

Data Collection Mode Effects Controlling for Sample Origins in a Panel Survey: Telephone versus Internet¹

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Abstract

The purpose of this research is to explore the potential for Internet panel-based survey research by conducting an experiment to investigate survey error that could hinder the validity of Internet-based survey results. In this experiment, a relatively new area of survey research - Internet surveys - is compared to a much-researched area of survey research - telephone surveys - through an experimental design that controls for sample origin. Although previous research done on telephone-Internet surveys has addressed data collection mode effects, none has been done which controls for sample origin. The present experiment is embedded in the design of the *Survey of Civic Attitudes and Behaviors After 9/11*, a study sponsored by RTI International and co-designed by RTII and the Odum Institute at the University of North Carolina, which is responsible for collecting 9/11 public policy-relevant attitudinal and behavioral data.

Three randomly selected sample groups completed the *Survey of Civic Attitudes and Behaviors After 9/11*: i) an Internet survey of active Knowledge Networks (KN) panel members, ii) a telephone survey of active KN panel members, and iii) a telephone survey of persons refusing to join the KN panel and those KN panel members who did not respond to the web survey. The first two random samples were drawn from active KN panelists, but differed in the mode of data collection (Internet versus telephone). The second and third samples overlapped in terms of mode of data collection (both are telephone), but the two groups differed in terms of sample origin (active KN panel members versus refusals). The design, therefore, provides a control group of KN panelists who participated using the telephone mode of data collection.

Various univariate and multivariate statistical tests were conducted in order to measure differences associated with mode of data collection and sample origins. The sources of error investigated are sample representativeness, mode effects, sample effects, panel experience effects, primacy and recency effects, the effects of visual versus aural survey administration, and non-differentiation in survey answers.

Differences among sample groups were found to be due primarily to mode of data collection and panel experience, and somewhat due to sample origin. Basic differences between Internet surveys and telephone interviews could be traced back to mode of data collection. The differences found between the mode of data collection in this telephone versus Internet study were strikingly similar to the telephone versus mail mode effects found in civic attitude studies

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by Tarnai and Dillman (1992) and in telephone versus face-to-face mode effects by Krysan (1994). Both studies found a tendency for telephone respondents to answer at the extreme positive end of the scale. In addition, this study found that Internet respondents were more likely than the telephone sample to use the full range of response option scales; therefore, non-differentiation was more prevalent in the telephone sample groups.

Introduction

According to the 2004 US Department of Commerce report, the United States is now “A Nation Online.” The growth rate of Internet use in the U.S. is estimated at about half a million new Internet users per month, and more than half of the nation (about 54%) is now online (NTIA, 2004). With these statistics in mind, the potential for Internet surveys cannot be ignored. Previous research by Couper (2000) and Krosnick and Chang (2001) found that Internet-based data collection can be a viable source of obtaining representative sample surveys. The purpose of this study is to explore the potential of Internet survey research by investigating two sets of factors which might influence survey answers: sample origin and mode of data collection. In addition, survey response data might also vary as a result of survey respondents’ experience on a research panel. This research attempts to control for these possible influences on survey responses, including the extent of respondents’ experience on a research panel.

Collecting data by Internet or by telephone might produce differing responses due to the inherent differences between the two modes of data collection. A 1996 article by Dillman, Sangster, Tarnai, and Rockwood discussed three major differences between mail and telephone surveys: 1) presence or absence of an interviewer, 2) dependence on visual or aural communication, and 3) interviewer or respondent control of pace and information sequence. Similar to mail surveys, Internet surveys do not require interviewers, depend on visual communication, and allow the respondent to control the pace of the interview. For these reasons, Internet surveys have produced similar results as mail surveys (Dillman et al. draft). In contrast, telephone interviews require an interviewer, depend on aural communication, and in most cases, give the interviewer control over the pace and sequence of the interview.

In this study, hypotheses can be made directly from the differences in mode of data collection (telephone or Internet). The presence of an interviewer creates a social interaction that may lead to social desirability effects, acquiescence, or question order effects. An interviewer might also generate pressure for respondents to answer quickly. Time pressure can result in top-of-the-head answers or answers on the extreme ends of the response scales. Dependence on either visual or aural communication might influence responses by changing the context for responding, and by affecting the memory process of the individual. The resulting mode effects include primacy and recency effects, question order effects, and extremeness on response scales. Finally, interviewer or respondent control of the pace and information sequence tend to affect the availability of information for the respondent (Dillman, Sangster, Tarnai, and Rockwood, 1996).

Numerous studies have shown mode effects between telephone and mail surveys (Tarnai and Dillman 1992, Krosnick and Alwin 1987, and Dillman 2000). The civic attitude studies by Tarnai and Dillman (1992) and the telephone versus face-to-face study by Krysan (1994) both found significant differences between telephone responses and mail responses. Some of the mode effects found between Internet and telephone survey administration fall under Krosnick’s (1991) definition of satisficing, which is when respondents either lack or choose not to utilize the cognitive effort needed to give an optimal response to survey questions. Non-differentiation, a

form of satisficing, occurs when respondents fail to distinguish between different questions and select the same answer choice on a scale for all, or almost all, similar questions (Krosnick and Alwin, 1987). Non-differentiation does not pertain to one mode of data collection in particular, and was investigated here as being affected by mode differences between Internet and telephone surveys.

Differences that at first might seem attributable to the mode of data collection, however, might in fact be the result of underlying differences in the representativeness of the survey samples. Data collected by telephone and by Internet might have obvious sample composition differences, such as under-representation of persons comfortable with or having access to computers in the Internet sample. Ideally, a study of data collection mode effects controls for possible sample composition effects. Differences in survey responses that might also be attributable to panel conditioning or panel experience were tested by comparing data collected by respondents currently on the KN panel and those that did not join the panel. Respondents who have taken many surveys could potentially have had a change in their attitudes and knowledge levels as a result of their participation in the panel and, consequently, may respond differently from those who have taken few or no panel surveys.

Data and Methods

The survey data used in our analyses is from the *Survey on Civic Attitudes and Behaviors After 9/11*, a study designed by researchers at RTI International and the Odum Institute at the University of North Carolina. Knowledge Networks (KN) collected the survey data between January and March 2002 using its probability sample of web-enabled households. The survey itself provides a rich context for the study of mode and sample origins effects, due to its wide range of 9/11 policy-relevant attitudinal and behavioral questions as well as batteries of self-perception questions about sociability and questions about attitudes towards neighbors.

As shown in Figure 1, three randomly selected sample groups are included in the study, and two modes of data collection, Internet and telephone, are utilized. The sample frame is list-assisted RDD sampling used by Knowledge Networks in recruitment for its web-enabled panel (Pineau & Dennis, 2004). Respondents who joined the KN panel are ‘Panel Acceptors,’ and were subsampled for this study in two groups: Internet sample and telephone sample. Persons that did not join the KN panel were subsampled randomly for inclusion in the Non-Response Followup Sample (NRFUS). This group includes a small random sample of current KN panel members who did not complete the Internet survey when invited. The entire NRFUS sample participated in the research using the telephone mode.

The principal advantage of the design of this study is that sample origin effects on survey response can be separated from mode of data collection effects because of the allowance for a control group of telephone interviews with active KN panelists. All three sample groups were administered the same questionnaire, with two exceptions. First, changes were made to the Internet version of the instrument in order to make it appropriate for interviewer-based (telephone) administration. Second, for questions on the Internet version that had an explicit ‘Don’t Know’ response option, the telephone survey instrument did not provide for the interviewer to read this option aloud but did allow the interviewer to code ‘Don’t Know’ when volunteered by the respondent.

The Internet portion of the study was fielded to a random sample of 3,627 active KN panelists. The field period was from mid-January through the end of February 2002. Of those sampled, 2,979 panel members completed this version of the survey for a completion rate of 82.1% (see Table 1). The Panel Telephone sample – the control group in the analysis -- consisted of a random sample of 477 active KN panelists; of these 300 (62.9%) completed the phone survey. The Panel Telephone and NRFUS groups were administered the survey between the end of January and early March 2002. The composition of the NRFUS sample is shown in Table 2 by stage of nonresponse to the panel recruitment invitation or to the Internet survey itself. In total, 2,730 cases were fielded and 600 (15.3%) completed the interview. NRFUS respondents were selected randomly from each of four stages of nonresponse as described in Table 2 and are described in detail below:

Stage 1. NRFUS: Refuses to Participate in Panel. This is a random sample of RDD phone lines initially sampled for panel recruitment and having one of the following final dispositions when the last call attempt was on November 1, 2001 or later: Ring/No Answer; RDD Refusal; Privacy Device; Nonworking Number. In the telephone interview, a “most recent birthday” question was asked of the person that answered the phone, to randomly identify an adult in the household for survey participation. The sample for this group is sized in proportion to its share of panel nonresponse.

Stage 2. NRFUS: Has not Connected WebTV. This is a random sample of individuals residing in households that had completed the RDD recruitment interview in November 2001, but had not connected the WebTV to the Internet as of January 25, 2002. One adult was selected at random in these households using the same technique as for Stage 1 NRFUS respondents.

Stage 3. NRFUS: Has Not Completed Initial Profile Survey. This is a random sample of individuals, with a limit of one per household, residing in households who completed the RDD recruitment interview between October 1, 2001 and November 30, 2001, and had connected the WebTV, but had not completed the first profile survey.

Stage 4: NRFUS: Does Not Complete Survey in Study. This is a random sample of active Internet panel members who did not respond to the invitation to complete the Internet version of the survey.

Table 3 shows a breakdown of the interview dispositions and cooperation rates for the NRFUS cases that did not join the KN panel at time of recruitment (Stage 1). Almost 72% of the NRFUS sample is in Stage 1 as a result of their large contribution to cumulative total panel nonresponse. Of the Stage 1 cases used for the study, 46% did not answer the phone when called during the panel recruitment and 12% were from cases that were non-working numbers. These cases were used for the NRFUS sample, as their status could potentially have changed by the time the *Survey of Civic Attitudes Study* was conducted. Of the 816 cases that had refused at the time of panel recruitment, 349 were successfully contacted and deemed eligible for the study, and 173 completed the interview (49.6% cooperation rate).

Without the benefit of a NRFUS sample, the cumulative response rate (AAPOR no. 3) for the web-panel survey is 11.0%, which takes into account all possible stages of nonresponse in recruiting and maintaining the panel. When including the contribution of the NRFUS surveys, the cumulative response rate is 36.0% using a weighted response rate calculation that takes into account the product of the NRFUS survey response rate and the proportion of nonresponse that is represented by the NRFUS sample groups.

Demographic Representativeness

The demographic composition of the three sample groups was compared to the January 2002 U.S. Census Current Population Supplement (CPS). Average errors were calculated using the CPS as a basis for comparison, and both unweighted and weighted samples were examined. Total average errors were also computed for each sample group.

Evaluating Data Collection Mode vs. Sample Origin Effects

Effects from mode of data collection were isolated while controlling for sample origins and other covariates by using multivariate statistical techniques. In each model, the hypothesized predictors were mode of data collection, sample origin, and panel experience, controlling for age, race/ethnicity, education level, and gender on variance in survey responses. By creating dichotomous variables for mode of data collection and NRFUS, each of the three sample groups is uniquely specified as follows:

	<u>MODE</u>	<u>NRFUS</u>
Internet	1	0
Panel Telephone	0	0
NRFUS	0	1

Panel experience is operationalized by the number of prior surveys completed by the respondent as a member of the KN panel. The covariates for selected demographic characteristics were added in an effort to help control for other factors might confound the estimation of the effects of mode and sample origins on survey responses. The analyses were conducted unweighted.

Ordered logistic regression models using the SPSS PLUM or the SAS PROC LOGISTIC procedures were applied when the dependent variables were ordinal in nature (e.g., categorical response data). For dependent variables with dichotomous response options, binary logistic regression was employed. For the few questions having quantitative data, such as the ‘feeling thermometer’ questions, general linear regression was used.

Testing for Presence or Absence of an Interviewer

Two batteries of questions were used to examine mode effects due to the presence or absence of an interviewer. The two sets of questions made it possible to assess the tendency to answer on the extreme end of the response scale, non-differentiation (i.e., repeated selection of same response option), primacy effects, and recency effects. Primacy effects occur when respondents repeatedly select the first answer choices in a list, and this type of effect is typically seen more often in self-administered surveys where respondents are reading and answering the questions themselves. Recency effects occur when respondents consistently select the last item in a scale and are more common in telephone interviews, where the response options are read.

Each battery of questions included 5 statements and used the same 11-point scale. The scale ranged from -5, ‘Completely disagree’, to +5, ‘Completely agree’, where 0 represented ‘Neither’. The first battery of statements dealt with the respondent’s feelings about his/her neighborhood, and the second battery was composed of self-perception statements. In order to assess the prevalence of positive and negative responses, the number of responses on the positive side of the scale were summed for each question and averaged overall. The same process was

completed for the negative side of the scale, the midpoint of the scale, and for those answering 'Don't know' or 'Refused.' For every respondent, the number of times he or she gave each answer across each battery of questions was counted. These counts were then used as a proportion of the number of times out of 5 the response was chosen for all options from -5 to +5. Next, the proportions were converted to percentages by sample group of the number of respondents who chose a given answer a specific proportion of times. The following are the statements included in this analysis:

Battery 1 Neighborhood Statements:

1. I am happy to live in this neighborhood.
2. I really see myself as a part of this neighborhood
3. I feel a sense of belonging to this neighborhood.
4. Being in this neighborhood gives me a lot of pleasure.
5. If there are things in my neighborhood that need to be fixed or improved, I would be able to get my neighbors to do something about it.

Battery 2 Self-Perception Statements:

1. I am trusting of others.
2. I easily fit into groups.
3. I like to mix with others.
4. I tend to be a happy person.
5. I enjoy helping others.

Testing for the Effects of Visual and Aural Communication

In order to assess the effects of dependence on visual or aural communication, the results of two 'feeling thermometers' are examined. The feeling thermometers were used to measure the respondent's attitudes toward George W. Bush and Al Gore on a scale of 0 to 100. For the Internet version, the respondent was able to see a thermometer on the screen and, by using an 'up' and 'down' arrow key, could register the degree of approval or disapproval on the scale. In contrast, the telephone respondents were given a description of the thermometer scale verbally.

Panel Experience

Because survey experience might lead to conditioning of respondents on the panel, a variable was created to represent panel experience by taking into account the exact number of surveys that each respondent had completed as part of the KN panel prior to this study. Respondents who had no prior experience taking a KN survey were considered to have "0" completed surveys for Panel Experience.

Results

Demographic Composition

Demographic comparisons between each of the three sample groups and the U.S. Census 2002 Current Population Survey (CPS) are presented in Tables 4 (unweighted) and 5 (weighted). For the unweighted data, the total average error is 2.8 percentage points for the Internet group, 4.1 percentage points for the Telephone Panel, and 3.6 percentage points for the NRFUS sample.

The largest average error in the three groups is found in the level of education completed. All of the samples are under-represented in the lower education groups. NRFUS has the highest average error among education levels (9.1 percentage points), followed by the Panel Telephone Sample (6.1 percentage points), and then the Internet sample (5.1 percentage points). Race and ethnicity have the lowest average errors for the unweighted data. The NRFUS sample improves the representativeness of the total sample for the youngest adult age group even though overall, the NRFUS sample is less representative than the Internet panel sample. After the application of post-stratification weights (shown in Table 5), the sample error rates decrease error by about half for the Internet and Telephone Panel samples but do not improve the representativeness of the NRFUS sample.

Data Collection Mode vs. Sample Origin

Multivariate analyses were conducted to estimate the predictors for responses to 44 survey questions. For 34 (77%) of the questions, mode of data collection is a significant predictor of response ($p < .05$). For 6 (14%) of the questions, sample origin (NRFUS) is a significant predictor of response. The summary of multivariate analyses grouped by question subject matter is shown in Table 6. Telephone-collected data, as compared to Internet-collected data when controlling for sample origins, shows a higher tendency for respondents to report that they:

- Disagree that bioterrorism is the most important problem
- Seek information on anthrax from ... the web, hotlines, national TV, own doctor, local government, or other sources
- Rate President Bush and Al Gore higher on feeling thermometers
- Discuss politics
- Discuss community issues
- Help neighbors
- Are happy about their neighborhood
- Have pride in their neighborhood
- Have a sense of belonging to their neighborhood
- Live in a neighborhood that brings them pleasure
- Rely on neighbors
- Trust others
- Like to mix socially with others

Detailed regression coefficient statistics for the multivariate analyses are posted at www.knowledgenetworks.com/ganp/papers/rtimodestudy.html.

Significance of mode of data collection

Multivariate analyses made evident that the mode of survey data collection has a significant effect on survey response data. Some of the findings from these analyses are below:

- Seeking information: Respondents were asked seven questions designed to measure their motivation to seek information about anthrax after the 9/11 terrorist attacks. Survey mode is shown to affect information seeking positively in that the participants in the telephone sample tend to be 74.1% more likely to seek this information from local or state health departments ($-1.35, p < .05$), and 75.7% more likely to seek information about anthrax from toll-free government phone numbers ($-1.415, p < .05$). Telephone sample members also have a 58.6% greater likelihood of seeking information from cable

24-hour news channels and network news channels (-0.88, $p < .05$). Mode also has a positive effect on seeking information from websites, with telephone sample respondents 63.6% more likely than Internet respondents to seek information through this means (-1.01, $p < .05$).

- Neighborhood statements: Mode of data collection is shown to have significant effects on responses for the neighborhood statements as well. First, participants were asked to provide a number for how many days a week they have dinner and/or participate in social events with neighbors, creating an eight-point response scale from '0 (Never)' to '7 (Every day)'. Members of the telephone sample show a 29% increase over Internet respondents in frequency of dinner and/or social events with neighbors (-0.32, $p < .05$). Respondents in the telephone samples also show a 10% increase in their frequency to informally chat with their neighbors (-.38, $p < .05$). Using an 11-point scale from -5 to +5, in which -5 represented 'Completely disagree,' +5 represented 'Completely agree' and 0 represented 'Neither,' telephone respondents are twice as likely as Internet respondents to see themselves as part of a neighborhood (0.70, $p < .0001$), and to rate higher their sense of belonging to a neighborhood (0.67, $p < .0001$).
- Self-perception statements: The same 11-point scale, ranging from -5 to +5, in which -5 represented 'Completely disagree', +5 represented 'Completely agree' and 0 represented 'Neither' was used for the self-perception statements. Mode is a significant predictor of responses for these measures as well, in that the telephone sample, as compared to the Internet sample, is more likely to give higher ratings for self-perception statements. The telephone sample shows increases of 3.2 in odds for being more likely to trust others (1.15, $p < .0001$), 2.2 in odds for feeling more that they easily fit into groups (0.78, $p < .0001$), 2.68 in odds to be more apt to like mixing socially with others (0.99, $p < .0001$), an increase of 2.2 in odds to give a higher rating in their tendency to be happy (0.80, $p < .0001$), and twice as likely to enjoy helping others (0.69, $p < .0001$).

Significance of NRFUS

Using the same multivariate models, we found only six questions for which responses appeared to have been affected by sample origins (NRFUS) when mode and other covariates are introduced:

- Grade Bush on terrorism: NRFUS respondents have a lower appraisal of Bush on an A-F grading scale, on average, by almost one-third of a grade (0.31, $p < .05$).
- Seeking information: (i) NRFUS respondents are 52.5% less likely to seek information about anthrax via websites (-0.74, $p < .05$); (ii) NRFUS respondents are 32.6% less likely to seek information about anthrax from local television and radio stations (-0.40, $p < .05$).
- Neighborhood and self-perception statements: NRFUS respondents show a decrease in feeling happy to live in their neighborhood (-0.212, $p < .0001$), and easily fitting into groups (-0.275, $p < .0001$) and an increase in enjoying helping others (0.191, $p < .0001$).

Significance of panel experience

The multivariate analyses yielded the following results:

- Seeking information: For every additional 10 surveys completed by a panel member, seeking information about anthrax from local TV and radio stations decreases by an average of 6% (-0.06, $p < .05$), while seeking such information from local or state health

departments decreases by an average of 8% ($-0.08, p < .05$), and from toll-free government information phone numbers, decreases by an average of 9% ($-0.09, p < .05$). A surprising finding was that for every incremental increase of 10 surveys completed, there is an average decrease of 5% in seeking information about anthrax from Internet health and news sites ($-0.06, p < .05$). We had speculated that information seeking on the Internet might be higher for those who have been exposed to more web surveys.

- Neighborhood statements: Panel experience also has significant negative effects on the group of neighborhood statements. Participants were asked to provide a number for how many days a week they have dinner and/or social events with neighbors, which created an eight-point response scale from '0 (Never)' to '7 (Every day)'. For every 10 additional surveys completed, participants show a 0.1% decrease in the frequency of having dinner and/or social events with neighbors as measured on the 0 to 7 scale ($-0.03, p < .05$). Using an 11-point scale from -5 to $+5$, in which -5 represented 'Completely disagree', $+5$ represented 'Completely agree' and 0 represented 'Neither', participants also show an increase in scores for seeing themselves as part of a neighborhood and feeling a sense of belonging to their neighborhoods ($0.03, p < .05$).
- Self-perception statements: The more panel experience a member had, the lower they rated their perceptions of self on an 11-point scale from -5 to $+5$, where -5 represented 'Completely disagree', $+5$ represented 'Completely agree' and 0 represented 'Neither'. Panel experience seems to have a positive relationship with the self-perception statements (based on increments of 10 additional surveys completed), with increases for both the perceptions of the participants' ability to fit easily into groups ($0.03, p < .0001$) and to like mixing socially with others ($.04, p < .0001$). Completion of 10 additional surveys also showed an increase in tendency to be happy ($0.03, p < .0001$), and in the enjoyment of helping others ($0.06, p < .0001$).

Effect of Presence or Absence of an Interviewer

Extremeness on Response Scales

Tables 7 and 8 display the results of the two batteries of questions used to assess the tendency of respondents to answer on the positive end of the scale. For the battery of neighborhood statements (Table 7), there are significant differences ($p < .05$) in the means for positive, negative, and neutral response categories of statements between both the Internet sample and the Panel Telephone sample as well as the Internet sample and the NRFUS sample. The groups interviewed over the telephone tended to give responses on the positive end of the scale, with the Panel Telephone sample at 79.6% and the NRFUS sample at 76.9%. These figures are much higher than the Internet sample group, of which 66.2% gave positive responses. In addition, the Internet sample has a higher percentage of respondents choosing 'Neither' (16.5% compared to 10.3% for the Panel Telephone sample).

Table 8 shows an even stronger manifestation of mode effects. Participants were asked to rate self-perception statements on an 11-point scale. For these questions, the respondent was required to give opinions of him or herself. Ninety percent of respondents in each of the telephone sample groups answer positively on the scale in this battery of questions, while only 77.6% of the Internet sample group to do so. Internet respondents are roughly two times as likely as the respondents from either of the telephone samples to select an answer in the negative response range (-5 to -1) and more than twice as likely as the telephone respondents to select 'Neither (0).' The differences between the Internet sample and the telephone samples are significant for positive, negative, and neutral response categories.

The telephone samples are more likely than the Internet sample to ‘Completely agree’ with all the statements in the two batteries, as shown in Tables 9 and 10. For every statement about neighborhoods, a higher percentage of telephone respondents chose ‘Completely agree’ than Internet respondents. Differences among the responses to these questions range from a high of 22.1 percentage points between NRFUS and Internet samples on the first statement: ‘Happy to live in neighborhood’, to a low of 13.3 percentage points between Panel Telephone and Internet sample groups on the statement: ‘If something needs fixed, neighbors will do something.’ All significant differences between the Telephone and Internet responses (T-I), as well as the NRFUS and Internet responses (N-I), are at the .05 alpha level. The average difference for the five neighborhood questions is highest between the NRFUS sample and the Internet sample at 17.8 percentage points, and the average difference between the Panel Telephone sample and the Internet sample is 14.6 percentage points.

This pattern is also found in responses to the statements about self-perceptions of sociability. As shown in Table 10, telephone respondents from the KN panel report more often that they ‘Completely agree’ with the self-perception statements (an overall average 16.8 percentage points more often than Internet respondents). NRFUS respondents, also participating by the phone mode, are more likely to ‘Completely agree’ as well (20.3% higher average than Internet). The differences between the Panel Telephone and Internet samples, as well as the NRFUS and Internet samples, are significant at $p < .05$ level.

Effects of Dependence on Visual or Aural Communication

Feeling Thermometers

Two questions provided feeling thermometer response options, and asked respondents to rate George W. Bush and Al Gore on a scale from 0 to 100. Table 11 provides an overview of the feeling thermometer responses. The differences in means are significant at the .01 alpha level. Mean ratings for Bush are 67 for the Internet sample and 74 for the telephone samples (an average 7% increase for telephone respondents). There is also a 7% average increase in the ratings for Al Gore by the telephone respondents, as compared to the Internet sample, where the Internet sample shows a mean rating of 42.7 and the Non-NRFUS Telephone sample has a mean score of 50.9. The NRFUS panel has a mean rating of 45.1. In summary, the Panel Telephone sample shows an average 5.8% increase in ratings over the NRFUS sample. These findings show that the ratings for the feeling thermometers conform to the noted pattern that there are differences between Internet respondents and telephone respondents, and that telephone respondents will choose higher ratings for questions such as these. A surprising finding was the significant difference found between NRFUS and the Panel Telephone sample for the Gore ratings. As expected, there is no significant difference between NRFUS and the Panel Telephone sample in ratings for Bush, yet there is a 5.8% increase in scores for Gore by the Panel Telephone sample, showing that Panel members who took the survey by telephone rate Gore more favorably than non-responders and non-panel members.

Analyses of mode administration effects for each sample group also demonstrate differences. First, for the thermometer ratings for Bush, the mode for the Internet group is 100, with 15% of respondents choosing this response. The mode for telephone sample groups is not as high as the Internet group, with 15% of the Panel Telephone group responding with 80 and 15% of the NRFUS responding with 90. The rating for Gore shows similar trends. The Internet mode for

Gore ratings is 0, with 14.4% of the sample giving this answer. In both telephone groups, 25% of the samples rate Gore at 50, making it the most common answer choice. The Internet sample is more likely to use the full scale and the telephone group is more likely to choose numbers that are multiples of 5.

Percentage response questions

Three questions in the survey asked respondents to provide a percentage (anywhere from 0% to 100%) in response to statements about the respondents' neighbors. The first of these, which asked, "What percentage of the people who live in your neighborhood would you say can be trusted?" shows the greatest mean differences of the three questions. A significant 10.6% difference was found between the Panel Telephone and Internet respondents, with telephone respondents more likely to select a higher percentage rating ($p < .01$). Respondents in the NRFUS sample also tended to select higher percentages, with an 8.7% average increase over Internet respondents ($p < .01$). In the Internet sample, 12.3% of respondents reply that 50% of the people in their neighborhood could be trusted. Both telephone samples have a mode of 100 with the 14.5% of the panel telephone and 15.4% of the NRFUS Sample choosing 100 as their response. In addition, almost the same percentage, 14.2%, of the panel telephone sample responded that 80% of their neighbors could be trusted.

The second question asked "What percentage of the people who live in your neighborhood do you think would try to return a wallet they found with \$100 and an ID in it to its owner?" Approximately five percentage points separate the mean responses of the three sample groups for this question, and all modes are at 50%. Question 3 in this section asked, "What percentage of your neighbors' names do you know?" The mean response for this question is close to one-third (33%) for all sample groups. The means and mean differences for these questions are displayed in Table 12.

Item Non-differentiation

Item non-differentiation occurs when respondents choose the same response for all or nearly all of the questions in a series (Krosnick and Alwin, 1988). Tables 12 and 13 show evidence for non-differentiation observed in the data. In order to assess non-differentiation, a number was computed for each response on the 11-point scale, which represented the amount of times, out of five, the respondent selected an answer, since there were five statements in each battery. Frequencies were run on these numbers to show the percentage of the sample who chose that point on the scale, anywhere from 0 to 5 times.

The tendency for Panel Telephone respondents to select on the positive end of the scale is evident here, in Tables 13 and 14. Tables 15 and 16 show an abbreviated version of the extremes found in Tables 13 and 14. Non-differentiation is present in both of the telephone samples.

Results from the battery of neighborhood statements show that 16.0% of the KN Panel Telephone sample and 13.8% of the NRFUS sample (both telephone mode samples) chose 'Completely agree' five out of five times. In the same groups, 14.8% of the Panel Telephone and 17.3% of NRFUS chose 'Completely agree' four out of five times. This effect is not as prevalent in the Internet sample, as only 5% of respondents chose 'Completely agree' five out of five times and 10.1% of respondents chose the same answer four out of five times. The differences between the proportions for the response 'Completely agree' between the Internet sample and each of the phone samples are significant at the .05 alpha level. On the negative end of the scale, over 91%

of respondents in the telephone sample chose no negative responses to any neighborhood statements, while almost 60% chose 'Completely agree' at least one time in the five statements. With the exception of 10% selecting 'Completely agree' four out of five times, the Internet sample shows less than 6% of the sample chooses the same answer more than three times for all responses.

Similar results were found in analyses of the self-perception statements. As shown in Table 14, Panel Telephone respondents tend to choose positive responses more often. Only 2.2% of the Internet sample chose 'Completely agree' five out of five times, and 4.1% chose it four out of five times. In contrast, almost 10% of the Panel Telephone sample and 11.3% of the NRFUS sample chose 'Completely agree' for every statement. A greater percentage, 11%, of the Panel Telephone and 15 % of the NRFUS, chose 'Completely agree' four out of five times. Significant differences at the .05 alpha level are present between the Internet sample and the two telephone samples for the 'Completely agree' response for 4/5 and 5/5 proportions of the same answers.

In Table 13, the first row for each sample group represents the respondents who did not choose the response (e.g. 'Completely agree') for any of the five statements. For all answer choices (except 'Agree' (4) and 'Completely agree' (5)) in the two sets of questions, both telephone samples had a greater percentage of respondents who did not choose the respective answer choice. This shows that the respondents in the Internet sample are more likely to use the entire scale, while the respondents in the telephone sample are more likely to choose either 'Agree' (4) or 'Completely agree' (5). For the neighborhood questions, approximately 45% of respondents in the Internet sample chose 'neutral' (0) at least one out of five times, with just under 25% of telephone respondents selecting that answer only one time.

Primacy and Recency Effects

Some respondents appear to have chosen the first or last alternative solely because of their position in the response ordering (Krosnick and Alwin, 1987). In the questionnaire, 'Completely disagree' was the first answer choice on the scale and 'Completely agree' was the last answer choice listed or read. In this study, respondents in the telephone sample may have chosen answers on the positive end of the scale due to recency effect, as the positive response choices were the last ones heard by a respondent. Few respondents from any of the samples answered on the negative end the scale, which were the first options in the series. Therefore, no primacy effects were evident in the data.

Discussion

Initial research by E. Wiebe et al. (2002) showed that only mode effects, not sample origins, were creating differences in results. Here, when comparing the two samples and the two modes of data collection, the greatest number of significant differences at the .05 alpha level is again seen in mode of data collection. The results revealed in this study provide evidence for mode effect and panel experience significance while showing sparse support for differences due to sample origin.

In the next few years, Internet surveys may dramatically change the field of survey research, and in many ways already have. The true potential of the Internet as a mode of data collection cannot be realized until measurement errors are recognized. The purpose of this research is to explore mode effects between Internet and telephone surveys in order to investigate

measurement error in Internet surveys. A sample group was created to control for sample origin, a possible cause of error in Internet surveys. Because research on mode effects involving Internet and telephone data is still new, finding information on the topic is relatively difficult. Therefore, the results found here are compared to results found in mail versus telephone studies. The comparison of Internet versus telephone and mail versus telephone studies is feasible because mail and Internet surveys are both self-administered. Current research by Dillman et al. shows that the two modes tend to produce similar results (2003). By using telephone versus mail studies as examples, mode effects between Internet and telephone surveys become even more apparent. Three mode effect studies in particular showed results similar to those found in this study, and varying interpretations were provided with each study. In addition, two of the three research topics were on general civic issues similar to the questions included in the 'Survey on Civic Attitudes and Behaviors After 9/11' analyzed in this research. The results from the three studies are summarized in the paragraphs below.

In an unpublished study of the general public in 1984, Dillman and Mason found that, in survey research, face-to-face respondents and telephone respondents were significantly more likely than mail respondents to choose, the most positive end of the answer scale for neighborhood and community issues. 'Not a problem' was the most positive answer choice, with the other response options as 'a small problem', 'a medium problem,' 'a serious problem,' or 'don't know.' In 1991, Tarnai and Dillman replicated this study using a student population, and even greater mode differences were observed. This was attributed to three differences observed between telephone and mail surveys: social effects of interviewer presence, short-term memory effects, and pace and control over the interview.

A second study by Krysan et al. in 1994 was based on face-to-face interviews from a 1992 Detroit area study and a shorter mail questionnaire sent around the same time. Neighborhood satisfaction questions were asked in this study as well, and four answer choices were in response scale: 'always,' 'often,' 'sometimes,' and 'never.' The questions asked if certain issues in the city were a problem, so the most positive response would be 'never.' Krysan found that respondents tended to choose the last answer choice ('never'), more often in the face-to-face interviews than the mail interviews. In addition, mail respondents were more likely than face-to-face respondents to choose the first answer choice, which was 'always.' With these results in mind, the findings were attributed to primacy and recency effects.

Finally, in an unpublished draft, Dillman et al. describes a study of mixed mode surveys. The study looks at four modes: mail, telephone, interactive voice response (IVR), and the Internet. The study showed that telephone respondents were more likely than mail respondents to select an extreme response, while mail respondents were more likely to select a middle response category (Dillman et al., Draft). The authors dismissed a recency effect hypothesis that telephone survey respondents are more likely to select the last response category. They attributed mode differences to the aural versus visual nature of the surveys. For this reason, one of the main findings shows that differences could be seen between two groups, one containing modes of a visual medium, mail and Internet, and the second containing modes of an aural nature, telephone and IVR.

In the present study, multivariate analyses show that patterns can be seen when controlling for demographic characteristics and panelist survey experience. Results of these analyses show that the mode of data collection has significant effects on quite a few responses. Motivation to seek information, attitudes about neighbors and one's neighborhood, and self-perception statements all show a significant increase in scoring when statistical tests are run with mode as a predictor.

One possible explanation of this difference may be attributed to the pattern that telephone respondents have a stronger tendency to select the positive end of the scales. When compared with the Internet mode group, the telephone samples continuously had more positive responses.

Some patterns found in the data are also worthy of note. Contrary to our hypothesis, the more experienced panel members are, the less likely they are to seek information on the Internet about anthrax. Our hypothesis was based on a common assumption that people who participate in surveys more often are better informed and more motivated to find information. One would also plausibly assume that Internet-based panel member experience increases the likelihood of seeking information on the Internet, due to the fact that this type of participant is more familiar with web-based activities; however, the data shows that Internet mode and panel experience both have a significant negative effect on information-seeking habits.

There is also a significant negative relationship between panel experience and the neighborhood and self-perception statements. This might happen because, as participants take more surveys, they become more knowledgeable about and more comfortable with the process, and conceivably might answer questions more honestly. Panel experience is shown to be a predictor of participants' responses for about seven in ten measures examined in this paper.

Out of 44 survey questions, only six were found to be significantly affected by whether the person is a panel recruitment non-responder or a non-responder to invitations to complete the panel survey research. This finding challenges the perspective that there are large differences in attitudes and beliefs between people who are willing to participate in survey research and those who are not.

The topic of the questions in the 'Survey on Civic Attitudes and Behaviors After 9/11' might have had an impact on the trajectory of the findings. Although distributions of responses from all sample groups are skewed toward the positive end of the scale, this tendency is more prevalent in the telephone groups. Respondents from these groups are more likely to answer 'Completely agree' to both sets of questions. Two questions asked about neighborhood issues on percentage scales from 0-100%, and the telephone sample groups have means that were significantly higher than the means for the Internet group. The question that asked for a percentage of neighbors' that can be trusted might be considered sensitive, which would possibly explain why so many telephone respondents selected 100%.

Close to 30% of the Panel Telephone and NRFUS samples use the 'Completely agree' response option at least four out of five times in the neighborhood question battery, and over 20% of both telephone samples use the extreme positive response at least four out of five times for the self-perception questions. By definition, non-differentiation occurs when respondents fail to distinguish between different questions and select the same answer choice on a scale for all or almost all questions. In general, Internet respondents use a greater portion of the scale more often than telephone respondents. For these reasons, non-differentiation appears to be present in the telephone samples for the neighborhood and self-perception statements. A combination of social desirability, cognitive ability, lack of motivation, and mode of data collection may be the cause of such non-differentiation.

Questions on neighborhood issues and other civic attitudes may also be susceptible to the social effects of interviewer presence (Dillman, 2001). An interview is a social interaction, and respondents interviewed by telephone may wish to appear more favorably to the interviewer. A positive response to the neighborhood and self-perception questions would make the respondent

appear favorably to the interviewer; therefore, the effects of social desirability might be overshadowing primacy or recency effects present in this research.

Some differences between Internet and telephone modes may stem from the fact that Internet surveys are visual and telephone surveys are aural in nature. Internet respondents can see response scales, response choices and other images that telephone respondents cannot see. The feeling thermometer presented in the Internet version was an actual thermometer on the screen and respondents were able to see the increase in the temperature based on what they chose. A question like the feeling thermometer may not lead to the same results for telephone interviews where the respondents must listen to the response categories. The interviewer has control of the answer scales and may not represent each answer choice on the scale equally (Dillman et al, Draft). Significant differences are observed for both feeling thermometer questions, and this visual versus aural nature of the survey may possibly be the cause.

The findings from this research provide considerable evidence that the mode of data collection has an effect on response. The results show that the two telephone groups tend to be similar in response to almost all questions, while sample origin (KN panel versus panel rejectors) plays a less important role in accounting for responses.

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Figure 1. Sample Design Model

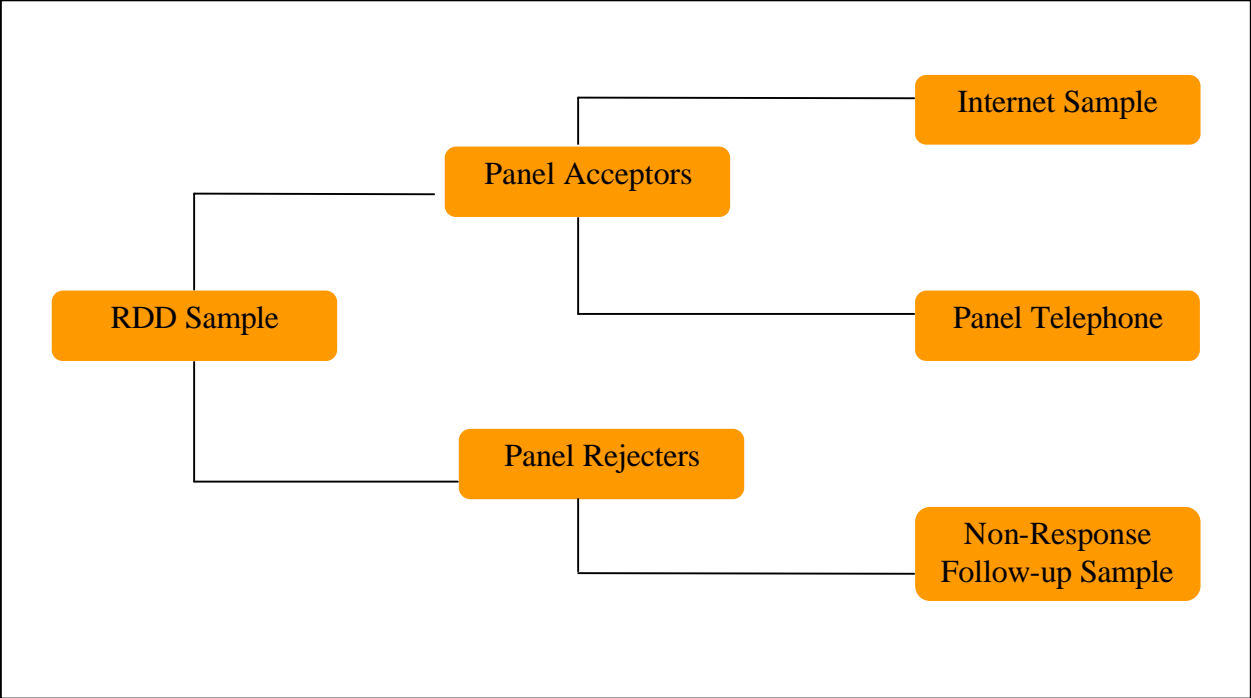


Table 1. Number of Completed Interviews by Sample Group

Sample Group	Sample Size	Interviews Completed	Completion Rate
1 Internet	3627	2979	82.1%
2 Panel Telephone	477	300	62.9%
3 NRFUS	2730	600	22.0%
Total Interviewed		3879	

Table 2. Composition of the NRFUS Sample Group

Respondent Nonresponse Stage	Sample Size	Interviews Completed	Completion Rate
1 Refuses to participate in panel	1962	300	15.3%
2 Does not Connect Web TV	281	100	35.6%
3 Does not Complete Initial Profile Survey	254	100	39.4%
4 Does not complete Survey in Study	233	100	42.9%
Total Interviewed		600	

Table 3. NRFUS Interview Dispositions By RDD Recruitment Disposition

Sample	N Fielded	I - Interview Completed		R - Refusal		NC - Non-contact		O - Other		UH - Unknown HH		Ineligible		AAPOR COOP3 Rate
		N	%	N	%	N	%	N	%	N	%	N	%	
RDD Ring/No Answer	894	119	13.3%	86	10%	83	9%	18	2%	475	53%	113	13%	58.0%
RDD Refusal	816	173	21.2%	176	22%	123	15%	23	3%	257	31%	64	8%	49.6%
RDD Privacy Device	11	1	9.1%	0	0%	0	0%	0	0%	9	82%	1	9%	100.0%
RDD Nonworking no.	241	7	2.9%	6	2%	7	3%	2	1%	31	13%	188	78%	53.8%
Total	1962	300	15.3%	268	14%	213	11%	43	2%	772	39%	366	19%	52.8%

Table 4. Demographic Comparison of Unweighted Samples

		Internet	Telephone	NRFUS	CPS
Education	Less than HS	9.3%	11.0%	9.1%	16.7%
	HS	29.5%	25.7%	21.7%	32.3%
	Some college	34.1%	32.0%	33.1%	27.1%
	Bachelor or higher	27.1%	31.3%	36.1%	24.0%
	TOTAL	100.0%	100.0%	100.0%	100.0%
	N	2979	300	600	
	Average Error	5.1	6.1	9.1	
Income	<\$25,000	22.2%	20.8%	21.6%	26.1%
	\$25,000-\$49,999	35.5%	33.2%	33.5%	29.2%
	\$50,000-\$74,999	23.5%	25.2%	20.5%	20.1%
	\$75,000+	18.9%	20.8%	24.4%	24.7%
	TOTAL	100.0%	100.0%	100.0%	100.0%
	N	2958	298	468	
	Average Error	4.8	4.6	2.4	
Age	18-24	8.3%	8.3%	11.0%	13.3%
	25-34	17.6%	13.0%	16.0%	18.0%
	35-44	21.8%	25.7%	19.8%	21.6%
	45-54	21.5%	22.7%	19.6%	18.9%
	55-64	15.3%	19.0%	14.5%	12.2%
	65-74	10.6%	8.0%	12.2%	8.7%
	75+	4.9%	3.3%	6.9%	7.4%
	TOTAL	100.0%	100.0%	100.0%	100.0%
	N	2979	300	592	
	Average Error	2.2	4.2	1.9	
Ethnicity	White, Non-Hispanic	75.4%	78.0%	79.4%	72.7%
	Black, Non-Hispanic	11.5%	10.3%	10.4%	11.6%
	Other, Non-Hispanic	4.6%	4.0%	3.6%	4.7%
	Hispanic	8.5%	7.7%	6.6%	10.9%
	TOTAL	100.0%	100.0%	100.0%	100.0%
	N	2979	300	587	
	Average Error	1.4	2.7	3.3	
Gender	Male	47.7%	51.0%	49.5%	48.0%
	Female	52.3%	49.0%	50.5%	52.0%
	TOTAL	100.0%	100.0%	100.0%	100.0%
	N	2979	300	600	
	Average Error	0.3	3.0	1.5	
TOTAL AVERAGE ERROR		2.8	4.1	3.6	

Table 5. Demographic Comparison of Weighted Samples

		Internet	Telephone	NRFUS	CPS
Education	Less than HS	15.8%	16.5%	7.5%	16.7%
	HS	32.5%	32.3%	23.4%	32.3%
	Some college	27.8%	26.9%	32.7%	27.1%
	Bachelor or higher	23.9%	24.2%	36.4%	24.0%
	TOTAL	100.0%	100.0%	100.0%	100.0%
	N	2979	300	600	
	Average Error	0.5	0.2	9.0	
Income	<\$25,000	36.5%	24.8%	20.9%	26.1%
	\$25,000-\$49,999	31.7%	37.7%	34.1%	29.2%
	\$50,000-\$74,999	17.9%	21.0%	19.6%	20.1%
	\$75,000+	13.9%	16.4%	25.4%	24.7%
	TOTAL	100.0%	100.0%	100.0%	100.0%
	N	2958	298	468	
	Average Error	6.5	4.7	2.8	
Age	18-24	11.3%	14.0%	11.8%	13.3%
	25-34	18.8%	16.0%	16.2%	18.0%
	35-44	22.2%	22.7%	16.3%	21.6%
	45-54	18.7%	19.5%	20.2%	18.9%
	55-64	13.8%	17.2%	15.8%	12.2%
	65-74	10.5%	7.8%	12.9%	8.7%
	75+	4.7%	2.8%	6.9%	7.4%
	TOTAL	100.0%	100.0%	100.0%	100.0%
	N	2979	300	592	
	Average Error	1.4	2.1	2.6	
Ethnicity	White, Non-Hispanic	72.2%	73.9%	78.7%	72.7%
	Black, Non-Hispanic	11.8%	12.1%	10.6%	11.6%
	Other, Non-Hispanic	4.9%	3.6%	4.1%	4.7%
	Hispanic	11.1%	10.3%	6.6%	10.9%
	TOTAL	100.0%	100.0%	100.0%	100.0%
	N	2949	300	558	
	Average Error	0.3	0.9	2.6	
Gender	Male	47.7%	48.3%	51.5%	48.0%
	Female	52.3%	51.7%	48.5%	52.0%
	TOTAL	100.0%	100.0%	100.0%	100.0%
	N	2979	300	600	
	Average Error	0.2	0.3	3.6	
TOTAL AVERAGE ERROR		1.8	1.7	4.1	

Table 6. Summary of Multivariate Analyses: Count of Statistically Significant Predictors of Answers by Mode and NRFUS ($p < .05$).

	N items	N significant for mode	N significant for NRFUS
Grade Bush's performance (attitudinal)	2		1
Worried about terrorism (attitudinal)	2	2	
Information expected during bioterrorist event (attitudinal)	6	5	
Sources from which anthrax information sought (behavioral)	6	6	2
Trusted source during bioterrorism event (attitudinal)	1		
Feeling thermometers for Bush and Gore (attitudinal)	2	2	
Important issues, politics, current events (behavioral)	3	3	
Neighborhood statements (combination - attitudinal and behavioral)	13	9	1
Self-perception statements (attitudinal)	5	5	2
Volunteerism and/or donating behavior (behavioral)	4	2	
	44	34	6
	100 %	77.27 %	13.64 %

Table 7. Average Response by Sample Group; Neighborhood Statements.

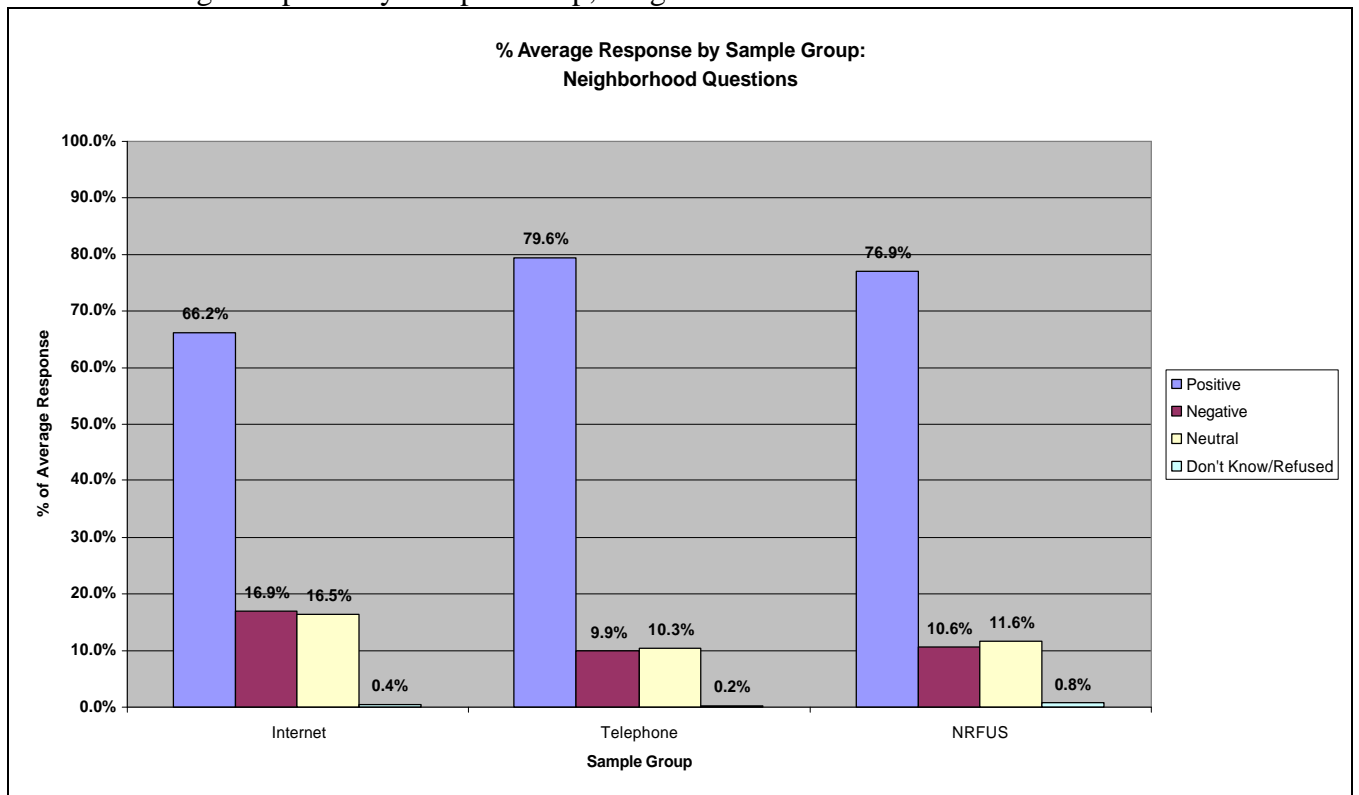


Table 8. Average Response by Sample Group; Self-perception Statements

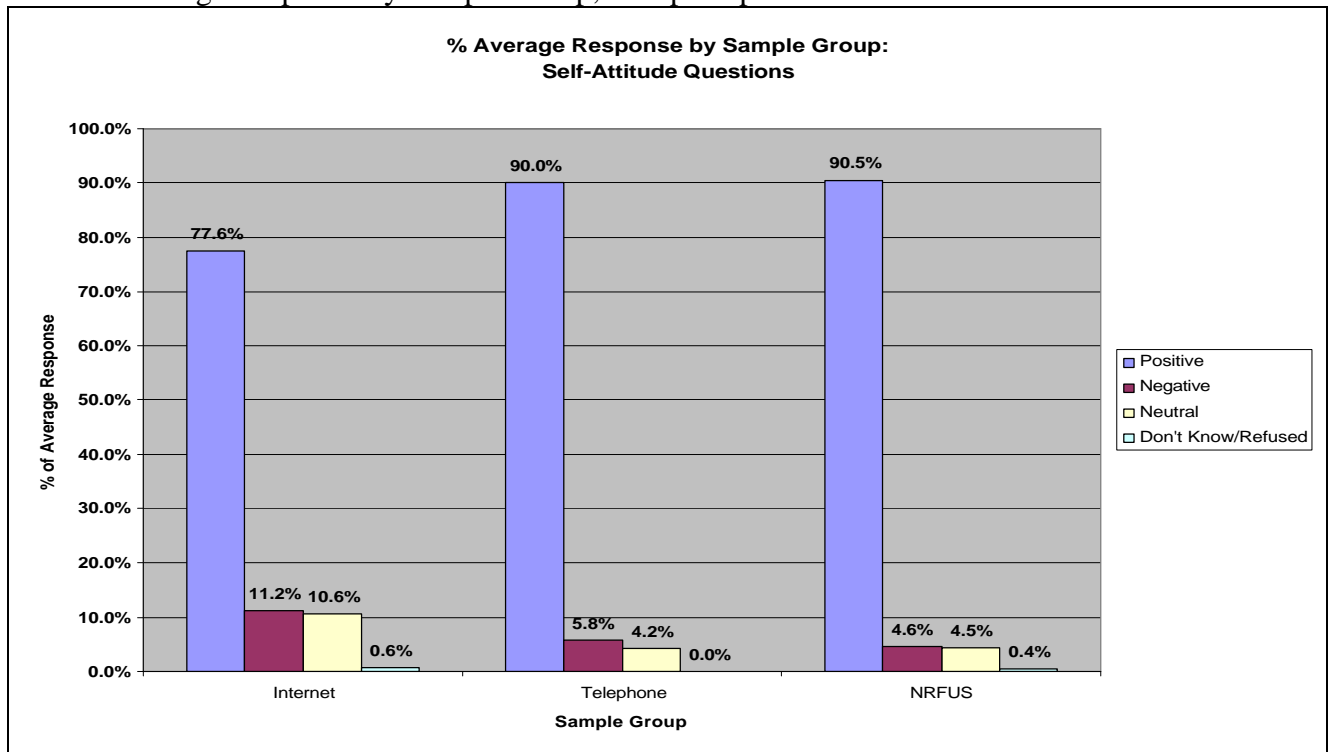


Table 9. Respondents Who Choose “Completely Agree” in Response to Neighborhood Statements

Completely Agree	Internet (I)	Telephone (T)	NRFUS (N)	Difference		
				T-I	N-I	N-T
Happy to live in Neighborhood	34.8%	47.0%	56.9%	12.2*	22.1*	9.9*
See myself as Part of Neighborhood	21.39%	39.15%	37.87%	17.8%	16.5%	-1.3%
Feel a sense of belonging to Neighborhood	22.49%	36.76%	41.10%	14.3%	18.6%	4.3%
Being in Neighborhood gives Pleasure	23.4%	38.0%	41.8%	14.5*	18.4*	3.8
If something needs fixed, neighbors will do something	9.1%	23.4%	22.3%	14.4*	13.3*	1.1
Average	22.2	36.9	40.0	14.6	17.8	3.6

*Significance: $p < .05$

Table 10. Respondents Who Choose “Completely Agree” in Response to Self-perception Statements

Completely Agree	Internet (I)	Telephone (T)	NRFUS (N)	Difference		
				T-I	N-I	N-T
I am trusting of others	9.4%	28.0%	28.3%	18.6*	18.8*	0.3
I easily fit into groups	12.2%	23.4%	30.8%	11.1*	18.6*	7.4
I like to mix with others	12.9%	33.7%	37.4%	20.8*	24.4*	3.7
I tend to be a happy person	22.9%	41.3%	46.8%	18.4*	23.9*	5.5
I enjoy helping others	36.3%	51.5%	52.0%	15.2*	15.7*	0.5
Average	18.8%	35.6%	39.0%	16.8	20.3	3.5

*Significance: $p < .05$

Table 11. Means and Mean Differences for Feeling Thermometer Questions

	Internet Telephone NRFUS			T-I	N-I	N-T
	(I)	(T)	(N)			
Bush	67.0	73.3	73.3	6.3*	6.3*	0.0
Gore	42.7	50.9	45.1	8.2*	2.4*	5.8*

*Significance: $p < .01$

Table 12. Means and Mean Differences for Three Neighborhood Questions

Neighborhood % Questions	Mean %			Absolute Difference in Means		
	Internet (I)	Telephone (T)	NRFUS (N)	T-I	N-I	N-T
% of Neighbors can be trusted	55.5%	66.1%	64.2%	10.6*	8.7*	1.9
% of Neighbors would return wallet	50.4%	55.5%	55.4%	5.1*	5.0*	0.1
% of neighbors' names you know	33.5%	36.5%	34.6%	3.0	1.1	1.9

*Significance: $p < .01$

Table 13. Percentage of Respondents by Sample Group That Choose Each Respective Answer Choice a Given Number of Times Out Of Five for the Neighborhood Questions

Neighborhood Statements

	Proportion out of 5	Completely Disagree					Neutral					Completely Agree	
		-5	-4	-3	-2	-1	0	1	2	3	4	5	
Internet	0	84.9%	94.2%	88.9%	90.2%	88.3%	54.9%	76.5%	69.1%	56.5%	63.1%	58.7%	
	1	7.9%	4.5%	8.2%	7.9%	8.7%	24.5%	16.6%	21.9%	24.4%	19.5%	12.5%	
	2	2.0%	0.7%	2.2%	1.3%	2.1%	10.4%	4.7%	6.2%	11.0%	8.6%	7.7%	
	3	1.5%	0.4%	0.6%	0.4%	0.7%	5.6%	1.5%	1.9%	4.5%	5.3%	6.2%	
	4	1.6%	0.2%	0.1%	0.0%	0.2%	2.5%	0.6%	0.8%	3.1%	2.5%	10.1%	
	5	2.0%	0.0%	0.0%	0.1%	0.0%	2.1%	0.1%	0.1%	0.6%	1.0%	4.9%	
Telephone	0	89.6%	95.7%	95.4%	93.3%	92.4%	66.8%	77.3%	68.3%	58.8%	67.4%	41.1%	
	1	5.1%	3.6%	4.6%	4.6%	6.1%	19.9%	16.8%	20.1%	20.4%	15.3%	15.2%	
	2	2.0%	0.6%	0.0%	2.0%	1.2%	9.4%	3.4%	8.1%	13.6%	8.2%	8.6%	
	3	1.7%	0.0%	0.0%	0.0%	0.2%	2.8%	2.5%	3.5%	4.5%	5.7%	4.3%	
	4	0.4%	0.0%	0.0%	0.0%	0.1%	1.0%	0.0%	0.1%	2.3%	2.7%	14.8%	
	5	1.1%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.4%	0.6%	16.0%	
NRFUS	0	86.8%	95.2%	95.0%	94.2%	94.4%	68.0%	83.9%	80.0%	57.2%	65.1%	35.1%	
	1	8.2%	3.7%	2.8%	4.4%	4.3%	18.8%	10.9%	14.2%	23.6%	20.4%	15.3%	
	2	2.0%	1.0%	1.4%	1.2%	1.3%	5.6%	2.7%	4.0%	10.9%	7.8%	9.2%	
	3	1.1%	0.2%	0.8%	0.2%	0.1%	3.9%	1.8%	1.4%	6.0%	4.5%	9.4%	
	4	0.9%	0.0%	0.0%	0.0%	0.0%	2.4%	0.7%	0.4%	1.7%	2.2%	17.3%	
	5	1.0%	0.0%	0.0%	0.0%	0.0%	1.4%	0.0%	0.0%	0.7%	0.0%	13.8%	

Table 14. Percentage of Respondents by Sample Group That Choose Each Respective Answer Choice a Given Number of Times Out Of Five for the Self-perception Questions

	Proportion out of 5	Completely Disagree					Neutral					Completely Agree	
		-5	-4	-3	-2	-1	0	1	2	3	4	5	
Internet	0	93.8%	96.3%	92.1%	88.5%	86.4%	66.6%	70.6%	57.0%	40.2%	45.4%	52.7%	
	1	3.6%	3.2%	6.1%	9.2%	10.9%	21.5%	20.1%	29.9%	33.3%	28.6%	22.4%	
	2	1.4%	0.4%	1.5%	1.8%	2.2%	7.1%	7.4%	10.0%	17.8%	15.5%	11.8%	
	3	0.6%	0.2%	0.3%	0.4%	0.5%	2.9%	1.3%	2.6%	6.0%	7.3%	6.9%	
	4	0.4%	0.0%	0.0%	0.1%	0.0%	1.1%	0.4%	0.4%	2.0%	2.5%	4.1%	
	5	0.1%	0.0%	0.0%	0.0%	0.0%	0.9%	0.1%	0.1%	0.6%	0.7%	2.2%	
Telephone	0	93.0%	97.6%	96.9%	94.2%	95.7%	82.9%	85.6%	70.0%	43.0%	43.8%	35.1%	
	1	5.1%	2.3%	2.5%	2.6%	4.3%	13.3%	7.9%	22.0%	28.2%	25.2%	16.7%	
	2	1.6%	0.1%	0.6%	3.2%	0.0%	3.5%	4.3%	7.3%	17.0%	14.7%	13.8%	
	3	0.3%	0.0%	0.0%	0.0%	0.0%	0.3%	1.7%	0.7%	9.3%	12.0%	13.5%	
	4	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	1.9%	3.4%	11.3%	
	5	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	1.0%	9.6%	
NRFUS	0	92.7%	98.9%	96.8%	96.0%	96.6%	84.6%	85.8%	72.7%	48.4%	44.3%	33.8%	
	1	5.7%	1.1%	2.9%	3.5%	3.2%	11.1%	11.3%	19.8%	25.5%	24.6%	14.0%	
	2	0.9%	0.0%	0.3%	0.4%	0.2%	2.8%	1.9%	4.6%	17.5%	16.0%	13.2%	
	3	0.1%	0.0%	0.0%	0.1%	0.0%	0.7%	0.4%	2.4%	6.0%	7.8%	12.5%	
	4	0.5%	0.0%	0.0%	0.0%	0.0%	0.6%	0.2%	0.2%	1.8%	6.1%	15.2%	
	5	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.4%	0.2%	0.9%	1.1%	11.3%	

Table 15. Non-Differentiation Demonstrated in Neighborhood Statements

Response: Completely Agree (+5)			
	Internet	Telephone	NRFUS
All same answer	4.9%	16.0%	13.8%
4 out 5 same	10.1%	14.8%	17.3%
Response: Neutral (0)			
	Internet	Telephone	NRFUS
All same answer	2.1%	0.1%	1.4%
4 out 5 same	2.5%	1.0%	2.4%
Response: Completely Disagree (-5)			
	Internet	Telephone	NRFUS
All same answer	2.0%	1.1%	1.0%
4 out 5 same	1.6%	0.4%	0.9%

Table 16. Non-differentiation Demonstrated in Attitude Statements

Response: Completely Agree (+5)			
	Internet	Telephone	NRFUS
All same answer	2.2%	9.6%	11.3%
4 out 5 same	4.1%	11.3%	15.2%
Response: Neutral (0)			
	Internet	Telephone	NRFUS
All same answer	0.9%	0.0%	0.2%
4 out 5 same	1.1%	0.0%	0.6%
Response: Completely Disagree (-5)			
	Internet	Telephone	NRFUS
All same answer	0.1%	0.0%	0.0%
4 out 5 same	0.4%	0.0%	0.5%