Social Studies 201 – Fall 2006

Problem Set 3

Due Monday, October 30, 2006

Note: No class on Friday, October 20.

1. Variation in divorce rates. The data in Table 1 come from a Statistics Canada report concerning provincial divorce rates by the 30th wedding anniversary.

> a. Use the data in Table 1 to compute the standard deviation of divorce rates for each of the two groups of provinces. In a sentence or two, explain the relative size of the two standard deviations.
>
> b. In 2003, the combined divorce rate for Nunavut, Yukon, and the North West Territories was 27.6. If these territories were added to the list of five western provinces, would this decrease or increase the standard deviation from what you determined in part a? Either recalculate or explain.

Table 1. Divorce rate per 100 marriages, by the 30th wedding anniversary, eastern and western provinces of Canada, 2003

Eastern provinces	Divorce rate	Western provinces	Divorce rate
Newfoundland and Labrador	17.1	Ontario	37.0
Prince Edward Island	27.3	Manitoba	30.2
Nova Scotia	28.9	Saskatchewan	29.0
New Brunswick	27.6	Alberta	40.0
Quebec	49.7	British Columbia	39.8

Source: Statistics Canada, "Divorces," *The Daily*, March 9, 2005. http://www.statcan.ca/Daily/English/050309/d050309b.htm

2. Ages of mature Saskatchewan singles. Obtain the variance, standard deviation, and coefficient of relative variation of age for each group of mature singles in Table 2. In a sentence or two compare the variation for the two groups.

Table 2. Frequency distribution of ages of mature Saskatchewan singles, those who say they won't marry and those who say they will marry

Age	Frequency of those who say they:	
	Won't marry	Will marry
30-34	9	24
35-39	16	15
40-44	14	14
45-49	12	12
50-54	9	4
Total	60	69

Source: Adapted from Susan Crompton, "Always the bridesmaid: People who don't expect to marry," *Canadian Social Trends*, Summer 2005, Statistics Cnada – Catalogue No. 11-008, p. 4 and Statistics Canada. General Social Survey of Canada (GSS), 2001. Cycle 15: Family History (main file) [machine readable data file]. 6th Edition. Ottawa, ON: Statistics Canada. 7/28/2005.

3. Retirement experiences. From Problem Set 2, although altered a bit, Table 3 gives percentage distributions of income for Saskatchewan respondents aged 45 or more who were retired at the time they were surveyed, classified by their experience with retirement. For each of the two groups of retired respondents obtain the standard deviation and coefficient of relative variation of income. Write a brief note comparing the variability for the two groups.

Table 3. Experience with retirement, Saskatchewan respondents, classified by household income

Household income in thousands of dollars	Percentage of respondents who were:	
	Satisfied with retirement experiences	Not satisfied with retirement experiences
0-20	11	28
20-30	18	20
30-40	16	13
40-60	24	19
60-100	31	20
Total	100	100

Source: Adapted from Grant Schellenberg and Cynthia Silver, "You can't always get what you want: Retirement preferences and experiences," *Canadian Social Trends*, Winter 2004, pp. 2-7.

4. Interpretations of probabilities. Explain which interpretation(s) of probability (classical, frequency, subjective) appears to be used in each of the following.

a. "Regina: Mainly cloudy with snow or rain showers in the morning, light rain in the afternoon with 80% **probability** of precipitation." *The Leader-Post*, October 16, 2006, p. D8.

b. A Statistics Canada report on immigrants to Canada taking Canadian citizenship reports that "the longer newcomers stay in Canada, the more **likely** they are to become citizens." (*The Daily*, March 8, 2005).

c. "We're in the playoffs now, so we have a **chance**. … Ideally you want first place, but primarily you want a **chance** to win that ring." Saskatchewan Roughriders tackle Gene Makowsky, *The Leader-Post*, October 16, 2006, p. C3.

d. In a game of bingo, "a single board has a 0.000797236 **probability** of filling all 4 corners when the 20th number is called." From Durango Bill's bingo probabilities, http://www.durangobill.com/Bingo4CrnrsLtrX.html.

e. In a study of who cares for seniors, Statistics Canada reported "Although these middle-aged caregivers are just as **likely** to be men as women, the women dedicate almost twice as much time to their tasks – 29.6 hours per month, compared with 16.1 hours for men. Working outside the home does not significantly reduce the amount of time middle-aged people spend providing care." (*Canadian Social Trends*, Autumn 2004, p. 2).

5. Computer file. Use the file SSAE98.SAV in the t:\public\students\201 folder for this question. Obtain the results in each part (i) from the computer data set. Answer the (ii) parts on the computer printout or copy the tables to a word for windows file and type the answers in the file.

a. (i) Use *Analyze-Descriptive Statistics-Descriptives* to obtain the mean and standard deviation for the six variables on hours spent at various activities in question 51 (STHOURS to RELHOURS) of the SSAE98 survey questionnaire. Also use *Analyze-Descriptive Statistics-Frequencies* to obtain the quartiles for these six variables (you could suppress the frequency distribution tables by clicking off "Display frequency tables" on the window where you select the variables). (ii) From these statistics, calculate the range, interquartile range, and coefficient of relative variation for each variable. Write a short note comparing the variability of the variables.

b. (i) Use *Analyze-Compare Means-Means* to obtain means and standard deviations for the six variables of part a. (STHOURS to RELHOURS) classified by whether or not the respondent had a job (JOB). Using the same procedure, also obtain the means and standard deviations of study and extracurricular hours classified by year of program (YEAR).   (ii) Write a note describing and comparing the results from these statistics.

c. (i) Obtain the mean and standard deviation of the variable "respect for government" (RESPECCTG) classified by provincial political preference (use PV, at the end of the data file).   Then obtain a crosstabulation (*Analyze-Descriptive Statistics-Crosstabs*) to obtain the cross-classification of respect for government by provincial political preference.   When requesting this procedure, you may wish to obtain cell or row percentages to help interpret the table.   (ii) Write a short description of what the two tables illustrate about differences in respect for governments among those of different political preference.   Also, from the cross-classification table, what are the following probabilities:

- Probability of selecting a Conservative supporter.

- Probability of selecting someone with moderate or great respect for government (ie. categories 4 or 5).

- Probability of selecting someone who supports no political party and has no respect for government.

- The conditional probability of no respect given support for Liberals. Given support for none of the parties. Explain whether these respective probabilities seem consistent with the different mean respect for Liberal supporters and those who support no political party?