INTERACTIVE POLLING AND AMERICANS' COMFORT LEVEL WITH TECHNOLOGY

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Technological developments have put means of communication in the hands of many Americans, through personal computers, faxes, answering machines, and touch-tone telephones. But survey research moves slowly to adapt technological innovations for its own use. While telephone interviewing is now apparently the major mode of interviewing, it was rejected by many researchers until penetration reached well over 90% of households.

Long before talk of an electronic superhighway, technological access was a factor in politics. In the 1984 California Democratic presidential primary, Gary Hart won the votes of 51% of the one in five primary voters who used a computer at home or work, but only 38% of the vote of those who did not.

This paper addresses two problems of the "new" technology of touch-tone telephones and survey research. The first is availability of and familiarity with touch-tone technology, and the second is the difference between willingness and actual participation in real-time public opinion experiments using touch-tone technology.

OVERVIEW In recent years, some researchers have expected technological developments to offer solutions to methodological problems. The telephone provides easier access to respondents than the personal interview, and computerized interviewing decreases interviewer error and speeds up processing. A computerized survey instrument creates the potential for reducing error further, by eliminating interviewer variability and social desirability biases, and an automated survey allows the respondent, not the keyer or interviewer, to control data entry. These also increase the potential for very rapid data processing.

Surveys using the telephone and a computerized survey instrument can involve computer-generated or recorded voices interacting with the respondent, direct data entry via a touch-tone phone, and automated dialing.

Automated telephone surveys have been proposed as a way of ensuring accurate opinion measurement, and devices for collecting public opinion via touch-tone phones are being marketed. They have the capacity to branch within the survey instrument. Prompts allow forgetful respondents a second chance to enter data. The message can be recorded by a trusted news anchor or reporter. Sometimes, allowance is made to transfer recalcitrant respondents to live human beings.

Michael Havice has written that the automated survey device is more efficient than interviewers collecting more data in a shorter period of time. But even his research notes the lower overall response rate of automated computer interviewing. The percentage of completed interviews (based on all numbers dialed) was 19.3% for a survey conducted by trained, unpaid interviewers and only 2.6% for one conducted by a computer device (Havice, 1989, p. 140; also see Havice, 1990, and Havice and Banks, 1991). He attributes the difference to the standard reasons for survey non-response (lack of time, unwillingness to participate, general disaffection with the system), and not to problems inherent in the technology.

However, automated instruments and dialing raise new problems. Attempts at probability samples using this method cannot account for respondent selection within household or for those unable or unwilling to use these technologies. And we know little about resistance to automation in the survey context.

THE CBS NEWS PROJECTS CBS News undertook several projects in 1992 and 1994 to measure the public's response to major news events: the 1992 and 1994 presidential State of the Union addresses, and the 1992 presidential campaign debates. The projects utilized touch-tone technology to process responses in the minutes immediately following those events, using a nationwide representative sample, appropriately selected and weighted.

In each case, CBS contracted with Call Interactive of Omaha, Nebraska to accept, screen and process calls the day of the event. Call Interactive was capable of handling as many as 5,000 simultaneous calls and of processing responses at 20-second intervals. Data for this report focus on interviews conducted for a reaction poll following Bill Clinton's State of the Union message on January 25, 1994.

Participants were recruited over nine days -- January 7-13 and January 19-20 -- using seven separate random-digit-dial samples. Six of the samples were individuals previously interviewed by CBS, and the seventh was a large sample of never-contacted households. 5,791 adults were interviewed. 3,293 were from the previously interviewed group, 2,498 were first-time respondents.

After a series of questions on general political topics, respondents were told about a special CBS News broadcast that would take place live, after the State of the Union speech (approximately 9:45 PM EST) on Tuesday, January 25. Respondents were told it was not necessary to watch the speech -- only to call in to respond to some questions afterward. Questions would be pre-recorded and answers would be entered in on touch-tone keypads. Those without touch-tone phones would be transferred to a live operator. All respondents were asked to call a free, 800 number to answer some questions after the speech. Touch-tone respondents were asked to call in and spend 30 minutes holding the line.

Touch-tone respondents were given instructions about how the broadcast would proceed: they would first be answering pre-recorded questions using their touch-tone keypad, then (following a short training session) asked questions live during the broadcast which would then be reported within minutes. Rotary phone users were informed that they would call the 800 number and be transferred to a live operator who would ask them several questions. No monetary or other incentives were offered.

In 1992, CBS News's experience with this technology was that a majority of respondents would agree to participate. The 1994 project, however, involved an interactive component and a greater commitment of time. Respondents would be required to keep their phone open for a significant amount of time. A preliminary poll in December, 1993 indicated that 89% of respondents had televisions in the same room as their phones, that 52% watched television and talked on the phone sometimes, and that 60% sometimes spent 45 minutes or more on the phone with close friends or family. Four out of five of those who said they would be willing to participate in a hypothetical poll after a news event said they would be willing to commit half an hour on the phone.

In the January survey, 4,578 (79%) of the 5,791 respondents said they would be willing to call in at 9:45 PM EST on Tuesday, January 25. Reminder calls were made the Sunday and Monday before the State of the Union speech, reconfirming the 800 number and the time and day respondents were to call. (77% of the willing respondents were reached.) Messages were left on answering machines with the necessary information for those not reached.

The night of the broadcast, interviewers monitored a CBS 800 number if respondents had any problems. Approximately 125 problem calls were received -- very few considering the volume of calls.

The Survey Process When respondents called in, there were six basic questions. Live operators administered the questions to rotary users, and touch-tone users answered pre-recorded questions. Rotary phone callers (15% of the unweighted sample) were then also asked two "wild card" questions -- two of the three questions CBS planned to ask touch-tone users live during the interactive broadcast. Touch-tone users responded to the first six questions, entering their close-ended responses on their touch-tone telephone keypads. After these questions, touch-tone callers were led through a practice instruction session to prepare them for the live portion of the CBS News "AMERICA ON THE LINE" broadcast.

Because the President's speech ended 35 minutes later than scheduled, touch-tone callers were asked only one live question during the broadcast. In addition, because of the speech's length, many respondents had to stay on the line much longer than the 30 minutes they had agreed to. The vast majority did.

For the interactive segment, Dan Rather read the question on the air and touch-tone callers still on the line went to their phones to enter their responses. Two minutes later, the tabulated and weighted responses were aired on the broadcast. (Rotary responses to the live question had already been tabulated and were included.) Of the 2,482 touch-tone respondents who answered the first post-speech question, 1,617 registered a response to the live, on air question.

All answers given that night were appended to a data file which had been previously transmitted to Call Interactive. In order to be asked any questions, respondents needed to provide two pieces of personal identification. They were not told ahead of time one of the items that would be asked. Responses were tabulated first by the weights assigned after the January interview,[1] and then dynamically weighted using the original weight to account for non-response and to reflect the pre-broadcast distribution. As seen later in this paper, there were some clear demographic differences in participation.

THE ISSUE OF BIAS Kiesler and Sproull (1986) note that the appropriate population for an electronic survey are those with access to and familiarity with computers, the well-educated, urban, and technologically sophisticated. But the limitations of familiarity extend even to a technology as low-tech as the touch-tone phone. The ability to use touch-tone technology in any form requires near-universal availability and willingness to participate, or at least random distribution of non-availability and lack of willingness.

Identifying Phone Type Near the end of the

CBS News January, 1994 survey discussed above, respondents were asked, "Is the phone you're speaking to me on a touch-tone, push button phone, OR a rotary dial phone?" Since some people own telephones that appear to be push button phones, but actually are pulse or rotary phones, respondents who answered that they had a touch-tone phone were then asked to press the number "ONE" on their phone, and interviewers recorded whether or not they heard a tone.

One out of five respondents was classified as NOT having a touch-tone telephone. A total of 20% of all those interviewed did not produce a tone. Most of that total were people who admitted that they had a rotary phone, but 9% of all respondents said their phones were touch-tone phones but were then unable to produce a tone.

There was a certain amount of misclassification by respondent and interviewer alike. Of the 518 adults in the January survey who had previously been interviewed in December, 8% answered the question of touch-tone ownership differently at the two time points. In 6% of the cases, the respondent answered the question identically at the two time points, but interviewers heard no tone at one time, but did the other time. It is impossible to say how much of that is due to real change in telephone line or instrument, and how much is error. However, classification of phone type was the same in 92% of the cases.

The Rotary Population 20% of the public is a significant minority, and they are not randomly distributed. Table 1 presents the demographic profile of the overall sample and the rotary-dial population. The rotary population is more than twice as likely as the total population to be 65 and older. There is a greater concentration in the Northeast and Midwest than in the South and the West. The rotary dial population is less well-educated and less well-off, and much more rural than the population as a whole.

The relationship of two political variables is intriguing. Perhaps because of the older composition of the rotary population, rotary users are slightly more likely to be registered voters. They are equally likely to pay a lot of attention to politics. That is surprising, since the rotary population is significantly less educated and less well-off than the population as a whole.

Rotary telephones are concentrated in a more stable, but less mobile part of the population, due to age and income. The rotary population may include many individuals who have lived in the same household since before the onset of touch-tone phones and, so far at least, see no reason to change that status. It may be poverty that prevents access to this technology, but it may also simply be inertia.

Table 1: Profile Of Rotary Respondents

Total = 5791   Rotary = 1187

		Total	Rotary
Age:	18-29	26%	14%
	30-44	32	22
	45-64	25	27
	65+	17	36
Educ:	< than HS	22%	34%
	HS grad	39	40
	Some clg	20	14
	Clg grad	19	13
Income:	< than $15K	16%	24%
	$15-$30K	29	32
	$30-$50K	30	24
	$50K+	19	11
Urban:	Rural	29%	41%
	Suburban	37	34
	Med city	25	18
	Lrg city	9	6
Reg:	NEast	24%	31%
	NCentral	24	30
	South	34	29
	West	19	10
Vote:	Registered	77%	80%
	Not registered	22	20
Attn:	A lot to politics	42%	41%
	Not a lot	58	59

Willingness and Comfort Among Touch-Tone Users Even those who possess a touch-tone phone may lack the willingness to use it for more than dialing. In December, 1993, CBS News interviewed a nationwide random sample of 892 adults, and asked the 752 who reported having touch-tone phones whether or not they used their phones for each of six different applications: paging someone, retrieving messages from an answering machine, using voice mail, banking, seeking travel schedules, and sports or weather information[2].

After being asked their use of these touch-tone applications, touch-tone respondents were then asked: "Would you say you feel comfortable using a touch-tone phone for things like this, or do you dislike using your phone for this?"

Overall, 75% of touch-tone users said they were comfortable using the phone in these ways, while 22% disliked using it or said they never used the phone in these ways. As Table 2 demonstrates, there are enormous differences in comfort level among touch-tone owners by age, education, income and residence. The comfort level with the use of a touch-tone phone for these applications exaggerates the bias previously found in Table 1. Older respondents, the less well-off and

well-educated, and the less attentive are less comfortable with touch-tone applications[3].

The six specific questions about actual touch-tone usage were entered into a factor analysis which produced two factors. The first factor incorporated the questions about voice mail, paging, retrieving answering machine messages and banking. The two questions that formed the second factor were the two questions that were about information seeking -- for sports and weather information or for schedules. Since the four questions which loaded on the first factor included the uses to which the phone was most frequently put, respondents were scored on an index indicating the total usage of those four applications. Scores ranged from 0 to 4.

Table 2: Touch-tone Users' Comfort Level With Technology

		Comfortable=489	Not=100
Age:	18-29	89%	8%
	30-44	77%	15%
	45-64	67%	17%
	65+	44%	32%
Educ:	<than HS	63%	27%
	HS grad	74%	12%
	Some clg	75%	18%
	Clg grad	83%	10%
Income:	< than $15K	60%	26%
	$15-$30K	68%	20%
	$30-$50K	78%	13%
	$50K+	84%	10%
Urban:	Rural	65%	18%
	Suburban	76%	16%
	Med city	76%	15%
	Lrg city	89%	6%
Clinton:	Approve	76%	14%
	Disapprove	74%	17%
Vote:	Registered	72%	16%
	Not registered	82%	12%
Attn:	A lot to politics	77%	10%
	Not a lot	72%	18%
Tekkies*:	0 of 4	50%	30%
	1 of 4	63%	18%
	2 of 4	78%	14%
	3 of 4	91%	7%
	4 of 4	91%	9%

*Scale based on whether respondent has ever used a touch-tone phone to do banking, use a beeper, retrieve messages from an answering machine, and voice mail. Base=respondents who answered these questions in 12/93 and were re-contacted in 1/94.

Comfort is closely related to actual use. Touch-tone users who said they were comfortable using their phone for non-dialing uses had a mean score of 2.1 out of 4.0 on the uses index, renamed the "tekkie" index. Those who reported they were uncomfortable users had a mean score only half as high -- 1.05.

THE ISSUE OF PARTICIPATION More than three-quarters of all those interviewed in January, 1994 agreed to participate in the post-State of the Union poll. However, on the night of the speech, only 2,899 called the 800 number and successfully passed the screen to answer questions in the interactive format.

Participation required two levels of commitment: first, agreement to participate, and second, placing the call at the appropriate time. In addition, respondents had to successfully navigate the screening procedure. Having respondents dial the call themselves certainly placed an added burden on them, but it allowed respondents to call from wherever they happened to be the night of the State of the Union address, and it gave CBS News some control over who was at the respondent's end of the telephone.

Willingness to Participate Table 3 presents the characteristics of those who agreed to participate, and those who actually participated. Demographically, the pattern of willingness replicates that of access and comfort, with older, less-educated, and less well-off respondents the least likely to agree to participate.

Politically, while there were few differences in willingness between Republicans and Democrats, and between Clinton supporters and detractors, there were large differences between those interested in politics and those not interested. 87% of those who said they paid a lot of attention to politics said they would be willing to participate, while only 72% of those who paid less attention said they would. Similarly, 86% of those who said they were very likely to watch the State of the Union message said they would participate, while only 71% of those who were not very likely said they would participate. Registered voters were also more willing.

Technological differences were also found. 82% of those with touch-tone phones said they were willing; only 66% of those with rotary phones were willing. Among touch-tone users, the more often people used their phones for other than dialing purposes, the more willing they were to participate.

Actual Participation The relationship of these same variables to actual participation was quite different. The pattern duplicates the pattern of characteristics normally associated with non-response and non-completion.(Groves, 1989) As seen in Table 3, the greatest levels of drop-off from willingness to actual participation came in the youngest age group, among non-whites, and in urban areas.

Table 3: Willing And Actual Participants

		Willing=4578	Called in=2899
Age:	18-29	78%	38%
	30-44	85%	54%
	45-64	83%	59%
	65+	64%	40%
Educ:	< than HS	62%	25%
	HS grad	76%	44%
	Some clg	82%	53%
	Clg grad	86%	64%
Income:	< than $15K	68%	33%
	$15-$30K	77%	44%
	$30-$50K	83%	55%
	$50K+	87%	64%
Urban:	Rural	77%	48%
	Suburban	80%	53%
	Med city	80%	50%
	Lrg city	79%	43%
Reg:	NEast	79%	50%
	NCentral	77%	51%
	South	79%	49%
	West	82%	52%
Race:	White	79%	53%
	Non-white	77%	33%
Attn:	A lot to politics	87%	60%
	Not a lot	72%	41%
Clinton:	Approve	81%	50%
	Disapprove	81%	54%
Party:	Republican	81%	57%
	Democrat	79%	46%
	Independent	77%	48%
Phone:	Touch-tone	82%	53%
	Rotary-dial	66%	39%
Vote:	Registered	81%	53%
	Not registered	71%	34%
Tekkies:	0 of 4	72%	45%
	1 of 4	75%	47%
	2 of 4	85%	63%
	3 of 4	94%	69%
	4 of 4	92%	72%

However, the relationships between education and income and participation, seen in the prior analyses, also continued, suggesting two explanations for the fall-off in participation. First, the low level of participation by the youngest age group raises questions of availability; second, the drop-off among non-whites raises concern about some respondents giving -- at least at first request -- what they believe are socially desirable answers. Later, when acquiescence is tested, they may bypass the original agreement.

Politically, the largest fall-off in actual participation from willingness was between registered and unregistered respondents. There was a smaller disparity in the fall-off between the attentive and the non-attentive. There was a small difference between those who approved and those who disapproved of Bill Clinton's performance as President, with those who disapproved more likely to participate. This may be an effect of the higher levels of education and income among the active participants, not of Clinton haters being more likely to watch him speak.

The difference between touch-tone and rotary callers actually decreased from the time of commitment to the time of calling. This may be an artifact of the severe drop-off of younger, urban participants.

Technological proficiency continued to have its effect. The crosstabulation by the "tekkie index" (applied only to touch-tone respondents interviewed both in December and January), showed both less willingness and less participation among those who used less technology than among those who used more.

Gauging Non-Participation What is difficult to assess in the evaluation of actual participation is how much of the fall-off is due to forgetfulness and hidden unwillingness, and how much is due to the difficulties of the procedure. After a similar project following the 1992 State of the Union message, a sample of those who agreed to participate but did not were called. While systematic records were not kept, the majority of those contacted said that they had forgotten, were busy, or wouldn't call-in, not that they were unable to carry out the procedure.

It may be possible to sort out some of these distinctions by examining the group of touch-tone respondents who called in after the 1994 State of the Union message as asked but did not complete the survey. As noted above, only 1,617 of the 2,482 touch-tone users who answered the first post-speech question registered an answer to the first live, interactive question. At least 75 people did not pass the identifiers which preceded the first question, while 199 hung up part of the way through the question series or during the training period for the interactive questions. Another 621 did not wait for the interactive live question or chose not to answer it.

Non-completion of the interactive survey had two components -- the increasing technological difficulty of the assignments involved, and the length of the Clinton speech. Some respondents called while the President was still speaking and then could not or would not stay on the line until the special CBS News broadcast. In addition, entering answers to the live, interactive questions was a moderately difficult process,

and at least some respondents were unable to manage it. Some may have chosen not to.

Those who could not pass the respondent identifiers were disproportionately older, less educated, less well-off, rural and uninterested in politics. The second group, those who had difficulties during the automated survey were also disproportionately older and less educated. This non-response replicates that found on touch-tone ownership and comfort.

The third group, those who dropped out after the training session, but before the on-air question, appears to be much more representative of all touch-tone users. That suggests that, at least in this case, the President's long-windedness affected young and old, supporters and opponents equally. There was no intrinsic hostility to the survey method, merely the impact of inconvenience.

CONCLUSIONS There are two principle conclusions of this research. The first is actually an important reminder -- that sizable groups of individuals lack access to even the simplest levels of technology and that many of those with access have little comfort with or willingness to use that technology. In some cases, the biases inherent in access to technology are exacerbated by the biases of comfort. In other cases, new biases are created. Age is the most visible example of this technophobia: older adults are least likely to have access to a touch-tone telephone, and older adults who have access are the least likely to say they are comfortable using those phones for any other purpose than dialing a phone number. Income and education also matter.

Secondly, there are differences between those who are say they are willing to commit themselves to take action and those who follow through. Again, age provides the best example of this. The oldest group of adults were the least likely to say they would participate in the CBS News reaction poll. However, among those who did agree to participate, the youngest group was the least likely to take part on the night of the event. In the end, response rates of those under 30 and those over 64 were nearly the same.

There were, however, other factors involved in determining actual participation. In some cases, technological proficiency was even more important than age. More important, a respondent's general interest in the political environment was a critical factor in determining participation in what was, after all, a survey conducted after a political event.

Survey research is moving into an era of increasing reliance on new forms of technology, taking advantage of quicker ways of measuring opinion and direct respondent-data base connection. That step

cannot be taken without a clear understanding of the implications of this for accurate measurement. For the time being (and perhaps for a long time), many Americans will find themselves excluded (or choose to exclude themselves) from participation.

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ENDNOTES

1. Respondents who agreed to participate were first given an initial weight proportional to the number of households in their region. Weights of respondents with multiple telephones or more than one adult in the household were adjusted to reflect the probabilities of selection. Those initial weights were modified to adjust for the race by sex distribution of the population, followed by the education, and age distribution. The final weights were then scaled so the sum of respondent weights equaled the actual number of respondents in the sample.

2. The six original questions were: 1) Nowadays, there are many different uses for touch-tone telephones. I'd like to know if you have ever used your touch-tone phone for some of these services. Have you ever used your touch-tone phone to call someone at work and gotten through to a voice mail system, where you have to punch in the person's extension or last name, or you leave them a message on their voice mail? 2) How about to call or page someone on their beeper? 3) Have you ever used a touch-tone phone to do your banking, such as transferring money from one account to another, checking account balances, or getting loan or interest rate information? 4) How about to listen to messages people have left on your home or work answering machine by punching in codes from another touch-tone phone? 5) Have you ever used a touch-tone phone to check bus, plane or train schedules? 6) How about to call information lines to get updates on things such as sports scores and weather forecasts?

When entered into a factor analysis, two factors emerged. The first four questions loaded on the first factor. The "tekkie" score was created by adding "yes" answers to those four questions. Resulting distributions for those who said they had touch-tone phones were: "Tekkie" score: 0=18%; 1=27%; 2=22%; 3=22%; 4=12%

3. While the oldest respondents were only 11% of those identified as touch-tone users who participated in the interactive poll, they were 29% of those identified as touch-tone users during the recruiting period who were transferred to a live operator that night. Some transferred respondents may have been calling from different phones, and some may have been misidentified, but clearly many simply did not want to respond via push button.