THE PRODIGY EXPERIMENT IN USING E-MAIL FOR TRACKING PUBLIC OPINION

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The field of public opinion research has gone through three major periods with respect to the dominant method of data collection, and may now be on the verge of entering a fourth. In the first of these periods, which lasted until the mid 1930's, the primary instrument was the straw poll in which a magazine or newspaper would ask a self-selected sample of their readers to express their opinion by returning self-administered ballots or questionnaires. In the middle 1930's, notorious failures of this method had led to a second, more scientific period, characterized by door-to-door interviewing and area probability samples of the general public. By the early 1960's, sharply increasing costs and declining response rates of door-to-door surveys led to a third period in which the instrument of choice became the telephone survey, conducted from a central location and most often using some form of random digit sampling.

In recent years, telephone surveys have seen a marked increase in costs, along with a sharp decline in response rates, leading many to look for new and more efficient methods for data collection. This, in turn, has led to much speculation on ways of using the emerging "Electronic Highway" as a vehicle for conducting surveys. There remain, however, many issues to be resolved before this approach can be used effectively. In this paper we report the results of a series of experiments in using E-Mail and on-line surveys[1] to measure public opinion, and conducted by the Prodigy Services Company among its subscribers. The primary focus will be on a tracking study of presidential and congressional approval that was conducted continuously from January 1993 through February 1995. We also report on a number of on-line surveys conducted during the presidential election campaign of 1992.

[1] E-Mail surveys are those in which a sample of subscribers is selected and each is sent a questionnaire by electronic mail. On-line surveys are interactive straw polls conducted among a self-selected sample of subscribers who have responded to a public message on the service.

The most significant, and somewhat surprising, conclusion from these experiments is that they produced results which are in many respects comparable to those obtained in national surveys by the major polling organizations.

Who are the Prodigy subscribers?

To begin with, we should describe the population of Prodigy subscribers. Prodigy is one of the major on-line electronic services, with approximately 2,000,000 paid subscribers, of which about 1,600,000 are adults of voting age. Prodigy subscribers represent a very selective segment of the population. Table 1 shows that the adult Prodigy subscribers are more highly educated, with over 50% college graduates compared to 21% in the general public, more politically active, with 92% registered to vote compared to 62% of the general public, and more Republican in political outlook, with over 40% registered Republican compared to 30% of the general public. They are also more likely to be married, male and older than the general public and less likely to be of Hispanic or African American background. And, of course, they all own and use a personal computer and a modem.

How the experiment was conducted.

From January 13, 1993 through February 14, 1995, Prodigy conducted 84 E-Mail surveys tracking subscribers' ratings of presidential and congressional performance. During the first 4 months of the experiment, surveys were mailed every other week; the next 4 months, mailings went out monthly. From September 1993 on, samples were selected and surveys mailed on a weekly basis. Sample sizes for the mailings were designed to collect approximately 6,000 completed surveys each month, or between 1,200 and 1,500 each week. A further design goal was to obtain 2/3 of the returns from respondents who had not been selected for the survey within the past 6 months (Initial respondents), and 1/3 from respondents who had completed the survey 4 weeks previously (Repeaters). With one exception, due to technical problems (11/16/94), each survey obtained usable responses from at least 1,000 subscribers.

For billing purposes, Prodigy maintains a profile for each member ID with their address and, in most instances (over 92%), age and gender information. Members of voting age were grouped into 4 geographic categories, 2 gender categories, and by age into 4 categories for males and 3 for females[2], creating 28 strata from which independent random samples were selected for each survey for both initial respondents and for repeaters, yielding a total of 56 independent random samples for each mailing.

Identical questions were asked in the same order throughout the experiment. After four questions relating to economic issues, respondents were asked to "rate the overall job Bill Clinton is doing as president" using a 4-point scale (Excellent, Pretty Good, Only Fair, Poor), then to "rate the overall job the Congress is doing these days" using the same scale. Finally, they were asked to identify their voter registration (Registered Democrat, Independent/No party affiliation, Registered Republican, Not currently registered). All questions also listed "Not Sure" on screen as an acceptable response.

Surveys collected for each period were matched against the list selected in that week's sample and the last questionnaire filled by a respondent during the period was retained. Those for which either age or gender were unknown were dropped and the remainder weighted to align the marginal proportions for age, gender, region and voter registration with those for the total U.S. population, using a sample balancing program based on Deming's algorithms.

Analyzing the results among Prodigy subscribers.

The accompanying chart shows the weighted percentage of Prodigy respondents rating President Clinton and Congress "Excellent" or "Pretty Good", plotted over time. The solid lines show the trendline obtained using a 2-period moving average. The chart also shows the percentage who approve of the President's performance in the Gallup Organization surveys conducted during the same period, which we will come back to later. For the moment, we will consider only the Prodigy results. and for our analysis, we will divide the chart into two periods, separated by the date of the 1994 elections.

An examination of the pre-1994 election period shows:

- The presidential rating was much higher than the congressional rating throughout.
- The presidential rating was characterized by considerable volatility (varying from a high of 54% to a low of 27%), while the congressional rating was quite stable (varying from a high of 23% to a low of 7%).
- There is no relationship between the changes in the presidential and congressional ratings (the correlation between the changes in the two ratings is .06).
  The presidential rating was on the rise during the month preceding the election, while the congressional rating was on the decline.

An examination the chart after the 1994 congressional elections shows:

- The presidential rating dropped substantially the week of the election while the congressional rating did not change immediately.
- The congressional rating began an upward climb around the beginning of December, 1994, nearly a month after the election, and then soared beginning in January, 1995.

These results do not support the frequently stated hypothesis that the President's low approval rating caused the Republican Congressional victory. Rather, they would seem to suggest the opposite, that the Republican victory lowered the President's rating.

An ARIMA time series analysis confirms the visual analysis described above. Different models fit the presidential and congressional time series prior to the 1994 election: The model for the President is a random walk, while the model for Congress is autoregressive. There is no significant transfer function of effect between the two time series

Nonetheless, there remains some question as to whether these results, obtained from a small and highly selective segment of the population, can be projected to the general public? Surprisingly, there is substantial evidence that we can do so.

Extending the Prodigy E-Mail results to the general public.

[2] Missing age and gender information was assigned using a probability algorithm for sampling purposes, but excluded from the final weighting procedures.

Returning to our chart, this time we will compare the Gallup and Prodigy Presidential approval trend lines. We can see that the absolute level of the two trend lines is not the same, as the Gallup curve displays higher performance scores than the Prodigy curve throughout the entire time period. However, the two curves clearly tell the same story with regard to trends over time. Both surveys show that the President's rating went through four general periods. First a rapid decline in the President's rating in the first six months of 1993, followed by an upward trend until mid-January, 1994, then a slow decline until the fall of 1994, after which his ratings headed up until the week of the 1994 elections. The small differences between the two trend lines can easily be explained by the difference in the timing of the surveys and random fluctuation in each series.

There is some inconclusive evidence suggesting that the Prodigy curve may change a little in advance of the Gallup curve. Notice turning points in the summer of 1993, in January of 1994 and the late summer of 1994, that seem to occur a little earlier in the Prodigy curve.

The results obtained by comparing the Prodigy and Gallup trend lines support the results of earlier experimental studies conducted during the 1992 election campaign by Prodigy and using regular on-line surveys of its subscribers. Stated in its most general form, these results show that surveys of Prodigy subscribers give results which differ from national polls in their absolute level but are similar to national polls in relative measures of public opinion.

Prodigy on-line studies in the 1992 election.

Tables 2, 3 and 4 illustrate some findings from a series of experiments conducted by Prodigy before and during the 1992 general election.

Table 2 shows the results of a Prodigy on-line survey conducted during the last week of October 1992, as compared to eight national studies. Note that the absolute level of vote intention for the two candidates as reported in the Prodigy survey was lower than for any of the national surveys, with 38% for Clinton and 34% for Bush. Note, however that Clinton's margin over Bush of 4% in the Prodigy Survey was in perfect agreement with that in the eight national surveys, which gave a range of 1% to 9% for Clinton's margin.

Table 3 compares results from a Prodigy on-line survey conducted on Oct. 27-28, 1992, with those from a national poll conducted by ORC on the same days as the Prodigy survey. In each, respondents were asked to rate the major candidates on 14 issues. The table shows the difference in the percentage of respondents selecting Clinton minus the percentage selecting Bush on issues. The issues are ranked by the percentage favoring Clinton in the Prodigy on-line survey. Note the similarity of the rankings in the two studies. The Spearman Rank difference correlation between the two ranking is .94.

Finally, table 4 shows results from a Prodigy on-line survey conducted from 9:00 AM to 2:00 PM Eastern Standard Time on Election day in 1992. Respondents were asked to report on how they voted in the presidential election, and the results were weighted to reflect the US population demographically. The Prodigy poll gave Clinton a 6.7% advantage over Bush, which compares quite favorably with his actual 5% margin of victory, and results of most exit polls.

Similar results to those reported in Tables 2 and 3 were obtained in another Prodigy on-line survey conducted earlier in the campaign, and some experiments in weighting on-line poll responses for several high-profile races over the weekend preceding the 1994 election also produced results that compared favorably with many reported by major polling organizations.

Some conclusions.

The results reported above suggest that surveys of Prodigy subscribers, conducted by E-Mail or through on-line polls, and weighted on relevant demographics to match the total U.S. population, give results which are comparable to those obtained in national surveys of the general public on relative measures of presidential popularity or preference. These relative measures include changes over time, candidate selection and the ranking of issues.

This result is very promising for the use of electronic media in studies of public opinion on political matters. It does, however, raise critical questions as to why it is possible to obtain comparable measures of public opinion from probability samples of the general public and of a highly selective and, presumably, non-representative segment of that population, such as the Prodigy subscriber base.

Two possible answers are suggested: The first, which is very optimistic for the future of electronic surveys, is that the Prodigy subscriber base may represent a segment of the public that is more politically involved and who tend to be opinion leaders. If so, a

sample of Prodigy subscribers may be able to tell what the public will think and do earlier than a sample of the general public. The results of the tracking study give some support to this theory.

A second, more pessimistic explanation, is that our current samples of the general public are themselves very highly selective and may in fact be representing the same group of people as the Prodigy samples. Put more bluntly, the segment of the population that we reach through the Prodigy surveys may be no less representative of the general population than that now reached through telephone surveys.

This experiment should be considered a beginning, not an end. Today, only a few service providers such as Prodigy have the ability to reach enough people to collect information in this manner, but, as we move inexorably toward becoming a "Wired" nation, one can expect properly designed on-line surveys to become a major tool for opinion research.

TABLE 1
DEMOGRAPHIC COMPARISON OF PRODIGY SUBSCRIBERS AND U.S. POPULATION

		PRODIGY SERVICE	
	U.S.A.	ON-LINE	ID POOL
GENDER			
MALE	47.8%	77.9%	79.2%
FEMALE	52.2%	21.3%	20.8%
MISSING		.8%	*
AGE			
18-29	26.1%	14.2%	12.6%
30-44	32.2%	38.4%	37.3%
45-64	24.9%	37.9%	39.9%
65+	16.8%	9.3%	10.2%
MISSING		.4%	*
REGION			
EAST	24.3%	22.5%	22.5%
MIDWEST	23.8%	18.7%	18.7%
SOUTH	31.0%	33.0%	33.0%
WEST	20.9%	25.2%	25.8%
MISSING		.4%	*
MARITAL STATUS			
MARRIED	61%	73%	
SINGLE	23%	19%(a)	
DIVORCED	9%	7%(b)	
WIDOWED	7%	2%	
EDUCATION (AGE 25+)			
ELEMENTARY SCHOOL	10%	1%	
1-3 YEARS H.S.	11%	1%	
H.S.GRADUATE	38%	12%	
SOME COLLEGE	18%	29%	
COLLEGE GRAD.	21%	57%	
BLACK	12%(c)	2%	
HISPANIC	9%(c)	6%	
REGISTERED TO VOTE			
YES	62%	95%	
NO & NOT SURE	38%	5%	
PARTY REGISTRATION			
DEMOCRAT	39%(d)	27%(e)	
INDEPENDENT	31%(d)	26%(e)	
REPUBLICAN	30%(d)	47%(e)	

(a)INCLUDES LIVING AS MARRIED (b)INCLUDES SEPARATED
(c)TOTAL POPULATION
(d)GALLUP 1991 ESTIMATE (e)BASED ON REGISTERED RESPONDENTS

TABLE 2
COMPARISON OF PRODIGY POLL TO OTHER PRE-ELECTION POLLS CONDUCTED THE LAST WEEK OF OCTOBER 1992.

Date	Poll	Clinton	Bush	Diff.
10/27-28	PRODIGY ON-LINE SURVEY	38%	34%	4%
10/26-29	GREENBERG-LAKE\TARR.	41%	36%	5%
10/27-28	NBC NEWS/WALL STREET JR.	43%	37%	6%
10/27-28	ABC NEWS TRACKING POLL	44%	35%	9%
10/27-30	GREENBERG-LAKE/TARR.	40%	36%	4%
10/28-29	GALLUP FOR NEWSWEEK	41%	39%	2%
10/28-29	GALLUP/USA TODAY/CNN	41%	40%	1%
10/28-31	GREENBERG-LAKE/TARR.	40%	36%	4%
10/28-11/1	WASHINGTON POST	43%	35%	8%

TABLE 3
THE CANDIDATES ISSUE PREFERENCES: PERCENT CLINTON MINUS PERCENT BUSH - PRODIGY ON-LINE SURVEY AND ORC NATIONAL TELEPHONE SURVEY, OCT 27-28,1992.

ISSUES	PRODIGY	ORC
Q16.CONGRESS	44.1%	24%
Q11.SOLVE PROB.	20.3%	15%
Q13.RALLY PEOPLE	17.0%	15%
Q10.KEY ISSUES	16.4%	14%
Q5. HEALTH	15.5%	18%
Q4. SCHOOLS	15.1%	15%
Q6. JOBS	11.1%	14%
Q3. FED.DEFICIT	1.1%	5%
Q12.FUTURE	0.8%	3%
Q7. SPECIAL INT.	-0.7%	8%
Q8. CUT FED.GOV.	-7.9%	1%
Q14.RISK POP.	-5.9%	-2%
Q9. MORAL LEAD.	-10.8%	-6%
Q15.DIRTY TRICKS	-27.9%	-27%

TABLE 4
THE PRODIGY ELECTION DAY ON-LINE POLL AND ELECTION RESULTS

	--PRODIGY ON-LINE POLL--		ELECTION
VOTE	UNWEIGHTED	WEIGHTED	RESULTS
CLINTON	32.2%	40.9%	43%
BUSH	42.4%	34.2%	38%
PEROT	25.4%	24.9%	19%
TOTAL	100.0%	100.0%	100%
	(6883)	(6883)	
CLINTON-BUSH	-10.2%	6.7%	5%

Comparative Chart: Prodigy Ratings of President and Congress (% Excellent/Pretty Good) and Gallup Presidential Performance (% Approve)