

Social Studies 201
Winter 2005
Answers to Problem Set No. 1

January 24, 2005

1. Some issues and questions about the article are as follows. These are not comprehensive and you may have identified other issues.
 - (a) The headline of the article seems misleading or overstated, given that municipal property taxes are \$405 less in Regina than the average in 24 cities, and overall taxes are only \$19 above the average of \$2,265.
 - (b) The article seems to switch terms several times, making the discussion confusing. Municipal property taxes are referred to as municipal taxes, property taxes, local taxes, and the municipal share of taxes. Education taxes appear to be treated consistently.
 - (c) The statement about the extent to which education costs are covered by property taxes (second last paragraph) is also confusing, given the different terms used concerning taxes. This seems to be 60 per cent of the total property tax, but it is not clear why the comparison is with property tax as a whole and not the education component of taxes.
 - (d) One issue that is not too clear from the article is whether the averages cited are averages of taxes actually paid or averages for on a hypothetical 25 year-old, detached three bedroom bungalow.
 - (e) It would be helpful to know more about the comparisons, for example, what are the highs and lows across the country and what cities are being compared. Some of this information is available on the web site noted in the problem set.
 - (f) It would also be helpful to know what concept of average is being used – presumably the term “average” refers to mean taxes, but it might refer to median taxes.
 - (g) More information about the level of provincial government funding for education would also be helpful.

In summary, it would have been preferable to use consistent terms throughout. One suggestion I'd have is to present a summary table in the article, perhaps giving the highs, lows, and averages across the country, along with the averages for Regina and Saskatoon.

2. **Question.** Use the questionnaire of the *Survey of Student Attitudes and Experiences Fall 1998* for this question. For each of questions 4, 13, 18, 23, and 53 in the questionnaire, (i) clearly identify or name the variable in the question. (ii) For each variable state the highest level of measurement the variable has (nominal, ordinal, interval, ratio), explaining your reasoning, and (iii) for each variable, explain whether it is discrete or continuous.

Answer.

- **Question 4.** The first part is whether the respondent has children or not. This variable is nominal and discrete.

The variable in the second part of the question is **number of children**, a **discrete** variable since each child is distinct and separate from other children and the number of children can be counted. This variable has an **interval** scale since each child counts as one child (unit of one child). It also has a **ratio** scale since the zero point of no children represents none at all, and ratios of numbers of children are meaningful ratios.

- **Question 13.** The variable is **priority for use of federal surplus**. This variable has a **nominal** scale, since this is a classification of possible uses for the surplus but uses are not ordered, they are just different uses. The variable is **discrete** since the possible uses for the surplus are distinct and can be counted.
- **Question 18.** The variable is **future well-being** and is measured at the **ordinal** level of measurement, since respondents are asked to provide answers on an ordered 1-3 scale, with 1 indicating better off, 2 indicating about the same, and 3 indicating worse off. There is no well-defined unit of measure for future well-being and differences between values are not meaningful, so it does not have an interval level of measurement. In theory, this variable could be **continuous** since this is a gradation from better off to worse off.

However, the questionnaire provides only three possible response categories so this variable has a **discrete** set of responses.

- **Question 23.** This variable is **extent of knowledge concerning computing**. For this question, this variable is measured at the **ordinal** level – from a self-evaluation that the respondent is very knowledgeable to a self-evaluation that the respondent is not at all knowledgeable. A unit of knowledgeability would be difficult to define, so this variable does not have an interval scale of measurement. Potentially this could be measured as a **continuous** variable, although in this question there is only a countable number of possible responses (four), so the set of possible responses is **discrete**.
 - **Question 53.** The variable is **hours spent working at the job**. This is a measurement in hours, a well-defined and invariable unit, so the scale is **interval**. Since zero hours means no hours at all, this variable also has a **ratio** scale. Hours can be measured on a **continuous** scale, since time flows continuously and the hours worked could be any value from zero hours to the maximum possible hours worked.
3. Parts (i)-(iii). The unordered and ordered stem-and-leaf displays are in Tables 1 through 4, and the frequency distribution tables in Table 5 and 6. When preparing the unordered stem-and-leaf displays from the data in Tables 1a and 1b of Problem Set 1, I proceeded down the first column, then down the second column, and so on. If you proceeded by rows, then the unordered stem-and-leaf display will be different, but the ordered stem-and-leaf display is the same as in Tables 2 and 4.
- Part (iv). The two distributions have a similar range of ages, from around 15 or 16 (or 10-19) to the high 70s or mid 80s. But the distributions of ages between these limits is quite different. From Table 5, the employed tend to be primarily in the ages between 20 and 69, with by far the greatest number between ages 30 and 39. There is also a considerable number of respondents at ages 20-29 and 40-49. In contrast, those who have never worked in the labour force tend to be very young adults or relatively older adults, with few in between. One-half of these forty individuals are under age thirty (thirteen aged

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The sample of employed individuals is thus concentrated near the centre of the distribution of ages while the sample of those who have never worked is concentrated at the lower and upper ends of the distribution of ages.

Table 5: Frequency distribution table of ages for individuals who were employed

Age (X)	f
10-19	2
20-29	7
30-39	19
40-49	9
50-59	6
60-69	6
70-79	1
Total	50

Table 6: Frequency distribution table of ages for individuals who never worked in the labour force

Age (X)	f
10-19	13
20-29	7
30-39	3
40-49	1
50-59	0
60-69	7
70-79	5
80-89	4
Total	40