.” Test whether adults in Saskatchewan and Manitoba express less agreement with not selling PetroCanada than do their counterparts across Canada as a whole.
- c. From a. and b., and Table 2, comment on any differences between the results for Saskatchewan/Manitoba and Canada.

4. Sample size for opinion polls. Ipsos-Reid states “With a sample of this size, the results are considered accurate to within ± 3.1 percentage points, 19 times out of 20, of what they would have been had the entire adult Canadian population been polled. The margin of error will be larger within regions and for other sub-groupings of the survey population.”

- a. Verify the plus or minus 3.1 percentage points. Show your work. What is the comparable margin for Saskatchewan/Manitoba?
- b. How large a sample size would be required to obtain an estimate of the true proportion of adults in Saskatchewan/Manitoba who agree that PetroCanada should be sold – to within plus or minus (i) four percentage points and (ii) two percentage points, eighteen times in twenty?
- c. The opinions in Table 2 could be coded on a four-point scale (similar to that of Table 3). How large a sample size would be required to estimate the true mean opinion on this four point scale, correct to within plus or minus 0.2 points, 49 times out of 50.

5. Importance of religion. The data in Table 3 come from a 2000-2001 study, by Paul Eid, of the importance of religion in the lives of young, second-generation Christian and Muslim Arabs in Montreal. In order to obtain average levels, the importance variable is scored from 1, for not important, to 4, indicating very important.

- a. Test whether the mean importance of religion exceeds 3 (important) for either group.
- b. Obtain the 99% interval estimate for the mean importance of religion for Montreal Muslim Arabs.
- c. From Table 3, briefly explain why the standard deviation is greater for Muslim than Christian Arabs. (Do not recalculate but attempt to explain from the data in the table).
- d. Eid comments, “the great majority of this sample consider religion to be an important part of their life.” Comment using the results of a. and b., and Table 3.

Table 3. Statistics of importance of religion in their life, Christian and Muslim Arab respondents. Per cents, sample sizes, means, and standard deviations.

Importance of religion in life of respondent	Per cent of respondents	
	Christian	Muslim
Not important (1)	4.3	9.2
Not very important (2)	11.7	9.2
Important (3)	29.6	32.2
Very important (4)	54.4	49.4
Total	100.0	100.0
Sample size	162	88
Mean importance	3.341	3.218
Standard deviation of importance	0.847	0.952

Source: Table 3 and p. 41 of Paul Eid, “The Interplay between Ethnicity, Religion, and Gender among Second-Generation Christian and Muslim Arabs in Montreal,” *Canadian Ethnic Studies*, XXXV, No. 2, 2003, pp. 30-60.

6. Food bank users in Toronto. The data in Tables 4 and 5 come from a study, by Joseph H. Michalski, of food bank users in the greater Toronto area in the 1990s. Education levels of users are reported in the rows of Table 4 and the columns refer to the time period when respondents used food banks, either the early 1990s (1990-1995) or the later 1990s (1995-2000). Michalski comments “The evidence further reveals that those accessing food banks in the later 1990s were better educated than previously, with more than 35% having attended at least some college or university, including 11.5% who were university graduates.”

- Check Michalski’s percentages and obtain 95% interval estimates for the proportion of late 1990s users (i) who had at least some college or university (rows 4, 5, and 6 of Table 4) and (ii) who were university graduates (row 6 of Table 4).
- Using Tables 4 and 5, comment on the relationships between education level of users across the two time periods. (For the chi-square test, state the assumptions and conclusions).
- From a. and b., and Tables 4 and 5, write a short note commenting on Michalski’s statement and the education levels of food bank users in the two time periods.

Table 4. Number of users of food banks cross-classified by time period and education level. Counts and expected counts from SPSS.

EDUC * TIME Crosstabulation					
			TIME		Total
			1 1990-1995	2 1996-2000	
EDUC	1 grade 8 or less	Count	497	429	926
		Expected Count	409.6	516.4	926.0
	2 some high school	Count	1160	1064	2224
		Expected Count	983.7	1240.3	2224.0
	3 high school	Count	563	805	1368
		Expected Count	605.1	762.9	1368.0
	4 some college/univ	Count	309	551	860
		Expected Count	380.4	479.6	860.0
	5 certificate	Count	146	287	433
		Expected Count	191.5	241.5	433.0
	6 degree	Count	135	407	542
		Expected Count	239.7	302.3	542.0
Total	Count	2810	3543	6353	
	Expected Count	2810.0	3543.0	6353.0	

Table 5. Chi-square statistics for data in Table 4 (from SPSS).

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	220.829 ^a	5	.000
Likelihood Ratio	226.108	5	.000
Linear-by-Linear Association	208.579	1	.000
N of Valid Cases	6353		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 191.52.

Source: Tables 1 and 3, and p. 78 of Joseph H. Michalski, “Housing Affordability, Social Policy and Economic Conditions: Food Bank Users in the Greater Toronto Area, 1990-2000,” *Canadian Review of Sociology and Anthropology*, 40:1, February 2003, pp. 65-92.