

THE DELAWARE VOTER PREFERENCE SURVEY USING SECONDARY SCHOOL STUDENTS

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ABSTRACT

A voter preference survey was conducted for the 1984 Presidential and Delaware state-wide general elections by the Delaware Chapter of the American Statistical Association and Delaware secondary school students. The survey accurately predicted the results of the elections. It was a valuable educational experience for the 750 students who were taught a unit on sample surveys and especially for the 250 students who participated in the polling. Many chapter members helped with various aspects of the survey including design, distribution, validation, and analysis. The project was so successful that the chapter plans to carry out similar projects in the future.

1. INTRODUCTION AND RATIONALE

The Delaware Voter Preference Survey was a several-pronged project sponsored in 1984 by the Delaware Chapter of the American Statistical Association. The major goals of this project were to provide:

(i) reasonable estimates of how Delaware's electorate would vote in the November 1984 Presidential election as well as in five statewide races;

(ii) as many Delaware secondary school students as possible with some background on both the nature and statistical aspects of polling; and

(iii) a subset of these students with the experience of actually conducting a scientific poll.

The Delaware Chapter decided to participate in a voter preference survey because no surveys, other than those run by the candidates or political parties for their own use, were planned for the 1984 elections. Hence, by coordinating the Delaware Voter Preference Survey, the Delaware Chapter could provide a needed service.

The decision to involve junior high and high school secondary school students and teachers in the survey was an extension of the Delaware Chapter's activities in statistical education in the secondary schools (See Blumberg 1984a). The election was perceived as a fairly painless way of introducing some important statistical concepts into the secondary school curriculum in the State of Delaware. The expectation was that both the teachers and the students involved in the Survey would be enthusiastic about doing it, and that the teachers would agree to teach a small unit concerning both the statistical and nonstatistical

aspects of surveys. The participation of a large number of students would also allow the survey to be completed in a timely fashion and at a reasonable cost.

2. WORKING WITH THE SCHOOLS

On June 19, 1984 a letter was sent to 25 Delaware public school teachers, who from previous contacts were known to be interested in statistics. This letter asked if they would help plan the school-related aspects of the Voter

Preference Survey. Two middle school teachers who had many years of teaching experience volunteered. Table 1 provides a time line of when these and other events took place. On July 12, the authors met with these two teachers to get their input on several issues pertaining to the proposed survey and teaching unit. These issues included format, reading level, statistical and mathematical content, other content, number of days to be devoted to the teaching of the unit, how to work with the teachers, how to work with other school district personnel, and how to recruit teachers. The advice they gave was crucial to success of the project.

Both teachers thought that social studies teachers, rather than mathematics teachers (as had been originally envisioned), probably would teach the unit because, unlike mathematics teachers, they had no State established minimal competency requirements nor district curricula standards towards which they were expected to teach. Furthermore, most social studies teachers already teach units on the electoral process.

Following this meeting, a letter was sent to the Superintendents, School Board Presidents, and Directors of Instruction of the 16 public school districts in Delaware. The letter explained the various aspects of the Survey with the emphasis placed on those aspects which directly involved the students. The letter concluded with a request for permission for teachers and their classes (preferable mathematics or social studies at the eighth to twelfth grade levels) to participate in the Delaware Voter Preference Survey.

In response to the letter and follow-up calls, nine of the districts agreed to participate. Some were extremely enthusiastic and allowed the authors freedom to do whatever was needed. Others were less enthusiastic and placed constraints on their participation. The nine districts included the four largest districts in the State and five of the smaller districts. According to others who have tried to implement projects in the Delaware schools, this is an exceptionally high agreement rate for an experimental curriculum project. In all of the districts the administrators were extremely helpful in finding the individual teachers to teach the unit. Due to a bookkeeping error by the authors, one of the larger districts was not included, and hence only eight districts were involved in the survey. The districts identified 13 teachers from the eighth to twelfth grade levels for participation in the survey. While the Voter Preference Survey teaching unit was originally planned at the eighth grade level, having students and teachers from varying levels was helpful since it gave a broader range of student age and ability levels for the testing of the teaching unit. As predicted, all of the school administrators, except one, allowed only social studies teachers to be involved in teaching the unit.

Each of the thirteen teachers was contacted, the survey background was given, and any questions they had were answered. They were told to call any of the authors any time they needed help and that their input was extremely important. Three

Table 1
Time Line

June 13 -- Project approved by the Delaware Chapter ASA Executive Committee
June 19 -- Letter sent to teachers soliciting help in organizing the survey
July 12 -- Authors met with two teachers to gain their input
Late July -- Letters sent to superintendents, school board presidents, and directors of instruction asking permission to have teachers and students participate in the survey
August and September -- Lining up of individual schools/teachers and writing of student unit
October 3 -- Almost final version of the student unit sent to teachers
October 4 -- Lists of random phone numbers generated
October 8 -- Student units and teacher's guide delivered to teachers
October 12 -- Voter survey forms delivered/mailed to teachers
October 9-17 - The student unit was taught to 750 students by 11 teachers
October 17 -- News-Journal article appeared alerting voters that students might be calling them as part of Voter Preference Survey
October 18-22 -- Students survey voters
October 23-25 -- Survey forms were picked up. Also they were checked for accuracy by several volunteers
October 26-28 -- Survey forms were analyzed
October 29 -- Results disseminated to the media and to the schools
October 28 & 30 -- Results appeared in the media. Also, interviews of student reactions to the project appeared in the media
November 6 -- Date of the general election
November 7-13 -- Various media referenced the Voter Preference Survey when discussing the election results.

of the original 13 teachers decided at this point not to participate but one additional teacher was recruited to replace two of these teachers who were from the same school. Thus a total of 11 teachers participated and taught the unit on polling to approximately 750 students.

3. DEVELOPMENT AND IMPLEMENTATION OF THE TEACHING UNIT

A major part of the work of the survey was the writing of the teaching unit (Lucas and Blumberg 1984). The unit introduced the students to polling, included some survey sampling concepts, and served as the training material for those conducting the survey. Topics covered in the teaching unit included the motivations for polling, the types of questions to be asked, interviewing methods, populations versus samples, sampling error, choosing samples, questionnaire writing, and data analysis. Some coin tossing exercises were included to help the students understand the concept of sampling error and discussion questions were interspersed throughout. For example, the students were given possible interview questions and were then asked to comment on the good and bad aspects of these questions. The final section of the unit provided students with the opportunity to practice using the survey form on fellow students, family and friends before making the survey calls. A copy of the teaching unit can be obtained from the authors. A teacher's guide (Blumberg 1984b) was written to accompany the teaching unit. This teacher's guide included detailed answers to the discussion questions, suggestions for teaching the various subsections of the unit, and one copy of three different student worksheets which could be easily made into dittoes and/or transparencies.

It took two months and five drafts to complete the writing of the unit. The topics to be covered were quickly decided upon, but how to cover these topics took much discussion and thought. The

biggest problem faced was how to help the students see the relevance of statistics in political polling. Further problems were the heterogeneity of reading levels and mathematical skills of the students and the relatively weak mathematical backgrounds of the majority of the teachers. Feedback, however, indicated that the unit was understandable to most students and that most of the teachers found it easy to teach. Several resource materials which were helpful in preparing the teaching unit were Survey Research (Backstrom and Hursh-Cesar 1981), An Introduction to Survey Research and Data Analysis (Weisberg and Bowen 1977), and, "What is a Survey?" (Ferber, Sheatsley, Turner and Waksberg 1980).

The final version of the unit, with a copy for each of the students, was delivered to the teachers only one and one-half weeks before the Survey was to be undertaken, although a preliminary version of the unit (for planning purposes) was given the teachers a few weeks earlier. This put constraints on the teachers in terms of the flexibility they had in weaving the unit into their existing lesson plans. When asked in debriefing interviews about the amount of material taught, teachers said they were able to teach most of the unit because it fit well into their already prepared lesson plans. Many of these teachers already had quite sophisticated lesson plans dealing with elections and several had in past years included lessons on polling and its strengths and weaknesses. Unfortunately, the two parts of the unit that none of the teachers taught were the sections on sampling errors and statistical analysis. The reason most often given was a perceived lack of mathematical competence.

4. QUESTIONNAIRE DESIGN

The questionnaire used by the student interviewers is presented in Appendix A. This questionnaire consists of four parts:

1. An initial screen (questions 1 and 2) which was designed to get a more representative ratio of male to female respondents. This was needed because a woman usually answers the telephone.

2. A screen to identify the most likely voters (questions 3, 4, 5 and 12).

3. Voter preference questions on the five statewide races and the Presidential election (questions 6 through 11).

4. Some basic demographic information (questions 13 through 16).

A question on political affiliation should have been included but was inadvertently omitted. Because the questionnaire was administered by secondary school students with minimal training, the number of questions that could be asked was limited and, to a minor extent, the wording was affected. The final form of the questionnaire was improved from the first draft due to the suggestions of many Delaware chapter members and University of Delaware students who were enrolled in a sampling course. Question 2, which caused problems for the student interviewers, needs to be improved for future surveys.

5. DESIGN OF THE SAMPLE

Before discussing the design of the sample, a short demographic description of the Delaware electorate is needed. The State of Delaware in 1984 had a population of approximately 600,000, of which 314,034 were registered voters (Dennis 1985). Delaware consists of three counties: New Castle, Kent, and Sussex. Two-thirds of the population is in New Castle County, which contains the cities of Wilmington, and Newark, while the remaining third is about evenly divided between Kent and Sussex counties. Except for the city of Wilmington, New Castle County is mostly suburban and occupies the northern fifth of the state. Kent and Sussex counties are mostly rural and occupy the southern four-fifths of the state (Bureau of the Census 1982a).

The target population was Delaware residents who would vote in the general election on November 6, 1984. A telephone survey was chosen because of cost, safety, and time considerations (See Appendix B for a summary of actual costs) and since most adults have telephones.

Once a telephone survey was chosen, the problem was to randomly sample these numbers. One way was to randomly select numbers from the two telephone directories which cover the State of Delaware. The major difficulty with this approach was that over 20 % of telephone numbers are unlisted, especially those of more affluent households (Backstrom and Hursh-Cesar 1981). Ignoring this group could introduce significant sample bias. Hence, it was decided to obtain a random sample from among the working telephone numbers in Delaware. This sample was generated by the Census and Data Systems Center, College of Urban Affairs, University of Delaware. Since only nonworking phone numbers in groups of 1000 (e.g. 562-9999 to 562-0999) could be eliminated, the generated phone numbers contained many nonworking and business numbers in addition to the residential ones. The manager of the Census and Data Systems Center indicated that approximately 25 % of the phone numbers would be working residential numbers (P. Raab, personal communications, October 1984). A

better way of obtaining a representative set of phone numbers is needed in the future since considerable frustration was expressed by students and teachers because of the high percentage of unusable numbers.

Some restrictions were placed upon the design of the sample because:

1. Each student who chose to participate was allowed to do so and was given a list of 40 phone numbers (in the hope of getting at least 10 good responses).

2. The proportion of students being taught the unit in New Castle County was disproportionately low. To compensate for this, a few undergraduate and graduate students from the University of Delaware were enlisted to do some of the telephone calling in New Castle County.

3. Students could not make long distance phone calls.

6. IMPLEMENTATION OF THE SURVEY

The telephone poll survey was conducted between Thursday October 18 and Monday 22 by a subset of the students who were taught the classroom unit. While the telephone calling was optional for the students, most of the teachers gave extra credit or exempted the students from some other homework assignment if the students did the surveying.

A major concern was the credibility of the student pollsters to potential respondents. To help alleviate this problem, the major newspapers serving the State published articles alerting people to the planned survey and explaining that the pollsters were to be students who were doing this as part of a class project. Not unexpectedly, some people still accused students of making "crank calls". Most people, however, responded positively to the students' calls.

As the students were conducting the interviews, they circled the appropriate responses on the survey form (Appendix A) and wrote the phone number on the instruction sheet. The students then brought these materials to class where they penciled in the responses, school code, and phone numbers on the scan sheet portion of the form. To make it easier for the students and to increase accuracy, the instruction sheets and response forms were stapled together. The completed forms were collected from each of the schools later that same day. Approximately 3700 completed forms were turned in. About 75 % of these were eliminated because they corresponded to nonworking or business phones. Others (approximately 2 %) were eliminated because the called party refused to cooperate or did not answer a sufficient number of questions.

7. VALIDATION AND ANALYSIS

The validation phase had the following tasks:

- 1) Checking for internal consistency between the circled responses on the form and the answers coded on the scan sheet;
- 2) Running a scan sheet validation program to catch invalid response codes not detected by the internal consistency check;
- 3) Checking for missing data;
- 4) Making school by school comparisons to check for data faking; and
- 5) Comparing the distributions of age, race, and

sex in the sample with those of the voting age population in Delaware. The internal consistency checks of the forms were performed at three, two-hour work sessions by ASA members and University of Delaware students. This effort required approximately 40 people-hours since each form was checked by two individuals. Pizza and beer were provided as payment to the volunteers. Circled responses on the form were used when in conflict with the scan sheet entries. Coding errors by the secondary school students were minimal (less than 5 % of the questions). This left 869 seemingly valid forms. The resulting voter preference percentages showed no unexpected school by school variation. A

comparison of the distribution of sex, age, and race in the survey with the 1980 voting age population estimates (U.S. Bureau of the Census 1982b) revealed that women and those under 50 year of age were slightly oversampled.

The following screen was used to select the "likely voters" from among those sampled:

'Voted in 1980 presidential election' OR 'Not old enough to vote in 1980' AND

'Registered to vote in the 1984 election' (i.e., responses A or D to Question 3 AND response A to Question 5). The 695 "likely voters" selected by this screen represented 0.22 % of the registered voters of Delaware and 0.27 % of the 254,572 people who voted for President in the 1984 election. The voter preference results were then recomputed, this time using only "likely voter". Of the "likely voter," 59.1 % were women who represented 52.8 % of the population of the state. The results were adjusted to compensate for this bias before being disseminated to the public. (The 1984 general election results for Delaware showed that 53.9 % of those who voted were female (Dennis 1985)). Besides the overall results, the results were broken down by age, sex, race, religious preference, and geographic locations (New Castle county versus Kent and Sussex counties combined).

8. DISSEMINATION OF THE RESULTS

The results of the Delaware Voter Preference Survey were released on October 29. Each teacher received a copy of the overall results of the Survey and the results for those people polled by students at their school. They were told that more detailed analyses were available if they desired them. None of the teachers, however, requested the additional information. Lists of newspapers, radio, and television stations were obtained from the University of Delaware Information Services office and telephone directories. Results were phoned to daily newspapers including those in Wilmington, De., Dover, De., Philadelphia, Pa., and Salisbury, Md. Major radio and television stations serving Delaware were also called. The results of the Delaware Voter Preference Survey were carried in articles in the Wilmington Morning News, Wilmington Evening Journal and the Philadelphia Inquirer. In addition, the authors were contacted by USA Today for further information, and Time magazine referred to the results in their post-election issue dated November 20, 1984. The

Philadelphia ABC and CBS affiliates (WPVI and WCAU, respectively) and a Salisbury television station gave the Survey results on their evening news programs. Major radio stations also announced the results. It is also possible that the results were reported elsewhere. Several of the media stories about the survey included mention of the sponsorship by the Delaware ASA Chapter and reactions by both teachers and students throughout the state who had participated in the Survey.

9. EVALUATION

The evaluation consisted of two parts. The first assessed the accuracy of the survey. The second evaluated the educational benefits to the participating secondary school students. The results of the survey were, except for the U.S. House of Representatives race, in close agreement with the election results (i.e., were accurately predicted to within the sampling error of $\pm 4\%$). In this race, Congressman Carper's margin of victory over Mrs. DuPont was 17 percentage points while the survey predicted only a 0.3 percentage point spread toward Carper. One possible explanation for this difference could be the perceived poor performance by Mrs. DuPont in a televised debate which occurred after the Delaware Voter Preference Survey had been completed (Time Magazine, November 20, 1984).

An evaluation of the teaching unit and of the telephone surveying from the viewpoint of the teachers was conducted by a telephone interview with each of the teachers after the election. These interviews were semi-structured. The interviewer had a pre-set list of questions, but tried to make the interviews more like informal conversations rather than formal interviews. The questions fell into five main categories:

1. students' reactions to the teaching unit
2. students' reactions to the telephone calling
3. teacher's evaluation of the unit, including recommended changes
4. teacher's evaluation of the form used for the telephone calling and
5. recommendations for the future.

According to the teachers, the students liked the unit. Not unexpectedly, those that did the telephone surveying seemed to get more out of the unit than those who only did the classroom portions. The eighth to tenth graders seemed to enjoy the unit more than the eleventh and twelfth graders, but the teachers could not give any clear

explanation as to why. Several teachers also pointed out that some of their slower learning students, as well as some of the shyer students, gained badly needed experience in how to talk to adults and seemed to gain additional self confidence from making the telephone calls.

The major complaint from students and teachers were the abundance of nonworking and nonresidential telephone numbers, that the students were verbally abused by a few of the people they telephoned, and that the lists which were provided to the students in some cases contained long distance telephone numbers. Only one teacher received any parental complaints about the teaching unit or the telephone calling. Given the nature for the modern day school-parent

interaction, the authors were surprised and pleased by the low number of parental complaints.

When asked for suggestions about ways to improve the survey form used by the students, all of the teachers indicated that Questions 1 and 2 were the most confusing. Even though most of the teachers had the students practice the telephone calling on each other, they all commented that the students still had trouble in delivering Questions 1 and 2 in clear and coherent manner. The teacher responses to questions about the teaching unit were surprisingly uniform. Almost all of the teachers complimented the authors on the quality of the unit. Most indicated that the Teacher's Guide was helpful. On the negative side, almost all of the teachers felt that the sections on sampling error and statistical analysis were too hard for the students and most found them impossible to teach because of their own lack of (or perceived lack of) mathematical sophistication. Some excellent suggestions for rewriting these sections as well as suggestions about how to rewrite parts of other sections were made. Many of the teachers also gave the authors ideas for additional topics to include in future versions of the unit. These topics included:

1. History of Polling
2. History of Voting (including such things as women's suffrage, literacy tests, minority rights, and minimum voting age)
3. What polls Are Used For (by politicians and by others)
4. Responsibilities of Voters
5. Comparison of the American Electoral System With Those of Other Countries

The final question that each of the teachers was asked was whether they would use the unit again. All of the teachers, except one, said that they would be very eager to do the unit again, especially in Presidential election years. Most felt it would also be worthwhile doing the unit during the years when there were only Congressional and other state-wide races.

10. CONCLUSION AND RECOMMENDATIONS FOR THE FUTURE

Overall the authors feel that this was an extremely worthwhile project and have tentative plans to initiate similar projects in the future. Even though the survey was conducted with inexperienced and informally trained personnel, most of the survey results were within the sampling error. While this article has indicated many areas where nonstatistical errors could have influenced the survey results, they apparently had little effect (or cancelled each other out). Feedback from teachers and students indicated that this was a worthwhile educational project and although the authors would have liked to have seen the sampling error and statistical analysis portions of the teaching unit taught, the participating students did learn something about the use of statistics in the real world. Further, the students who participated in this project became more aware of the electoral process and developed oral communication skills. The Delaware Chapter of the ASA received good media publicity and further strengthened its cooperative efforts with secondary schools in Delaware. This project had two important side benefits. First it introduced undergraduate and graduate students

studying statistics to the practice of statistics as it relates to public opinion polling. Second, the project furthered camaraderie among the Chapter members who participated.

Many of the aspects of developing and conducting a survey will be much easier next time. A number of issues were raised, however, by the various participants in this project which need to be addressed before initiating future voter preference surveys. First, several changes need to be made in the student unit. The portions on sampling error and statistical analysis need to be rewritten so as to make them more accessible to the students and easier for social studies teachers to teach. Also, some of the additional topics suggested by the teachers in the debriefing interviews should be incorporated into the unit. Second, if possible, more mathematics teachers should be involved. Third, adjustments need to be made in Questions 1 and 2 to make them easier for the student pollsters. Fourth, whether additional questions should be added needs to be decided. Fifth, and most important, a better way must be found to generate the random sample of telephone numbers so that it contains fewer nonworking and nonresidential numbers.

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AUTHORS' FOOTNOTE

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APPENDIX A. QUESTIONNAIRE

- Q1. Including yourself, how many people.. 18 years old or older.. presently are living in your household?
 A. 0 B. 1 C. 2 D. 3 E. 4 or more
- Q2. How many of these adults are Delaware citizens?
 A. 0 B. 1 C. 2 D. 3 E. 4 or more
- Q3. In talking to people about elections, we often find that a lot of people were not able to vote because they were not registered or they were sick or they just didn't have time. How about you--did you happen to vote in the last Presidential election?
 A. YES, DID VOTE
 B. NO, DID NOT VOTE
 C. DON'T KNOW
 D. NOT OLD ENOUGH LAST ELECTION
- Q4. Whom did you vote for in the election for President? (If hesitant, say Reagan, Carter or Anderson).
 A. REAGAN
 B. CARTER
 C. ANDERSON
 D. OTHER
 E. DON'T KNOW
- Q5. Are you now registered to vote in the upcoming election?
 A. YES B. NO C. DON'T KNOW
- Q6. Whom do you prefer in the race for President and Vice President? (If hesitant, say Reagan and Bush or Mondale and Ferraro)
 A. REAGAN-BUSH (REPUBLICAN)
 B. MONDALE-FERRARO (DEMOCRAT)
 C. OTHER
 D. DON'T KNOW
- Q7. Whom do you prefer in the race for Senator? (If hesitant, say Biden or Burris).
 A. BIDEN (DEMOCRAT)
 B. BURRIS (REPUBLICAN)
 C. OTHER
 D. DON'T KNOW
- Q8. Whom do you prefer in the race for the House of Representatives? (If hesitant, say Tom Carper or Elise Du Pont).
 A. CARPER (DEMOCRAT)
 B. DU PONT (REPUBLICAN)
 C. OTHER
 D. DON'T KNOW
- Q9. Whom do you prefer in the race for Governor? (if hesitant, say Castle or Quillen).

- A. CASTLE (REPUBLICAN)
 B. QUILLEN (DEMOCRAT)
 C. OTHER
 D. DON'T KNOW
- Q10. Whom do you prefer in the race for Lt. Governor? (If hesitant, say Robinson or Woo).
 A. ROBINSON (REPUBLICAN)
 B. WOO (DEMOCRAT)
 C. OTHER
 D. DON'T KNOW
- Q11. Whom do you prefer in the race for Insurance Commissioner? (If hesitant, say Elliott or Levinson).
 A. ELLIOTT (REPUBLICAN)
 B. LEVINSON (DEMOCRAT)
 C. OTHER
 D. DON'T KNOW
- Q12. How certain are you to vote in this election. Right now, would you say that you definitely will, probably will, probably will not or definitely will not vote in this election.
 A. DEFINITELY WILL
 B. PROBABLY WILL
 C. PROBABLY WILL NOT
 D. DEFINITELY WILL NOT
- Q13. And what is your age? (If hesitant, say: That is, your age at your last birthday)? (If no answer say: Well, are you in your 20s, 30s, 40s, 50s or what?)
 A. 18-29
 B. 30-39
 C. 40-49
 D. 50-59
 E. 60 AND OLDER
- Q14. And what is your race...how do you classify yourself? (If no responses, say: Most people classify themselves as black, white, oriental, hispanic. How would you classify yourself?)
 A. WHITE
 B. BLACK
 C. ORIENTAL
 D. HISPANIC
 E. OTHER
- Q15. And what is your sex?
 A. MALE
 B. FEMALE
- Q16. What...if any... is your religious preference?
 A. PROTESTANT
 B. CATHOLIC
 C. JEWISH
 D. OTHER
 E. NONE

APPENDIX B. COSTS

Reproduction of 750 teaching units	\$ 370
Printing of 5000 survey forms and instructions	85
Stapling together of surveys and instructions	300
Purchase of 5000 survey instrument forms	217
Generation of telephone numbers	50
Miscellaneous (phone, stamps, etc.)	190
Total Costs	\$1212

The lists of telephone numbers were obtained at a reduced price courtesy of the Census and Data Systems, College of Urban Affairs (the actual cost would have been approximately \$400). There were no computer costs because the analysis was a class project (actual cost for computer time would have been approximately \$100).