**Figure 2.2c. SURVEY SAMPLING: Introductory Case Study 2**

In statistics teaching, articles dealing with a variety of interesting topics from the media are a convenient way of providing *context*, which makes it easier to appreciate the *statistical* issue(s) under consideration. After class discussion of an article is complete, students can test their progress in the course by using their newly-acquired statistical knowledge as a basis on which to make their *own* assessment, if they wish to do so, about the *subject matter* of the article which provides the context.

**EM9511: The Globe and Mail, April 21, 1995, pages A1, A10**

# Sovereignty a winner, poll finds, if Quebec gets link to Canada

## Prospect of association pushes support to 53 per cent

**BY HUGH WINSOR**
**Parliamentary Bureau**

OTTAWA – A majority of Quebeckers would vote for sovereignty in a referendum if it was coupled with an economic association with Canada, according to the latest poll conducted by Groupe Léger & Léger for *The Globe and Mail* and *Le Journal de Montréal.*

The poll, the first taken in Quebec after Bloc Québécois Leader Lucien Bouchard called for a sharp turn (*virage*) in the Quebec sovereigntists' strategy to include links with the rest of Canada, shows that a promise of an economic association would increase sovereigntist support by almost nine percentage points, from a minority to a majority position.

When Quebeckers were asked the simpler question, whether they favoured sovereignty, the support levels were unchanged from previous polls.

If the referendum question was sovereignty combined with economic association, 53.1 per cent would vote Yes, while 46.9 per cent would say No. On sovereignty alone, only 44.3 per cent would say Yes, compared with 55.7 per cent who would say No. In both cases, undecided voters have been removed and the numbers reapportioned according to a formula based on the responses to other questions in the poll.

While the new survey indicates the attractiveness of the sovereignty-association concept, especially among francophones, the actual results could be closer, since the margin of error was approximately plus or minus four percentage points.

Jean-Marc Léger, director of the poll, said the results mean that Quebeckers want to be guaranteed an economic association before they take a chance on sovereignty. But he also urged caution, suggesting there was an initial "rainbow effect."

Mr. Léger said that support for sovereignty-association could be expected to decline as respondents become more familiar with it.

### Léger & Léger/Journal de Montréal/Globe and Mail Poll

The results are based on a telephone survey of 1,002 randomly selected Quebeckers begun on Thursday of last week. A survey with a sample of this size would normally have a margin or error of 3.1 percentage points, 19 times out of 20. But on the questions about sovereignty and sovereignty-association, the sample was divided, with half of the respondents asked whether they would vote for or against sovereignty in a referendum and the other half asked about sovereignty-association.

This is a standard polling practice to avoid having the answers to one formulation biasing the responses to the different formulation, but it means the margin of error on both sets of responses is higher because each involves a sampling of half the size.

The actual numbers before the repositioning of undecideds and refusals were as follows: For sovereignty, 38.1 per cent among the whole population (among francophones 44.5 per cent), against sovereignty 49.9 per cent among the whole population (among francophones 43.5 per cent), undecided 7.2 per cent and refusals 4.8 per cent.

On sovereignty-association, 46.2 per cent of the whole population (52 per cent of francophones) would vote Yes in a referendum, 38.3 per cent of the whole population (32.6 per cent of francophones) would vote No, 9.6 per cent were undecided and 5.9 per cent refused to answer.

The survey was taken immediately after the Bloc Québécois convention in Montreal, but it provides only a rough guide to Quebeckers' attitudes toward the dramatic shift proposed by Mr. Bouchard, since the Bloc Québécois Leader talked about both economic and political links with the rest of Canada.

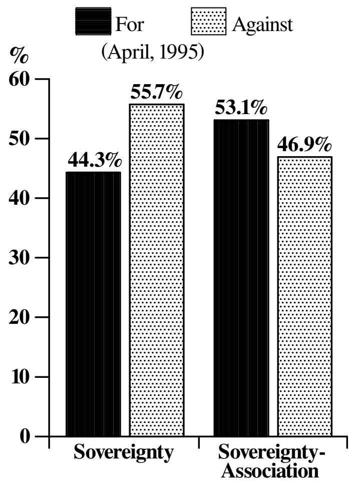
The survey does reaffirm, however, the presence of so-called "soft separatists" who are attracted by the concept of more powers for Quebec as long as there is an economic safety net through ties to the rest of the country.

The survey also showed the Bloc Québécois remains popular in Quebec. Asked how they would vote if a federal election were held today, 49.9 per cent of decided voters would support the Bloc, 38.6 per cent would support the Liberal Party, 5.8 per cent would support the Progressive Conservatives, 3.2 per cent would support the New Democratic Party while less than 1 per cent would vote for the Reform Party.

The survey also showed that the Parti Québécois, at 44.7 per cent of decided voters, would have a six-percentage-point lead over the Quebec Liberal Party in a provincial election, while the Parti Action Démocratique would receive the support of 13.2 per cent of the voters.

The apparent boost that the concept of economic association gives the sovereigntist side could be a short-term effect, Mr. Léger

**Voting intentions**




*Source: Groupe Léger & Léger*



(*continued overleaf*)

said. Sovereignty with an economic and possibly political association with the rest of Canada is currently in the news.

"It's fun, it's different from the proposals by the Parti Québécois", he said, "so they start with a rainbow coalition".

But Mr. Léger said the sovereignty-association proposals of Mr. Bouchard are very similar to the proposal of the late Quebec premier René Levesque in the 1980 Quebec referendum. At that time, support for sovereignty-association was initially very high but dropped to 40 per cent by the time the vote was held.

1 What does the article EM9511 reprinted overleaf on page 2.17 and above indicate (explicitly or implicitly) about the survey with regard to:

- the target population;
- the study population;
- the frame;
- the respondent population;
- the sample;
- response variate(s);
- explanatory variate(s)?
- Does the meaning of the term *sample* as it is used in the article differ from our definition in STAT 332? Explain briefly.
  - What was the *sample size* in the survey?
  - What can be deduced from the article about the number of Quebeckers who were selected but were *not* in the sample? Indicate briefly why this matter is of statistical importance.

2 In the fourth paragraph overleaf on page 2.17, it is stated that the proportion of respondents favouring sovereignty *alone* was 44.3% compared with 53.1% favouring sovereignty *association* but, in the following paragraph, it is stated that ..... *the actual results could be closer.*. What is the probability that this is so? Explain clearly your method of calculation and assumption(s).

3 Describe briefly the important sampling issue implied by the statement at the end of the fourth paragraph overleaf on page 2.17: .... *undecided voters have been removed and the numbers reapportioned according to a formula based on the responses to other questions in the poll.*

- Outline what you infer from this paragraph of the article about how the sample survey dealt with this issue.

4 Assuming that the *1,002 randomly selected Quebecers* (mentioned near the start of the first paragraph of the middle column overleaf on page 2.17) is the number of *respondents* in the sample survey, explain briefly the meaning of the following statement later in the same paragraph: *A survey with a sample of this size would normally have a margin or error of 3.1 percentage points, 19 times out of 20.*

- Show explicitly how the figure of *3.1 percentage points* is obtained.

5 The first and second paragraphs of the middle column overleaf on page 2.17 mention dividing the sample into *halves* which were asked different versions of the key questions. What category of *inaccuracy* was this technique attempting to manage? Explain briefly.

- At the end of the last paragraph of the middle column overleaf on page 2.17, it is stated that ..... *the margin of error on both sets of responses is higher because each involves a sampling of half the size.* Clarify the meaning of this statement by calculating the relevant margin of error.
  - Comment briefly on the result of your calculation compared to the margin of error in the preceding Question 4.

6 Approximately how *many* people in each half of the sample were in each of the three answer categories (*Yes*, *No*, *Other*) for the two versions of the survey key question? Identify explicitly the information from the article you use in your calculations, and set out your answer in an appropriate table.

7 Use the three questions given near the middle of the fourth side (page 2.6) of Figure 2.1 to give a preliminary assessment of the *limitations* of the Answers of the sample survey described in the article reprinted overleaf on page 2.17 and above.

- On which, if any, of the matters covered by the four questions would you like more information to be provided in the article? Justify your answer briefly.

The two articles EM9531 and EM9611 reprinted in the remainder of this Figure 2.2c are also concerned with sample surveys about Quebec sovereignty or separation; they raise statistical issues similar to those from the article EM9511 reprinted overleaf on page 2.17 and above.

(*continued*)

**Figure 2.2c. SURVEY SAMPLING: Introductory Case Study 2 (continued 1)**

**EM9531: The Globe and Mail, September 16, 1995, page A14**

# Reasons unclear for surge of No side

## Liberals say their message about real referendum issue starting to sway public opinion

**BY HUGH WINDSOR**
**Parliamentary Bureau**

OTTAWA – The latest opinion poll published in Quebec gives the No side a significant advance over the Yes forces, but it's unclear how much of the difference between the SOM poll results published yesterday by La Presse and those of Groupe Léger & Léger presented last weekend in *The Globe and Mail* is due to differences in methodology and how much represents actual movement of public opinion.

The SOM poll indicated that 54 per cent of decided voters would vote No and 46 per cent would vote Yes if the Quebec referendum were held now. That compares with the Groupe Léger & Léger finding of a 50-50 split after undecided voters were reallocated into the Yes and No sides.

But the differences in the two pollsters' results to the same question are more pronounced if the actual numbers are compared because SOM and Léger & Léger allocate the undecided or refusal responses in different ways.

The Léger & Léger poll, taken on Sept. 7-8, immediately after the wording of the referendum question was released, found that 44 per cent of respondents would vote Yes, 43 per cent would vote No and 13 per cent were undecided, refused to answer or would not vote.

The SOM poll, which began on Sept. 8 and continued until Sept. 12, found that 37 per cent would vote Yes, 45 per cent would vote No and 18 per cent were undecided, refused to answer or would not vote.

Both polls had about the same sample size, with a margin of error of plus or minus 3.8 per cent, which means that the difference of seven percentage points in the Yes side, while technically just inside the margins, is substantial.

Pierre Paradis, Liberal House Leader, said the poll numbers suggest that the No side's message that separation is the real issue is getting through to the public.

"The more the stakes become clear..... the more people will be inclined to say No," he said in Quebec yesterday.

SOM president André Thérien said the difference between conducting a poll over five days, as his company did, and over 24 hours, as Léger & Léger did, could explain some of the gap.

The SOM results also had a five-percentage-point higher level of undecided respondents, which Mr. Thérien attributed to a difference in methodology.

Mr. Thérien said the differences between his results and those of Léger & Léger follow a well-established pattern in which SOM tends to give the Liberals a higher level of support and the Parti Québécois a lower level than does Léger & Léger. There is a similar pattern relating to support for sovereignty or separation, he added.

Among analysts, SOM has a reputation for volatility. However, during the Quebec election last year, one of its polls came the closest to the election result. But that poll was not printed by SOM's newspaper clients because editors could not believe that the Liberals were doing as well as the SOM poll indicated.

Jean-Marc Léger, president of Groupe Léger & Léger, said yesterday that he believes the No side picked up some momentum during the period the SOM poll was being taken, accounting for part of the difference between the two recent polls.

"The No side was very present immediately after the referendum question was tabled in the National Assembly, both because of [Liberal Leader] Daniel Johnson's response and because of their advertizing campaign," Mr. Léger said.

He added that other polling he has done, but not yet released, tends to confirm some movement toward the No faction, mostly from the undecided category.

However, Mr. Léger said he is skeptical about whether the gap is as wide as the raw numbers in the two polls suggest. He offered some reservations about the SOM sample, especially in the age breakdown.

SOM results indicated that among respondents aged 18 to 24, 45 per cent would vote Yes and 48 per cent No, a reversal of the conventional pattern. According to SOM, the sovereigntists are leading only in the 35-to-44 age group, the baby boomers who gave the Parti Québécois its strongest support in the last referendum, when they were in their radical youth.

"If the SOM results for the 18-to-24 age group are correct, it is the first time in three years that sovereigntists are trailing in this segment," Mr. Léger said. In recent Léger & Léger polls, the youth group has been running about 45 to 35 per cent in favour of the Yes side, with the remainder undecided.

The SOM results are even more surprising, Mr. Léger said, because the poll sample overrepresented French-speaking respondents, a factor that should have favoured the Yes side.

The SOM and Léger & Léger polls are different again from a poll taken by the other major Quebec-based polling firm, CROP, just before the wording of the referendum question was announced. It gave the Yes side 55 per cent and the No side 45 after factoring out those who were undecided or refused to respond.

The article EM9531 reprinted above illustrates, in the context of a political poll (an investigation with a *descriptive* aspect), matters of statistical relevance to this type of data-based investigating; these matters include:

- uncertainty (in Answers) as an unavoidable consequence of incomplete data;
- the possible effect on the poll results and, hence, on the Answer(s) of the methods of dealing with *undecided* respondents and those who *refuse* to respond in the SOM and Léger & Léger polls (left-hand column, second and third paragraphs) – these methods would be specified as part of the Plan stage of the FDEAC cycle;
- the use of the *same* question (one component of the *measuring system*) in the two polls to enhance their comparability (left-hand column, third paragraph);
- the effect of the *timing* of the polls in relation to when the wording of the referendum question was announced (left-hand column, fourth paragraph) – the actual question wording is given overleaf on page 2.20 in Question 13;
- the possible effect of the difference in the *duration* of the data collecting process in the two polls (middle column, fourth paragraph);

(*continued overleaf*)

- a difference of 5 percentage points in the level of undecided respondents between the two polls (middle column, fifth paragraph);
- inaccuracy resulting in over-representation of French-speaking respondents (second-last paragraph);
  - there is not enough information in the article to apportion this inaccuracy among the four sources of studying, non-responding, selecting or measuring – *any* of the four sources could have contributed to it (see Question 11 below).

8 What is the primary *statistical* issue raised by the discussion in the article reprinted overleaf on page 2.19? Explain briefly.
- If you had been a statistical advisor to the writer of the article EM9531, Hugh Windsor, at the point where he had the results of the various polls but had not yet written the article, what point would you make first to him? Explain briefly.

9 The second paragraph of the article EM9531 reprinted overleaf on page 2.19 ends with the statement: *That compares with ..... finding of a 50-50 split after undecided voters were reallocated into the Yes and No sides.*. Describe what you infer from this statement about Groupe Léger & Léger's view of non-respondents to their poll.
- What *other* view of non-respondents can be taken that greatly simplifies the difficulty they pose? Explain briefly.

10 Describe briefly the statistical issue(s), and your understanding of them, raised by each phrase of the paragraph which begins at the bottom of the left-hand column overleaf on page 2.19:
- *about the same sample size*;
- *a margin of error*;
- *plus or minus 3.8 per cent*;
- *the difference of seven percentage points*;
- *technically just inside the margins*;
- *is substantial.*

11 Briefly describe how the over-representation of French-speaking respondents (mentioned in the second-last paragraph of the article EM9531 reprinted overleaf on page 2.19) could be a result of *any* of the sources of the four categories of error – study, non-response, sample or measurement.

12 *The Globe and Mail* of November 19, 1993, on page A30 printed the following brief item:

**Polling the polled**

With millions of Americans being surveyed annually by pollsters, the U.S. research firm ICR – which conducts a weekly national study – decided to ask 1,006 randomly selected respondents why they were responding to questions. The answers (more than one was permitted, so percentages total more than 100):

"I'm a nice person" (about 25 per cent of replies);
"Timing is everything" (20 per cent);
"I'm nosy" (15 per cent);
"You have a lovely voice" (11 per cent).
"It was a great opportunity to share information" (11 per cent);
"I didn't see any harm in it" (11 per cent);
"The questions were so interesting" (11 per cent);
"I've done this myself – I know what you're going through" (10 per cent).

*Source: The Washington Post*

Discuss how the *statistical* issue(s) raised by this item bear on the discussion in the article reprinted overleaf on page 2.19.
- Explain briefly how the issues identified in *this* question differ from that in Question 8 above.

13 On page A1 of *The Globe and Mail* of Friday, September 8, 1995, the following information was provided on the questions used in the two Quebec sovereignty referendums:

**1995:** The official translation of the referendum question on which Quebeckers will vote on Oct. 30 reads:

"Do you agree that Québec should become sovereign, after having made a formal offer to Canada for a new Economic and Political Partnership, within the scope of the Bill respecting the future of Québec and of the agreement signed on June 12, 1995?"

**1980:** The question that Quebeckers voted on in the referendum of May 20, 1980, was:

"The Government of Quebec has made public its proposal to negotiate a new agreement with the rest of Canada, based on the equality of nations; this agreement would enable Quebec to acquire the exclusive power to make its laws, administer its taxes and establish relations abroad – in other words, sovereignty – and at the same time, to maintain with Canada an economic association including a common currency; any change in political status resulting from these negotiations will be submitted to the people through a referendum; on these terms, do you agree to give the Government of Quebec the mandate to negotiate the proposed agreement between Quebec and Canada? *– Staff*

Each question is one component of a *measuring system*; what is the response, and the corresponding population attribute, being measured?
- Outline the statistical issues involved in the use of these measuring instruments in the two referendums – your answer should include *separate* discussion of the two question wordings.

(*continued*)

**Figure 2.2c. SURVEY SAMPLING: Introductory Case Study 2 (continued 2)**

**EM9611: The Globe and Mail, January 27, 1996, pages A1, A8**

# Most Quebeckers expect separation within 10 years

Poll shows sovereignty support strong but focus shifting to jobs

**BY RICHARD MACKIE**
**Quebec Bureau**

MONTREAL – Three in four Quebeckers believe the province will become a sovereign country some day and about 60 per cent expect that the change will occur within 10 years, according to the latest poll by Groupe Léger & Léger.

The poll also found that support for sovereignty continues to enjoy a slight margin over support for staying within Canada: 52.4 per cent of decided voters said they would support the Yes side if a referendum were held today, while 47.6 per cent would vote No.

That is a narrowing of the Yes side's lead from a similar poll two months ago, when support for sovereignty was at 54.8 per cent, compared with 45.2 per cent for the No side.

When Quebeckers voted on the issue in the Oct. 30 referendum, the No side scored a slim victory.

The poll, conducted for *Le Journal de Montréal* and *The Globe and Mail*, also found that:

- Majorities of Quebeckers believe they pay disproportionately high federal taxes and do not receive their fair shares of federal spending or of unemployment insurance payments.
- Quebeckers generally want Lucien Bouchard, who is to become premier Monday, to finish out the mandate of the Parti Québécois and not hold an election until 1998 or 1999. Further, 73.7 per cent want him to emphasize job creation while 24.5 per cent want him to focus on deficit reduction.
- If a provincial election were held soon, the Parti Québécois would win easily under Mr. Bouchard.
- Similarly the sovereigntist Bloc Québécois would dominate a federal election in Quebec and a majority of Quebeckers expect it to survive Mr. Bouchard's departure.
- Far more Quebeckers blame Prime Minister Jean Chrétien than blame Liberal Party Leader Daniel Johnson for the No side's weak referendum victory. However, Quebeckers are split on whether Mr. Johnson should resign.
- The dichotomy that flourishes in Quebec politics is shown by the fact that a majority say they want Mr. Bouchard to quickly negotiate a new constitutional accord with the federal government. At the same time, rather than restarting the debate on sovereignty immediately, almost three-quarters of Quebeckers want Mr. Bouchard to wait until the next referendum.

These results could be explained by the fact that Mr. Bouchard has stated clearly that he plans to deal with economic problems before again becoming embroiled in the constitutional debate, said Michel Simard, vice-president of Groupe Léger & Léger.

There is broad support for the idea of improving the economy, Mr. Simard said. At the same time, Quebeckers want constitutional change and a third referendum sometime in the future because they are not content with the status quo, he said.

The poll, conducted between Jan. 18 and 25, questioned 1,005 eligible voters. A sample of this size is considered accurate within plus or minus 3.1 percentage points, 19 times out of 20.

The widespread expectation that Quebec will become sovereign is important for the whole debate on the province's future, Mr. Simard said. However, he cautioned that the responses to the question are not a prediction and only reflect the expectations of Quebeckers.

When asked "Do you believe that Quebec will become a sovereign country within ...," 2.9 per cent replied within one year; 20.2 per cent said within two or three years; 24.2 per cent answered within four or five years; 14.5 per cent predicted it would be within six to 10 years and 12.0 per cent thought it would take more than 10 years.

Only 21.9 per cent thought Quebec never would become sovereign, while 4.3 per cent did not have a response.

Reasons behind the strength of the sovereignty movement and the expectation that the province will vote Yes someday can be found in the answers to other questions on whether the province is treated fairly.

The degree of feeling that Quebec does not get its fair share out of Confederation shows that "the sentiments on which much of the

## Léger & Léger/Journal de Montréal/Globe and Mail Poll

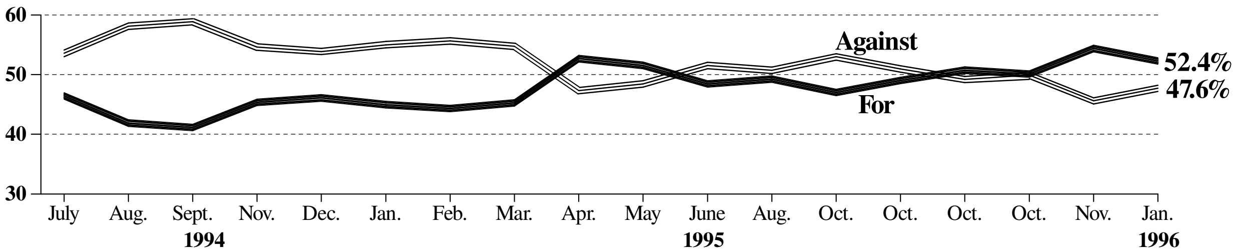
### Sovereignty timetable

*Do you believe that Quebec will become a sovereign country within ....*

| | |
|---|---|
| 1 year | 2.9% |
| 2 or 3 years | 20.2 |
| 4 or 5 years | 24.2 |
| 6 to 10 years | 14.5 |
| More than 10 years | 12.0 |
| Never | 21.9 |
| Don't know/refuse to reply | 4.3 |

*Source: Groupe Léger & Léger*

### Opinions on sovereignty in Quebec




*Source: Groupe Léger & Léger*

sovereignty movement is based have taken firm root in the province," Mr. Simard noted.

One question asked: "According to you, do Quebeckers pay or not pay more taxes to Ottawa than the residents of other provinces?" A total of 50.5 per cent said they pay more, while 34.4 per cent said they don't. Another 14.8 per cent did not know and the rest refused to reply.

Another question was: "According to you, does Quebec receive or not receive less than its share of federal government spending in the provinces?" On this, 50 per cent said Quebec receives less, while 37 per cent said it does not receive less. Another 12.3 per cent did not know and the rest refused to reply.

When asked "Does Quebec receive or not receive less from the unemployment insurance system than it contributes," 41.8 per cent replied it receives less, while 37.3 per cent answered it does not receive less. A further 20.5 per cent did not know and the rest refused to reply.

However, data supplied by Statistics Canada contradict the common beliefs cited in the poll.

In 1993, Ottawa raised $4,107 per capita from Quebeckers and spent $4,286 on programs. In the rest of Canada, it collected $4,962 per person in revenues and spent $4,645. If the cost of servicing the national debt – about $1,325 per person – is considered, the federal government's 1993 deficit worked out to about $1,500 per capita in Quebec and $1,000 per capita in the rest of the country.

Meanwhile, federal taxes and program spending are typically lower in Quebec than the rest of Canada because, in the 1970s, Ottawa handed over to Quebec a chunk of taxing authority that the other provinces didn't want. As a result, Quebec directly raises revenues that are used to finance some programs that in other parts of Canada are financed by Ottawa out of taxes raised in those provinces.

As well, the Statscan data show that federal payments under the unemployment insurance program amounted to $752 per capita in Quebec and $560 per capita in the rest of Canada.

Responses to a fourth question showed less sense of being victimized. It asked: "Do you agree or disagree with the following statement: 'The other provinces control the federal government.'" To this, 43.4 per cent agreed while 52 per cent disagreed and 4.3 per cent said they did not know. The rest refused to reply.

Looking at the Oct. 30 referendum, Quebeckers were critical of Mr. Chrétien's performance. A total of 49.7 per cent said he should be blamed for the No side's weak victory while 29.5 per cent blamed Mr. Johnson. Another 12.7 per cent would blame someone else, while 7.4 per cent said they did not know and the rest had no response.

The question of who should be blamed became an issue when former foreign affairs minister André Ouellet attacked Mr. Johnson in media interviews. Mr. Ouellet was dropped from the cabinet this week as Mr. Chrétien attempts to rebuild his team to face the sovereigntists.

Despite the blame being attributed to Mr. Chrétien, Quebeckers have not warmed to Mr. Johnson. Asked if he should remain leader of the Liberal Party, 45.1 per cent said yes, while 47.4 per cent said no. The rest did not know or did not reply.

But no potential leader did much better when voters were asked hypothetical questions about how they would vote in a provincial election if the Liberals were led by someone other than Mr. Johnson.

In any case, Quebec voters do not want an election soon. Only 9.3 per cent said one should be held this spring. Another 10.3 per cent opted for the fall. Further, 15.1 per cent favoured next year. But 60.8 per cent said Mr. Bouchard's government should serve out the mandate won by the PQ under Premier Jacques Parizeau in September, 1994. The others did not have a response.

If a provincial election were held now, the PQ would be supported by 50.5 per cent of voters while 29.7 would opt for the Liberals. Further, 9.4 per cent would choose the Parti Action Democratique and the rest would favour other parties or have not made a decision.

On the federal scene, where the attempt to strengthen cabinet means two by-elections will be held soon, the Bloc Québécois was supported by 45.9 per cent of those questioned, 29.1 per cent opted for the Liberals, 9.0 per cent backed the Progressive Conservatives, 3.3 per cent cited the New Democratic Party and 1.1 per cent the Reform Party. The rest said they would vote for another party, would spoil their ballot or did not have a response.

The support for the Bloc was emphasized by the fact that 61.4 per cent of those questioned said the party will survive the departure of Mr. Bouchard, who founded it, while 29.8 per cent said it will not.

*With a report from Bruce Little in Toronto.*

14 A matter of statistical interest in the article EM9611 reprinted overleaf on page 2.21 and above is the unusual amount of detail given about the individual questions asked in the poll. Draw up a table, like the one at the upper right overleaf, for *each* of the questions discussed in the article; indicate clearly when you can only *infer* the question wording and separate, where possible, the item non-response categories of *Don't know* and *Refused to respond*.

- Describe briefly the practical difficulties in administering a survey like the one described in the article that arise because Canada has *two* official languages.

15 In the second-last paragraph of the middle column overleaf on page 2.21, the margin of error is given as .....*plus or minus 3.1 percentage points, 19 times out of 20.* Give an explicit calculation that shows the basis of this statement and also explain its meaning.

- Comment critically on the use of this *single* margin of error for *all* the percentages estimated in the poll.
- Comment critically on the use of the word *accuracy* in the description in the article of the margin of error.

16 In the second-last paragraph of the left-hand column above, Statscan per capita revenue data for Quebec and the rest of Canada are given. What is the most important *statistical* difference between these attribute values and the percentages from the poll given elsewhere in the article?

17 Discuss, from the perspective of *graphical excellence*, the pictorial presentation of the time trend of opinions on sovereignty in Quebec at the bottom of the overleaf side (page 2.21) of this Figure 2.2c.