

The Causes and Consequences of Response Rates in Surveys by the News Media and Government Contractor Survey Research Firms¹

Q1

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On October 13, 1998, columnist Arianna Huffington wrote: "It's no wonder that the mushrooming number of opinion polls, coupled with the outrageous growth of telemarketing calls, have led to a soaring refuse-to-answer rate among people polled" (The New York Post, p. 27). And Huffington has not been alone in expressing this view: numerous survey researchers have shared her sense that response rates have been dropping in recent years, supported by solid data documenting this trend (e.g., de Heer, 1999; Steeh et al., 2001; Tortora 2004; Curtin et al., 2005). As a result, researchers have been increasingly inclined to implement data collection strategies to combat this trend, including longer field periods, increased numbers of call attempts, sending advance letters, offering incentives, attempting refusal conversions, and more (de Heer, 1999; Curtin et al., 2000, 2005).

These efforts have been inspired by a concern about the quality of survey data, because conventional wisdom presumes that higher response rates assure more accurate results (Backstrom and Hursh, 1963; Babbie, 1990; Aday, 1996; Rea and Parker, 1997), and response rates are often used to evaluate survey data quality (Atrostic et al., 2001; Biemer and Lyberg, 2003). Generalizing the results of a survey to the population of interest is based on the assumption that the respondents who provided data are a representative sample of the population. If survey nonresponse (i.e., failure to contact or elicit participation from eligible respondents) creates nonresponse *error* (because respondents differ from nonrespondents), survey estimates of means, proportions, and other population parameters will be biased (Caetano, 2001).

But in fact, it is not necessarily so that lower response rates produce more nonresponse error. Lower response rates will only affect survey estimates if nonresponse is related to substantive responses in a survey. In other words, nonresponse bias will occur if respondents and nonrespondents differ on the dimensions or variables that are of interest to the researchers. But it is quite possible that nonrespondents are sometimes essentially a random subset of a full survey sample, at least random with respect to the variables being measured (if nonresponse is caused by other factors that are uncorrelated with the variables of interest).

When nonresponse produces no bias, strategies to increase response rates may needlessly increase the expense of a survey without increasing data quality. Furthermore, the interviews yielded by many call attempts or by converting refusals may actually produce lower quality reports contaminated by more measurement error, for example, by increasing item nonresponse (Retzer et al., 2004). Therefore, in order to decide how many resources to devote to increasing response rates, it is useful to understand the impact of nonresponse on survey results.

23.1 THE CURRENT INVESTIGATION

The research we describe here was designed to improve understanding of response rates in several ways. First, we surveyed leading survey organizations to explore whether the survey administration procedures being used (e.g., number of call attempts, use of refusal conversions, advance letters, and offering incentives) have changed over time in recent years, perhaps in response to concerns about response

rates. Second, we used an extensive set of more than 100 random digit dialing (RDD) telephone studies conducted over a 10 year period (between 1996 and 2005) by leading survey organizations to get an overall picture of response rates in recent years. Third, we used a subset of these studies that involved the same topic, same interview length, same sponsor and conducting organization, and same methodology to assess whether response rates have changed between 1996 and 2003.

Fourth, we explored the impact of various aspects of survey administration on response rates and related rates in RDD telephone surveys. To complement past studies of the impact of individual survey administration strategies (e.g., refusal conversions, increased call attempts, incentives, and advance letters) one at a time in experiments (e.g., Singer et al., 1999), we explored whether the use of particular survey administration procedures affects response rates and other rates in a multivariate, correlational, observational (nonexperimental) statistical analysis.

Q2

Finally, we gauged the extent to which response rates affect survey data accuracy. Specifically, we assessed whether lower response rates are associated with less demographic representativeness of a sample.

We begin below by defining response, contact, cooperation, and refusal rates, on which our analyses will focus. Then we review the findings of past studies examining telephone surveys on the issues we will explore. Next, we describe the data we collected to assess the effects of survey administration procedures and changes in these procedures over time, and the consequences of response rates for demographic representativeness. We then describe the results of our analyses, discuss their limitations, and discuss the implications of our findings for survey research practice.

23.2 DEFINITIONS

The response rate for an RDD survey is the proportion of eligible households with whom interviews are completed (we used AAPOR's response rate 3). Response rates are a function of two different aspects of the interaction with respondents: *contacting* respondents and gaining their *cooperation*. The processes of contacting respondents and gaining their cooperation involve very different strategies. As such, researchers are often interested in separating the influence of contact and cooperation, and separate contact and cooperation rates can be calculated. For an RDD survey, the contact rate is defined as the proportion of eligible households in which a housing unit member was reached (we used AAPOR's contact rate 2). The cooperation rate is the proportion of successfully contacted households from which an interview is obtained (we used AAPOR's cooperation rate 1).

These separate rates help researchers interested in increasing response rates (or those concerned about low response rates) to determine the extent to which contact and cooperation each contribute to response rates and to tailor strategies to increase response rates that target contact (e.g., increased number of call attempts) or cooperation (e.g., offering an incentive). Response rates are also decreased when potential respondents refuse to participate in surveys, and strategies such as refusal conversions target this particular problem. The refusal rate for an RDD survey is the

proportion of eligible households that refuse to participate (we used AAPOR's refusal rate 2). Although one might imagine that the refusal rate is 100 percent minus the cooperation rate, the refusal rate is in fact the proportion of *all eligible households* in which a refusal occurred, whereas the cooperation rate is the proportion of *all contacted households* that yielded an interview.

23.3 ANTECEDENTS AND CONSEQUENCES OF RESPONSE RATES

23.3.1 Survey Administration Procedures and Response Rates

As a survey is constructed and conducted, researchers must make many decisions about how to conduct the survey. These decisions include

- (1) the purpose of the survey (e.g., whether it is for news media release or not),
- (2) whom to interview (e.g., whether the sample will be from the nation as a whole or from a single state or region, whether list-assisted sampling will be used to generate telephone numbers, the method for choosing a household member to interview, interviewing in languages other than English),
- (3) whether to attempt to provide information about the study to respondents prior to initial interviewer contact with the respondent (e.g., via advance letters or messages left on answering machines),
- (4) the amount of effort to be made to contact respondents (e.g., the field period length and maximum number of contact attempts),
- (5) whether to attempt to persuade respondents to participate (e.g., by offering incentives or attempting to convert refusals),
- (6) procedural aspects that affect respondent burden (e.g., the length of the survey, allowing respondents to make appointments and to initiate contact to be interviewed).

A researcher's decisions on these issues are usually driven by the purpose of the survey and the resources available to conduct it.

Many researchers have explored how survey administration procedures affect RDD telephone survey response rates. This research has been used, in part, to identify procedures that effectively maximize response rates (e.g., Frankovic 2003; **Q3** Brick, et al., 2003). We offer a brief, partial review of this literature next, along with our hypotheses about the potential impact of various design features.

23.3.1.1 Whom to Interview

List-assisted samples. To increase efficiency and maximize calls to working residential numbers, many telephone surveys today use list-assisted samples in which calls are made only in 100-banks of numbers with at least one residential listing (called "1+ banks"; Casady and Lepkowski, 1993; Tucker et al., 2002), two or more listed residential numbers ("2+ banks"), or three or more listed residential numbers ("3+ banks"). However, using list-assisted samples may have costs for sample

representativeness, because numbers from banks that do not meet the requirement (i.e., banks with very few or no listed telephone numbers) are not included in the sample. If the characteristics of households in these banks differ from those included in the sample, the use of list-assisted sampling could bias the representativeness of the survey sample (Giesbrecht et al., 1996) while increasing the response rate and increasing administration efficiency.

Within-household respondent selection. When conducting an RDD telephone survey, researchers are usually interested in obtaining a random sample of the population of *people* rather than a random sample of households. In order to do this, interviewers select one household member using one of various techniques (see Rizzo et al., 2004a; Gaziano, 2005, for reviews). Acquiring a roster of all eligible members of the household permits randomly selecting one person to be interviewed, yielding equal probability of selection. Less invasive quasi-probability and nonprobability techniques are also sometimes used to select an adult from all those in the household. For example, some techniques involve asking for the adult in the household who had the most recent birthday. Still other techniques involve asking for the person *at home* with the next or last birthday or asking first for the youngest male at home and then for the oldest female at home if no male is available. An even less burdensome procedure involves interviewing any knowledgeable adult. Although some studies have found significantly higher cooperation rates or completion rates (i.e., the number of completes divided by the number of completes plus refusals) when using less intrusive quasi-probability and nonprobability selection methods than when using more intrusive probability methods (e.g., O'Rourke and Blair, 1983; Tarnai et al., 1987), others have found no significant differences in cooperation or completion rates between these respondent selection techniques (e.g., Oldendick et al., 1988; Binson et al., 2000).

Spanish interviewing. The Latino population is one of the fastest growing ethnic groups in the United States, making it increasingly tempting for survey researchers to translate survey interviews into Spanish and to have bilingual interviewers. Having bilingual interviewers who can conduct the interview in Spanish may increase response rates because they minimize the number of eligible respondents who cannot be interviewed due to language barriers. Spanish interviewing may also reduce the perceived burden of responding for respondents who are bilingual but have difficulty with English.

23.3.1.2 Attempts to Provide Additional Information

Advance letters. Researchers sometimes send advance letters without incentives to tell respondents about the survey sponsor, topic, and purpose. In RDD telephone surveys, this cannot be done for the entire sample, because (1) researchers cannot typically get mailing addresses for all the RDD telephone numbers,² (2) only a portion of

²The proportion of listed RDD sample telephone numbers varies greatly in published reports, from less than 40 percent to more than 70 percent (e.g., Traugott et al., 1987; Brick et al., 2003b), and may vary based on factors such as the geographic area being surveyed, the extent to which the sample has been cleaned to eliminate nonworking or disconnected numbers, and the recency with which the sample has been updated by the company that provided it.

the people who receive the advance letter read it, and (3) the household member who reads the advance letter may not be the same person who answers the telephone. For example, in studies involving lists of respondents for whom addresses were known, only about three quarters of respondents reported that they had received an advance letter (Traugott et al., 1987). Experimental studies suggest that people who receive advance letters are more likely to participate in a survey and less likely to refuse than those who do not (Dillman et al., 1976; Traugott et al., 1987; Camburn et al., 1995; Smith et al., 1995; Hembroff et al., 2005; Link and Mokdad, 2005a).

Messages on answering machines. Now that answering machines and voicemail are ubiquitous (see Roth et al., 2001), interviewers can choose to leave messages on answering machines, or they may forego this opportunity. An answering machine message may act as a form of an advance letter to give potential respondents information about the survey and to increase the perceived legitimacy of the project. However, answering machine messages may not be effective if respondents do not remember them at the time of later contact by an interviewer, and repeated answering machine messages may be irritating to potential respondents, thus reducing participation.

Experimental tests of the effects of answering machine messages have produced mixed results. Some evidence suggests that answering machine messages increase reported willingness to participate (Roth et al., 2001) and participation (Xu et al., 1993), particularly if repeat messages are not left (Tuckel and Shukers, 1997). Other researchers have found no effect of leaving answering machine messages on participation (Tuckel and Schulman, 2000; Link and Mokdad, 2005b). Messages explaining that the interviewer is not selling anything may be especially effective (Tuckel and Shukers 1997), but providing information about university sponsorship, the importance of the research, a monetary incentive, or a number respondents can call to complete the survey may not increase response rates more than a basic introductory message without such information (Xu et al., 1997; Tuckel and Schuman, 2000).

Q4

23.3.1.3 General Contact Effort

Field period length. The length of the field period is the number of days during which interviewing is conducted. Longer field periods may increase the probability of contact, because respondents are less likely to never be available (e.g., be out of town or ill) during a longer field period. Some studies indicate that longer field periods are associated with higher response rates (e.g., Groves and Lyberg, 1988; Keeter et al., 2000).

Maximum number of call attempts. One aspect of survey administration is the maximum number of times that interviewers attempt to reach each household, after which the telephone number is retired from the active sample. Higher maximum numbers of call attempts have been found to be associated with higher response rates in some studies (e.g., O'Neil, 1979; Massey et al., 1981; Traugott, 1987; Merkle et al., 1993). This effect is not linear; each additional call attempt increases response rates less than the previous attempt does.³

³The timing of calls (across time of day and days of the week) may also influence their success (e.g., Cunningham et al., 2003).

23.3.1.4 *Direct Efforts to Persuade and Gain Compliance*

Q2 *Incentives.* Many studies have shown that offering respondents material incentives for participation increases response rates (e.g., Yu and Cooper, 1983; Singer et al., 1999; Singer et al., 2000). Typically, cash incentives have been more effective than other material gifts, and prepaid incentives (provided before respondents complete the interview) are usually more effective than promised incentives (to be provided after an interview is completed; Singer et al., 1999). Prepaid incentives may be particularly effective because they invoke the norm of reciprocity (Dillman, 1978; Groves et al., 1992).

Q3 *Refusal conversion.* If a potential respondent initially refuses to be interviewed, a “refusal conversion” interviewer can call back sometime later to attempt to convince the individual to complete the survey. If refusal conversion interviewers are at least sometimes successful at obtaining completed interviews, they will increase a survey’s response and cooperation rates, and recent evidence suggests that response rates in studies would be substantially lowered (5–15 percentage points) if refusal conversions were not done (Curtin et al., 2000; Montaquila et al., Chapter 25 in this volume) and that 7–14 percent of refusals are successfully converted to completed interviews when refusal conversions are attempted (e.g., Brick, et al., 2003; Retzer et al., 2004).

Convenience and respondent burden. Interview length. Conventional wisdom suggests that people are less likely to agree to participate in a survey that is longer because of the increased burden. Most potential respondents do not know how long a survey will be at its start, which presumably minimizes any impact of interview length on participation, but interviewers may subtly communicate the length of the survey even if it is not mentioned. In one study that manipulated the stated length of a survey, respondents told the interview would be 40 minutes were more likely to refuse to participate than those told the interview would be only 20 minutes (Collins et al., 1988).

Appointments and respondent-initiated contact. Organizations sometimes allow interviewers to make appointments with respondents to be interviewed at a later time, and some organizations allow respondents to call in to make an appointment or to complete an interview. These procedures allow the survey organization to use resources more efficiently to contact respondents more easily and allow greater convenience for respondents, and may therefore increase response rates (e.g., Collins et al., 1988).

23.3.2 *Effects of Response Rates on the Accuracy of Survey Results*

Methods for assessing effects of response rates on accuracy. A great deal of research has explored the impact of nonresponse on telephone survey results by assessing whether respondents and nonrespondents differ from one another (see Groves and Couper, 1998 for a review). This has been done by (1) conducting a follow-up survey to interview people who did not respond to the initial survey (e.g., Massey et al., 1981), (2) comparing the wave-one characteristics of respondents who were and were not lost at follow-up waves of interviewing in panel studies (e.g., Schejbal

and Lavrakas, 1995), (3) comparing early versus late responders to survey requests (under the assumption that late responders are more similar to nonresponders than early responders; e.g., Merkle et al., 1993), (4) comparing people who refuse an initial survey request to those who never refuse (e.g., O'Neil, 1979; Retzer et al., 2004), (5) using archival records to compare the personal and/or community characteristics of households that do and do not respond to survey requests (e.g., Groves and Couper, 1998), and (6) comparing the characteristics of respondents in an RDD survey sample to those of the population as a whole (e.g., Mulry-Liggan, 1983; Keeter et al., 2000).

Many of these studies have focused on the relation of nonresponse to the demographic characteristics of the samples, and some have tested whether nonresponse is related to substantive survey responses. However, there are reasons to hesitate about generalizing evidence from some of these approaches to nonresponse in a cross-sectional survey. For example, nonresponse in panel studies after the first wave is not the same phenomenon as nonresponse in the initial wave of such a survey. Similarly, reluctant respondents and late responders may not be the same as nonrespondents.

Some of the most direct evidence about nonresponse bias comes from research comparing responses from similar surveys that achieved different response rates (e.g., Traugott et al., 1987; Keeter et al., 2000; Groves et al., 2004b). For example, Keeter et al. (2000) varied the amount of effort put into obtaining high response rates in two surveys with identical survey questionnaires by manipulating the field period length, extent of refusal conversion attempts, and number of call attempts. As a result, one survey had a much higher response rate than the other. Demographic representativeness and substantive survey responses could then be compared to assess the effects of response rates on them.

Findings regarding demographic characteristics. Some past studies indicate that respondents and nonrespondents had different demographic characteristics, so the survey samples were unrepresentative of the population. But in every case, the body of evidence is actually quite mixed.

For example, some evidence indicates that women were overrepresented in RDD surveys relative to the population (Chang and Krosnick, 2001). Consistent with this, researchers have found that males were more difficult to contact than females (Traugott, 1987; Shaiko et al., 1991; Merkle et al., 1993) and that males were more difficult to find for later waves of a panel survey (Schejbal and Lavrakas, 1995). However, Keeter et al. (2000) found that the proportion of men and women did not differ between survey samples with different response rates. Similarly, Mulry-Liggan (1983) found no difference in the proportion of men and women in an RDD survey sample relative to that in the population. And Retzer et al. (2004) found no significant difference in the rate of refusal conversions among male and female respondents.

Some evidence also suggests that respondents and nonrespondents sometimes differ in terms of income. One study found that an RDD survey sample included more high-income respondents and fewer low-income respondents than the population (Chang and Krosnick, 2001). Consistent with this, panel surveys suggest that lower income respondents may be more difficult to locate for later waves (e.g., Schejbal and Lavrakas, 1995). Some panel survey follow-up studies have found that

lower income respondents were more likely to refuse telephone survey requests (e.g., O'Neil, 1979). However, other researchers have found no differences in the income levels of respondents interviewed via refusal conversions and those who did not initially refuse (e.g., Retzer et al., 2004). And in a comparison of surveys with different response rates, the survey with the higher response rate underrepresented low-income respondents more than the survey with the lower response rate (e.g., Keeter et al., 2000).

Respondents of different races may also respond at different rates to telephone surveys. For example, some evidence suggests that RDD survey samples may underrepresent racial minorities, particularly African American respondents (Chang and Krosnick, 2001), although there is some evidence that other racial minority groups may be overrepresented (Mulry-Liggan, 1983; Chang and Krosnick, 2001). White respondents have been underrepresented in some surveys (e.g., Keeter et al., 2000; Chang and Krosnick, 2001), overrepresented in others (e.g., Green et al., 2001), and accurately represented in others (e.g., Mulry-Liggan, 1983). In a comparison of surveys with different response rates, the one with the higher response rate resulted in less underrepresentation of white respondents than the one with a lower response rate (Keeter et al., 2000). However, evidence from studies examining difficult to reach respondents suggests that nonwhites may be more difficult to contact than whites (Merkle et al., 1993; Traugott, 1987) and more difficult to find for later waves of a panel survey (Schejbal and Lavrakas, 1995). Other studies found no significant racial differences between respondents who were interviewed as a result of refusal conversions and those who did not initially refuse (e.g., Retzer et al., 2004).

Education was also found to be related to likelihood of responding in some telephone surveys. Some studies documented underrepresentation of low education respondents and overrepresentation of high education respondents (e.g., Mulry-Liggan, 1983; Chang and Krosnick, 2001). Likewise, some researchers have found that more educated people are easier to locate for later waves of a panel survey (Schejbal and Lavrakas, 1995) and less likely to be interviewed as a result of a refusal conversion (O'Neil, 1979; Retzer et al., 2004). However, other studies have found that more educated people require more call attempts (Merkle et al., 1993), and that surveys with higher response rates may overrepresent high education respondents *more* than surveys with lower response rates (Keeter et al., 2000).

Compared to the population, RDD studies have sometimes underrepresented the youngest (Chang and Krosnick, 2001) and oldest adults (Mulry-Liggan, 1983; Chang and Krosnick, 2001). Older adults (those 65 and older) are easier to contact (Traugott, 1987; Shaiko et al., 1991; Merkle et al., 1993), perhaps because they are less likely to work and therefore more likely to be at home. Older people are also easier to locate for later waves of panel surveys (Schejbal and Lavrakas, 1995), perhaps because they are more tied to the community and less likely to move between waves of panel surveys. However, considerable evidence also suggests that older people may be more likely to refuse to be interviewed and may make up a larger proportion of respondents who require a refusal conversion than respondents who do not (O'Neil, 1979; Massey et al., 1981; Struebbe et al., 1986; Retzer et al., 2004).

Findings regarding responses to substantive questions. Nearly all research focused on substantive variables has concluded that response rates are unrelated to or only very weakly related to the distributions of substantive responses (e.g., O'Neil, 1979; Smith, 1984; Merkle et al., 1993; Curtin et al., 2000; Keeter et al., 2000; Groves et al., 2004; Curtin et al., 2005). For example, comparing two similar surveys with different response rates, Keeter et al. (2000) found statistically significant differences for only 14 of 91 items they compared. Although this is larger than the proportion that would be expected by chance alone, the 14 differences were all small in magnitude. Other surveys have found comparably small effects of response rates on substantive responses (O'Neil, 1979; Smith, 1984; Merkle et al., 1993; Curtin et al., 2000; Groves et al., 2004; Curtin et al., 2005).

23.4 METHODS

Thus, the evidence accumulated provides little support for the idea that response rates in telephone surveys are associated with the distributions of substantive survey responses and mixed evidence as to whether low response rates are associated with reduced demographic representativeness. To further explore the causes and effects of nonresponse, we contacted 14 major survey data collection organizations who agreed to provide information about their RDD telephone procedures and information about specific surveys: ABC News, Abt Associates, CBS News, the New York Times, the Gallup Organization, the Kaiser Family Foundation, the Los Angeles Times, Mathematica Policy Research, Inc., the Pew Research Center for the People and the Press, the RAND Corporation, Research Triangle Institute, Schulman, Ronca, Bucuvalas, Inc., the Washington Post, and Westat. These organizations come from two broad classes: ones that primarily conduct surveys with short data collection periods for news media release, and ones that primarily conduct surveys with much longer data collection field periods that are often sponsored by government agencies. All surveys we examined involved data collected by or for one or more of these organizations. In some cases, organizations cosponsored a survey, or one organization designed and directed the research and subcontracted data collection to another organization.

23.4.1 Changes in Survey Administration Procedures Over Time

From each organization, we requested the name of their field director or a person at their organization who could tell us about changes in survey administration procedures in recent years. For organizations that did not collect their own data, we obtained contact information for a person who could answer questions about changes in survey administration procedures over time at the organization that did their data collection. Because some surveys involved the collaboration of several organizations and because the same subcontractor did the data collection for multiple organizations, there is not a one-to-one association between these individuals and the 14 organizations initially contacted. We identified 12 such people, to whom we sent them a questionnaire asking about differences in survey administration procedures

between 2000 and 2004. Ten respondents provided data to us. The other two organizations did not conduct any RDD surveys in one of these years and therefore could not answer our questions.

23.4.2 RDD Study Methodologies and Response Rates

From each organization, we requested information about recent general population RDD surveys they had conducted. We requested three types of information about each survey: (1) frequencies for final disposition codes, (2) unweighted demographic distributions for all people who responded to the questionnaire, and (3) information about the survey administration procedures.

Information about surveys was collected in three phases. In January of 2003, we contacted 12 organizations and requested information about survey administration procedures for up to five national and five state-level RDD general population surveys that were in the field for at least 3 days. For organizations that conducted a large number of these surveys, we requested that they send us information about the five surveys conducted nearest the beginning of the last five quarters (starting 1/1/02, 4/1/02, 7/1/02, 10/1/02, and 1/1/03). These requests yielded disposition code frequencies and survey administration information for 49 surveys and unweighted demographic distributions for 27 of these surveys (starting 1/1/04, 4/1/04, 7/1/04, 10/1/04, and 1/1/05). In February of 2005, we contacted six organizations (five of the organizations contacted in January, 2003, and one new organization) and requested disposition code frequencies, information about survey administration procedures, and unweighted demographic frequencies for recent general population RDD telephone surveys that were in the field for at least 3 days. We asked especially for national surveys but said we would accept general population surveys of state and regional samples as well. This request yielded disposition code frequencies, and survey administration procedure information for an additional 22 surveys and unweighted demographic frequencies for 18 of these surveys. One additional organization was contacted and asked for disposition code frequencies, unweighted demographic frequencies, and information about survey administration processes for all general population RDD surveys for which the organization had records. This request yielded disposition code frequencies and survey administration information about an additional 43 surveys and unweighted demographic frequencies for 36 of these surveys.

In total, we received usable disposition code frequencies for 114 RDD surveys conducted between 1996 and 2005, which we used to gauge the relations between survey administration procedures and response, contact, cooperation, and refusal rates. Of these, 90 were national surveys (either all 50 states or the contiguous United States), 19 were surveys of samples within a single state, and five involved some other sort of more limited geographic area (e.g., city, county, or metropolitan area). We included surveys of a state or region in these analyses to maximize sample size and because doing so reduced the extent to which survey administration procedures were confounded with one another. Our analyses examining the effect of survey administration variables controlled for mean differences in rates between national

and nonnational surveys, and we also repeated all analyses with only the national surveys to see whether the results differed notably.

Of the 90 national surveys, unweighted demographic frequencies were provided for 81 of them. For three surveys, the disposition codes were for RDD screeners for surveys that dealt with special populations of respondents. In these cases, demographic information was not collected from all screened respondents, and could therefore not be used in our research. For the remaining 6 surveys, demographics were not provided.

Among the 90 national surveys, 26 were surveys conducted on the same topic by the same organization using the same methodology between 1996 and 2003. We used these 26 surveys to more directly assess changes in response, contact, cooperation, and refusal rates over this time period.

Study characteristics. For each survey, we asked the organization about its administration procedures, including whether the survey involved a national, state, or regional sample, the type of sample used (e.g., all working blocks versus all blocks with at least two listed residential numbers), the respondent selection technique used, the languages in which the interviewing was conducted, whether advance letters were sent, whether answering machine messages were left, the field period length, the maximum number of call attempts, the use of incentives and refusal conversions, and procedures for making appointments and allowing respondents to contact the survey organization (see Tables 23.1 and 23.2 for a list of these variables and descriptive statistics). We used this information to assess the impact of survey administration procedures on response rates.

We also created a variable indicating which organization contributed the data. Because surveys from the same organizations are not fully independent of one another (and therefore may be more similar than surveys from different organizations), it would be ideal to control for organization in our analyses, if possible. But doing so meaningfully requires sufficient independence of survey organization from the implementation procedure variables. We conducted all analyses with and without controlling for survey organization to assess the plausibility of that approach.

23.4.3 Calculating Response, Cooperation, Contact, and Refusal Rates

Final disposition code frequencies were used to estimate AAPOR response rate 3, contact rate 2, cooperation rate 1, and refusal rate 2 using the AAPOR response rate calculator available online (www.aapor.org). The response, contact, and refusal rates we used include a portion of unknown eligibility cases with those known to be eligible, using the proportion e . We chose to use the CASRO method of estimating e because it could be applied equivalently across studies and did not require additional methodological information about the studies that we did not have. This method results in a conservative estimate of e (i.e., this procedure likely overestimates e and underestimates response rates). The estimates of e for the surveys we examined are likely to be relatively high, because the bulk of the

Table 23.1. Descriptive Statistics for Continuous Variables

Variable	Mean	Standard deviation	Minimum	Maximum	<i>N</i>
Rates					
Response rate	0.30	0.13	0.04	0.70	114
Contact rate	0.67	0.13	0.33	0.92	114
Cooperation rate	0.44	0.15	0.09	0.84	114
Refusal rate	0.29	0.09	0.04	0.55	114
<i>e</i>	0.55	0.13	0.26	0.84	114
Demographic discrepancies (in %)					
Gender ^a	2.30	2.94	0.00	17.33	71
Income	3.00	1.88	0.60	10.93	74
Race	2.99	3.08	0.40	24.90	80
Education	5.68	2.21	1.10	11.08	81
Age	2.20	1.26	0.37	5.90	81
Continuous survey administration procedures					
General efforts to contact					
Field period length (in days)	35.76	64.41	2.00	399.00	113
Maximum number of call attempts ^b	8.46	4.03	3.00	20.00	69
Convenience and respondent burden					
Interview length (in minutes)	16.91	7.04	3.50	34.00	89
Survey organization variables					
Number of surveys per organization	10.31	10.93	1	43	114

^aTen surveys conducted by two organizations that used gender quotas were excluded from estimates of gender discrepancies.

^bFor seven surveys, no maximum number of calls was set; these are excluded from the statistics in the last row of this table.

Q5

surveys were for media release and involved fairly short field periods, which leads to high estimates of *e* (Smith, 2003). Whenever we were uncertain about the correspondence between the disposition codes used by an organization and the AAPOR codes, we worked with the organization to assign cases the most appropriate AAPOR codes.

23.4.4 Demographic Representativeness

Unweighted demographic data for age, race, gender, income, and education were compared to data from the Current Population Survey March Demographic Supplement from the year in which the target survey was conducted. For each demographic variable, the demographic discrepancy was the average of the absolute value of the

Table 23.2. Descriptive Statistics for Categorical Survey Administration Procedures

Procedure	Value	Number of surveys	Percent
Purpose of survey			
News media release	For media release	92	80.70
	Not for media release	22	19.30
	Missing	0	0.00
Whom to interview			
Geographic area	National (all 50 states or lower 48)	90	78.95
	Not national (state or region)	24	21.05
	Missing	0	0.00
List-assisted sampling	All blocks	6	5.26
	All working blocks (1+ listed)	17	14.91
	All working blocks (2+ listed)	20	17.54
	All working blocks (3+ listed)	56	49.12
	Missing	15	13.16
Respondent selection technique	Any adult at home	3	2.63
	Youngest male/oldest female at home	52	45.61
	Last/next birthday at home	17	14.91
	Last/next birthday all adult residents	21	18.42
	Modified Kish	8	7.02
	Other	12	10.53
	Missing	1	0.88
	Spanish interviewing	Yes	28
No	76	66.67	
Missing	10	8.77	
Attempts to provide additional information			
Sent advance letters	Yes	14	12.28
	No	95	83.33
	Missing	5	4.39
Answering machine messages	Never leave messages	81	71.05
	Sometimes leave messages	14	12.28
	Always leave messages	1	0.88
	Missing	18	15.79
Direct efforts to persuade and gain compliance			
Incentives offered	Yes	8	7.02
	No	101	88.60
	Missing	5	4.39
Refusal conversions	Yes	95	83.33
	No	14	12.28
	Missing	5	4.39

Table 23.2. (Continued)

Procedure	Value	Number of surveys	Percent
Convenience and respondent burden			
Made appointments with any household member	Yes	34	29.82
	No	68	59.65
	Missing	12	10.53
Respondent could call to make appointment	Yes	14	12.28
	No	88	77.19
	Missing	12	10.53
Respondent could call to complete interview	Yes	13	11.40
	No	88	77.19
	Missing	13	11.40

discrepancies between the survey data proportion and the current population survey (CPS) proportion for all the response categories of that variable.⁴

23.5 RESULTS

23.5.1 Changes in Survey Administration Procedures 2000–2004

23.5.1.1 Whom to Interview

Sampling. Five organizations reported no changes in their sampling procedures. One organization reported a greater use of listed numbers (rather than RDD) in 2004 than in 2000, and two organizations reported more cleaning or screening of numbers in 2004 than in 2000.

Within-household respondent selection. Nine organizations reported no changes in respondent selection techniques. One organization reported changing from oldest male/youngest female at home in 2000 to last birthday by 2004.

Spanish interviewing. Two organizations did not interview in Spanish. Three others that did so reported no change in Spanish interviewing between 2000 and 2004. Four organizations reported that they conducted more interviews in Spanish in 2004 than in 2000. One organization reported conducting Spanish interviews in fewer surveys in 2004 than in 2000, but conducting the same proportion of interviews in Spanish in those surveys in 2000 and 2004.

⁴Coding of demographic variables was done as consistently as possible across surveys. Gender was coded male and female. Race was coded white, black, and other races. Education was coded less than high school education, high school education (or GED), some college, and 4-year college degree or more. The original coding of age and income varied widely, so it was impossible to code them identically across all surveys. Age was always coded into six categories, but the specific categories varied across the surveys. Income was coded into 4 or 5 categories and was coded as similarly as possible.

23.5.1.2 Attempts to Provide Additional Information

Advance letters. Seven organizations did not use advance letters. The other three organizations all reported that they sent advance letters in more studies in 2004 than in 2000. One organization reported that when advance letters were sent, addresses were available for a greater proportion of sample in 2004 than in 2000. No other changes in the use of advance letters were reported.

Answering machine messages. No organizations reported any changes in their procedures regarding leaving messages on answering machines.

23.5.1.3 General Contact Effort

Field period length. One of the 10 organizations reported longer field periods in 2004 than in 2000. All others reported no change.

Maximum number of call attempts. Four organizations reported changes in their call attempts between 2000 and 2004. Two reported that the average and maximum number of call attempts was greater in 2004 than in 2000, and two reported that the average (but not maximum) number of call attempts was greater in 2004 than in 2000. No organizations reported making fewer call attempts in 2004 than in 2000.

23.5.1.4 Direct Efforts to Persuade and Gain Compliance

Incentives. Seven organizations did not offer incentives. Of the remaining three, one reported no change, one reported using incentives in more studies in 2004 than in 2000, but no change in the amount of incentives offered between 2000 and 2004, and the last reported using incentives in more studies in 2004 than in 2000 and incentives of larger size in 2004 than in 2000.

Refusal conversions. Two organizations did not do refusal conversions. Of the remaining eight, five reported no change in the procedures for refusal conversions or the proportions of refusals that were followed up by conversion attempts. One organization reported that the number of refusals for which conversions were attempted was higher in 2004 than in 2000. Another organization reported that the number of conversion attempts for each refusal was greater in 2004 than in 2000, and the final organization reported attempting refusal conversions with a larger proportion of refusals in 2004 than in 2000, and making more refusal conversion attempts per refusal in 2004 than in 2000.

23.5.1.5 Convenience and Respondent Burden

Interview length. One of the ten organizations reported longer interviews in 2004 than in 2000. All others reported no change.

Appointments and respondent-initiated contact. No organizations reported any changes in their procedures regarding making appointments with respondents or other household members, or their procedures regarding allowing respondents to call the survey organization to make an appointment or to complete an interview.

23.5.1.6 Summary

Overall, few changes in survey administration procedures were made by these organizations. The changes that were made involved more use of techniques to increase

response rates (e.g., increasing number of call attempts, refusal conversions, more, and larger incentives) in 2004 than in 2000.

23.5.2 Response, Contact, Cooperation, and Refusal Rates

Descriptive statistics for response, contact, cooperation, and refusal rates and the value of e are shown in the top panel of Table 23.1. Response rates varied from 4 percent to 70 percent and averaged 30 percent. Contact rates ranged from 33 percent to 92 percent and averaged 67 percent. Cooperation rates ranged from 9 percent to 84 percent and averaged 44 percent. Refusal rates ranged from 4 percent to 55 percent and averaged 29 percent. The estimate of e varied from 0.26 to 0.84 and averaged 0.55, which are similar to those reported in previous work (e.g., Smith, 2003).

Contact and cooperation rates were related to response rates as one would expect. Cooperation rates were highly significantly and positively correlated with response rates ($r = 0.89, p < 0.001, N = 114$). Contact rates were also highly significantly and positively correlated with response rates, but more weakly ($r = 0.62, p < 0.001, N = 114$). So the variation in response rates across studies is attributable mostly to cooperation rates and less to contact rates. Refusal rates were negatively associated with cooperation ($r = -0.45, p < 0.01, N = 114$) and response rates ($r = -0.20, p < 0.05, N = 114$), and positively associated with contact rates ($r = 0.52, p < 0.001, N = 114$). This is consistent with existing evidence that increased contact provides greater opportunities for respondents to refuse (Brick et al., 2003; Sangster and Meekins, 2004).

Q3

23.5.3 Changes in Response Rates Over Time 1996–2003

The correlation between the year (1996–2005) in which a survey went into the field and its response rate was negative and highly significant ($r = -0.38, p < 0.001, N = 113$), indicating that later surveys had lower response rates. Some of this trend could be attributable to changes in survey administration procedures over time (although this seems unlikely given the changes in survey administration procedures described in the previous section), or to the fact that some organizations gave us data from surveys conducted only during certain segments of the time interval and not others (thus confounding organization with time). We therefore examined 26 surveys conducted, between December 1996 and October 2003, by a single organization identical in terms of length and topic with very consistent survey administration procedures. Although the length of the field period in these surveys varied from 3 to 14 days, field period length was not related to response, contact, cooperation, or refusal rates. Additionally, none of the results regarding over-time changes were affected by controlling for length of field period. Date of survey was coded as the number of months after January 1996 that the survey went into the field.

Date of the survey and response rate were strongly negatively correlated ($r = -0.70, p < 0.001, N = 26$). This suggests that response rate decreased by two tenths of a percent each month during this time period. Although this is a small change, over the 82 month time period in which these studies were conducted, this regression suggests response rates dropped 16.4 percent, a dramatic decrease.

We also explored how contact rates, cooperation rates, and refusal rates changed over time. Contact rates ($r = -0.61, p < 0.001, N = 26$) and cooperation rates ($r = -0.47, p < 0.001, N = 26$) dropped significantly during this time period. Interestingly, refusal rates were not significantly associated with date of survey ($r = -0.07$, not significant, $N = 26$), consistent with evidence that refusal rates may not have been changing over time where cooperation and contact rates were (e.g., Brick et al., 2003).

23.5.4 Survey Administration and Response Rates

23.5.4.1 Bivariate Analyses

Purpose of the survey. Surveys that were intended for news media release had response rates 6 percent lower on average than those that were not intended for news media release ($b = -0.06, p < 0.05$; see row 1 of column 1 in Table 23.3). This difference was a function of lower contact rates ($b = -0.12, p < 0.05$) and higher refusal rates ($b = -0.04, p < 0.10$), but not lower cooperation rates ($b = -0.03$, not significant; see row 1 of columns 2, 3, and 4 in Table 23.3, respectively).

Whom to interview. Response rates for national surveys were significantly higher than those for state or regional surveys ($b = 0.09, p < 0.01$; see row 2 of column 1 in Table 23.3). This effect was primarily due to greater cooperation in national surveys ($b = 0.11, p < 0.01$), and not to differences in contact rates ($b = 0.03$, not significant) or refusal rates ($b = -0.002$, not significant); see row 2 of columns 2, 3, and 4 in Table 23.3).

Using list-assisted samples (instead of pure RDD samples) was associated with higher response rates ($b = 0.14, p < 0.01$), contact rates ($b = 0.10, p < 0.01$), and cooperation rates ($b = 0.19, p < 0.01$), and weakly associated with higher refusal rates ($b = 0.05, p < 0.10$; see row 3 of columns 1–4 in Table 23.3).⁵

Response rates were lower when the respondent selection technique used limited the number of eligible respondents more severely. Interviewing any knowledgeable adult (the baseline group in the regression analysis shown) yielded the highest response rates. Respondent selection techniques that involved selecting an adult from those at home at the time of contact (either using the next/last birthday method or youngest male-oldest female method) had somewhat lower response rates ($b = -0.20, p < 0.01$; $b = -0.25, p < 0.01$; see rows 4 and 5 of column 1 in Table 23.3), and techniques that involved selecting a respondent from among all adult residents of the household (either using the next/last birthday method or a modified Kish method) had the lowest response rates ($b = -0.34, p < 0.01$; $b = -0.35, p < 0.01$; see rows 6 and 7 of column 1 in Table 23.3). Surveys that used other respondent selection techniques had

⁵List-assisted sampling was coded 0 if no list assisted sampling was done, 0.33 for surveys using only 1+ listed blocks, 0.67 for surveys using only 2+ listed blocks, and 1 for surveys using only 3+ listed blocks for all regression analyses. The effect of list assisted sampling on response rate was stable across different ways of coding this variable (e.g., a series of dummy variables or a binary variable distinguishing surveys that used list-assisted sampling from those that did not).

Table 23.3. Bivariate Associations of Survey Administration Procedures with Response, Contact, Cooperation, and Refusal Rates (Standard Error in Parentheses)

Procedure	Unstandardized OLS regression coefficients				N
	Response rate	Contact rate	Cooperation rate	Refusal rate	
Purpose of survey					
For news media release	-0.06* (0.03)	-0.12** (0.03)	-0.03 (0.04)	-0.04+ (0.02)	114
Whom to interview					
National survey	0.09** (0.03)	0.03 (0.03)	0.11** (0.03)	-0.002 (0.02)	114
List-assisted sampling ^a	0.14** (0.04)	0.10** (0.04)	0.19** (0.04)	0.05+ (0.03)	99
Respondent selection technique ^b					113
Youngest male/oldest female at home	-0.20** (0.05)	-0.08 (0.06)	-0.18** (0.07)	0.08+ (0.04)	
Last/next birthday at home	-0.25** (0.06)	0.17** (0.06)	0.19** (0.08)	0.05 (0.05)	
Last/next birthday all adult residents	-0.34** (0.05)	-0.23** (0.06)	-0.31** (0.07)	0.03 (0.05)	
Modified Kish	-0.35** (0.06)	-0.16* (0.07)	-0.35** (0.08)	0.17** (0.05)	
Other	-0.28** (0.06)	-0.02 (0.06)	-0.30** (0.08)	0.16** (0.05)	104
Spanish interviewing	0.05+ (0.03)	0.03 (0.03)	0.03 (0.03)	-0.05* (0.02)	
Attempts to provide additional information					
Sent advance letters	0.04 (0.04)	0.17** (0.03)	-0.05 (0.04)	0.09** (0.03)	109
Answering machine messages left ^c	0.11+ (0.07)	0.24** (0.06)	0.04 (0.08)	0.07 (0.05)	96
General contact effort					
Field period length (in days)	0.001** (0.0002)	0.001** (0.0002)	0.0004* (0.0002)	0.001 (0.0001)	113
Maximum number of call attempts ^d	0.005+ (0.003)	0.02** (0.002)	0.001 (0.003)	0.008** (0.002)	76
Direct efforts to persuade and gain compliance					
Incentives offered	0.12* (0.05)	0.11* (0.05)	0.08 (0.06)	0.02 (0.04)	109
Refusal conversions	0.03 (0.04)	0.10** (0.04)	-0.03 (0.04)	0.05+ (0.03)	109

(continued)

Table 23.3. (Continued)

Procedure	Unstandardized OLS regression coefficients				N
	Response rate	Contact rate	Cooperation rate	Refusal rate	
Convenience and respondent burden					
Interview length (in minutes)	-0.006** (0.002)	-0.001 (0.002)	-0.008** (0.002)	0.0005 (0.001)	89
Made appointments with any household member	-0.04 (0.03)	0.01 (0.03)	-0.04 (0.03)	0.05* (0.03)	102
Respondent could call to make appointment	0.04 (0.04)	0.14** (0.04)	-0.02 (0.05)	0.06** (0.03)	102
Respondent could call to complete interview	0.02 (0.04)	0.16** (0.04)	-0.05 (0.05)	0.09** (0.03)	101

^aList-assisted sampling was coded 0 if no list-assisted sampling was done, 0.33 for surveys using only 1+ listed blocks, 0.67 for surveys using only 2+ listed blocks, and 1 for surveys using only 3+ listed blocks for all regression analyses.

^bAny adult at home was used as the comparison group.

^cAnswering machine messages were coded 0 if no answering machine messages were left, 0.5 if they were left some of the time, and 1 if they were always left for all regression analyses.

^dFor regressions involving maximum number of call attempts, surveys that made unlimited calls were given a value of 20, the highest maximum number of calls reported.

** $p < 0.01$.

* $p < 0.05$.

¹ $p < 0.10$.

response rates somewhere between these latter two types ($b = -0.28$, $p < 0.01$; see row 8 of column 1 in Table 23.3). The effects of respondent selection technique on response rates were not only primarily due to lower cooperation rates (see rows 4–8 of column 3 in Table 23.3), but were also somewhat the result of reduced contact rates and higher refusal rates (see rows 4–8 of columns 2 and 4 in Table 23.3).

Surveys that involved interviewing in Spanish had marginally significantly higher response rates than those that did not ($b = 0.05$, $p < 0.10$; see row 9 of column 1 in Table 23.3). Spanish interviewing increased response rates one half of a percentage point on average. Interviewing in Spanish was not associated with contact rates ($b = 0.03$, not significant) or cooperation rates ($b = 0.03$, not significant; see row 9 of columns 2 and 3 in Table 23.3), but did lower refusal rates ($b = -0.05$, $p < 0.05$; see row 9 of column 4 in Table 3), suggesting that the ability of an interviewer to speak Spanish may have been important for avoiding refusals.

Attempts to provide additional information. Surprisingly, sending advance letters did not enhance overall response rates ($b = 0.04$, not significant; see row 10 of column 1 in Table 23.3). Interestingly, advance letters increased contact rates ($b = 0.10$, $p < 0.05$) and refusal rates ($b = 0.05$, $p < 0.10$), and did not affect co-

operation rates ($b = -0.05$, not significant; see row 10 of columns 2, 3, and 4 in Table 23.3). Thus, people for whom an address was available who read the letter may have been easier to contact, perhaps because they were less likely to avoid talking with an interviewer (e.g., by screening calls using an answering machine or caller ID). But among potential respondents who were successfully contacted, advance letters may have provided the opportunity to prepare reasons to refuse to participate.

Leaving messages more frequently was marginally significantly associated with higher response rates ($b = 0.11$, $p < .10$; see row 11 of column 1 of Table 23.3).⁶ Leaving messages on answering machines appears to have increased response rates primarily by increasing contact ($b = 0.17$, $p < 0.01$; see row 11 of column 2), and was not associated with either cooperation rates ($b = 0.04$, not significant) or refusal rates ($b = 0.07$, not significant; see row 11 of columns 3 and 4 in Table 23.3). Leaving an answering machine message may have increased contact by reducing the extent to which respondents screened calls from the survey organization to avoid contact.

General contact effort. Longer field periods were associated with higher response rates ($b = 0.001$, $p < 0.01$; see row 12 of column 1 in Table 23.3); one extra day of calling yielded one tenth of a percentage point increase in response rates. Longer field periods appear to have increased response rates primarily by causing more contact ($b = 0.001$, $p < 0.01$; see row 12 of column 2 in Table 23.3). Field period length was more weakly related to cooperation rate ($b = 0.0004$, $p < 0.05$; see row 12 of column 3 in Table 23.3) and was unrelated to refusal rate ($b = 0.001$, not significant; see row 12 of column 4 in Table 23.3).⁷

A higher maximum number of call attempts was marginally significantly associated with higher response rates ($b = 0.005$, $p < 0.10$; see row 13 of column 1 in Table 23.3). Increasing the maximum number of call attempts by two increased response rates by one half of a percent.⁸ A higher maximum number of call attempts was also associated with higher contact rates ($b = 0.02$, $p < 0.01$; see row 13 of column 2 in Table 23.3) and refusal rates ($b = 0.008$, $p < 0.01$; see row 13 of column 4 in Table 23.3), but not greater cooperation ($b = 0.001$, not significant; see row 13 of column 3 in Table 23.3). A higher maximum number of call attempts may have been

⁶Answering machine messages were coded 0 if no answering machine messages were left, 0.5 if they were left some of the time, and 1 if they were always left. The effect of leaving answering machine messages on response rate was significant if leaving messages was coded as a series of dummy variables, but it was not significant if leaving messages was coded as a binary variable distinguishing surveys that left messages some or all of the time from those that never left messages.

⁷The refusal rate was calculated using calls that were coded as refusals by interviewers and did not include callback and answering machine disposition codes possibly indicating soft refusals, which occur more frequently in surveys with longer field periods (Sangster and Meekins 2004).

⁸In analyses examining the relation of number of callbacks and response rates, surveys with an unlimited number of callbacks were given a maximum number of calls value of 20, the highest maximum number of calls reported.

associated with higher levels of refusals both because greater contact provided more opportunity for respondents to refuse and because researchers may have increased their the maximum number of call attempts when the refusal rate for a survey was high.

Direct efforts to persuade and gain compliance. As expected, surveys that offered incentives had significantly higher response rates than those that did not ($b = 0.12, p < 0.05$; see row 14 of column 1 in Table 23.3), a difference of 12 percent on average. Surprisingly, though, incentives were associated with increased contact ($b = 0.11, p < 0.05$) rather than increased cooperation ($b = 0.08$, not significant) or decreased refusal ($b = 0.02$, not significant; see row 14 of columns 2–4 in Table 23.3). This could have occurred because interviewers communicated the incentive to household members other than the respondent, and this information decreased immediate hang-ups but did not increase respondent willingness to participate.

Attempting refusal conversions was not associated with increased response rates ($b = 0.03$, not significant) or cooperation rates ($b = -0.03$, not significant; see row 15 of columns 1 and 3 in Table 23.3). Surprisingly, attempting refusal conversions was associated with higher contact rates ($b = 0.10, p < 0.01$) and slightly *higher* refusal rates ($b = 0.05, p < 0.10$; see row 15 of columns 2 and 4 in Table 23.3).

Convenience and respondent burden. As expected, response rates were lower for longer interviews ($b = -0.006, p < 0.01$; see row 16 of column 1 in Table 23.3). A 1 minute increase in survey length reduced the response rate by sixth tenths of a percentage point. This suggests that a 15 minute increase in the length of an interview would result in a 9 percent decrease in response rates. Longer interview length appears to have decreased response rates primarily by decreasing cooperation, because this rate was strongly correlated with interview length ($b = -0.008, p < 0.01$; see row 16 of column 3 in Table 23.3). Interview length was unrelated to contact rate or refusal rate ($b = -0.001$ and $b = 0.0005$, respectively, not significant; see row 16 of columns 2 and 4 in Table 23.3).

Procedures designed to increase the convenience of scheduling the interview did not increase response rates (see row 17–19 of column 1 in Table 23.3). Being able to make appointments with any household member was associated with significantly higher refusal rates ($b = 0.06, p < 0.01$; see row 17 of column 4 in Table 23.3), and allowing a respondent to call and make an appointment or complete the interview were associated with increased contact rates ($b = 0.14, p < 0.01$ and $b = 0.16, p < 0.01$, respectively; see rows 18 and 19 of column 2 in Table 23.3), and increased refusal rates ($b = 0.06, p < 0.01$ and $b = 0.09, p < 0.01$, respectively; see rows 18 and 19 of column 2 in Table 23.3)

23.5.4.2 *Multivariate Analyses*

These survey administration procedures were implemented in correlated ways, so it is interesting to separate their effects on rates by conducting multivariate regressions predicting the rates using the procedural variables in Table 23.3. One of the difficulties with doing so is the amount of missing data for some of the survey administration procedures (see Tables 23.1 and 23.2). In order to maintain

a reasonable sample size to detect effects, we included only independent variables that were significant predictors in the bivariate analyses shown in Table 23.3 and for which we had data for at least 80 percent of the surveys. The latter requirement led to exclusion of the average length of the interview and the maximum number of call attempts. In the regressions shown in Table 23.4, response, cooperation, contact, and refusal rates were regressed on variables representing: news media release surveys (versus those that were not for news media release), national surveys (versus state or regional), list-assisted sampling, respondent selection techniques (using a series of dummy variables for various techniques with interviews of any knowledgeable adult as the comparison group), whether interviews were conducted in Spanish, leaving answering machine messages, the length of the field period length, and the use of incentives.

These analyses' results were primarily consistent with those of the bivariate analyses, although some of the bivariate effects changed. Taken together, these survey administration procedures explained 80 percent of the variance in response rates.

Purpose of interview. The response, contact, cooperation, and refusal rates for news media release surveys were not different than those for surveys not for news media release ($b = 0.03$, not significant; $b = 0.03$, not significant; $b = -0.05$, not significant; and $b = -0.02$, not significant, respectively; see row 1 in Table 23.4). The effect of survey purpose on response rates, which was significant in the bivariate analyses, presumably become nonsignificant in the multivariate analyses because the many methodological differences between media and nonmedia surveys accounted for the apparent effect of survey purpose.

Whom to interview. National surveys had significantly higher response ($b = 0.10$, $p < 0.05$) and cooperation rates ($b = 0.16$, $p < 0.05$) than those conducted in smaller geographic areas (see row 2 of columns 1 and 3 in Table 23.4). Using list-assisted sampling was associated with higher response ($b = 0.12$, $p < 0.01$), contact ($b = 0.17$, $p < 0.01$), cooperation ($b = 0.11$, $p < 0.01$) and refusal rates ($b = 0.14$, $p < 0.01$; see row 3 of Table 23.4).

Response rates also varied by the method used to select the respondent to interview (see rows 4–8 of Table 23.4). Consistent with the bivariate analysis, interviewing any knowledgeable adult had the highest response rates; techniques that selected an adult from those at home had somewhat lower response rates ($b = -0.35$, $p < 0.01$ and $b = -0.33$, $p < 0.01$; see rows 4 and 5 of column 1 in Table 23.4); and techniques that selected a respondent from all adult household members had the lowest response rates ($b = -0.46$, $p < 0.01$ and $b = -0.43$, $p < 0.01$; see rows 6 and 7 of column 1 in Table 23.4). The multivariate analyses showed more clearly that these differences are primarily due to differences in cooperation and refusal rates (see rows 4–8 of columns 3 and 4 in Table 23.4) than to differences in contact rates (see rows 4–8 of column 2 in Table 23.4).

Interviewing in Spanish increased response rates ($b = 0.05$, $p < 0.05$; see row 9 of column 1 in Table 23.4) but was not associated with contact, cooperation, or refusal rates ($b = 0.03$, not significant; $b = 0.05$, not significant; $b = -0.03$, not significant, respectively; see row 9 of columns 2–4 in Table 23.4).

Table 23.4. Unstandardized OLS Regression Coefficients Predicting Response, Contact, Cooperation, and Refusal Rates with Survey Administration Procedures (Standard Error in Parentheses)

Predictor	Response rate	Contact rate	Cooperation rate	Refusal rate
Purpose of interview				
For news media release	0.03 (0.05)	0.03 (0.08)	-0.05 (0.07)	-0.02 (0.06)
Whom to interview				
National survey	0.10* (0.04)	0.003 (0.05)	0.16** (0.05)	-0.04 (0.04)
List-assisted sampling	0.12** (0.04)	0.17** (0.05)	0.11* (0.05)	0.14** (0.04)
Respondent selection technique ^a				
Youngest male/oldest female at home	-0.35** (0.06)	0.01 (0.09)	0.45** (0.08)	0.19** (0.07)
Last/next birthday at home	-0.33** (0.06)	-0.01 (0.09)	0.39** (0.08)	0.19** (0.07)
Last/next birthday all adult residents	-0.46** (0.05)	-0.12 (0.08)	-0.57** (0.07)	0.18** (0.06)
Modified Kish	-0.43** (0.06)	0.004 (0.09)	-0.56** (0.09)	0.31** (0.07)
Other	-0.28** (0.05)	-0.05 (0.08)	-0.26** (0.07)	0.15* (0.06)
Spanish interviewing	0.05* (0.02)	0.03 (0.03)	0.05 (0.03)	-0.03 (0.02)
Attempts to provide additional information				
Answering machine messages left	-0.13 (0.11)	0.60** (0.16)	-0.60** (0.15)	0.42** (0.12)
General contact effort				
Field period length (in days)	0.001** (0.0002)	0.0002 (0.0003)	0.001* (0.0003)	0.00001 (0.0002)
Direct attempts to persuade and gain compliance				
Incentives offered	0.10* (0.04)	-0.07 (0.06)	0.16** (0.05)	-0.10* (0.04)
<i>R</i> ²	0.80	0.63	0.75	0.59
<i>N</i>	87	87	87	87

Note: Only variables that were significantly or marginally significantly associated with response rates in the bivariate analyses shown in Table 23.3 and that had valid data for at least 80 percent of the 114 cases were included as predictors in these analyses. The latter criterion led to the exclusion of the length of the survey interview, which was missing for 22 percent of the 114 surveys and maximum number of call attempts, which was missing for 33 percent of the 114 surveys.

^aAny adult at home was used as the comparison group.

***p* < 0.01.

**p* < 0.05.

¹*p* < 0.10.

Attempts to provide additional information. Leaving answering machine messages was not associated with response rates, as was the case in the bivariate analyses ($b = -0.13$, not significant; see row 10 of column 1 in Table 23.4). The multivariate analyses suggest, however, that answering machine messages increased contact rates ($b = 0.60$, $p < 0.01$), reduced cooperation rates ($b = -0.60$, $p < 0.01$), and increased refusal rates ($b = 0.42$, $p < 0.01$; see row 10 of columns 2–4 in Table 23.4). These opposing effects may have canceled one another out, leading to no overall effect of leaving answering machine messages on response rates.

General contact effort. Field period length was significantly and positively associated with response rates ($b = 0.001$, $p < 0.05$; see row 11 of column 1 in Table 23.4). Surprisingly, field period length was not associated with contact rate ($b = 0.002$, not significant), but was associated with a higher cooperation rate ($b = 0.001$, $p < 0.05$; see row 11 of columns 2 and 3 in Table 23.4). Field period length was unassociated with refusal rate ($b = 0.00$, not significant; see row 11 of column 4 in Table 23.4). Thus, it appears that a longer field period may have led to more willingness to cooperate by people who initially provided soft refusals.

Direct attempts to persuade and gain compliance. Offering incentives was significantly and positively related to response rates ($b = 0.10$, $p < 0.05$; see row 12 of column 1 in Table 23.4). This was due to increased cooperation rates ($b = 0.16$, $p < 0.01$) and reduced refusal rates ($b = -0.10$, $p < 0.05$; see row 12 of columns 2 and 4 in Table 23.4) but not to changes in contact rates ($b = -0.07$, not significant; see row 12 of column 3 in Table 23.4).

23.5.4.3 Analyses Using Only National Surveys

The analyses of survey administration procedures reported thus far used both national and nonnational surveys. Multivariate analyses like those in Table 23.4 conducted with only national surveys yielded results similar to those produced using the full set of surveys, but there were some differences. Some effects that were significant when using all surveys became nonsignificant using only the national surveys. For example, respondent selection technique was no longer significantly associated with refusal rates; leaving answering machine messages was no longer significantly associated with either contact or refusal rates; and using incentives was no longer significantly associated with any of the rates. And some effects became significant that had not been before. For example, national news media surveys yielded significantly higher cooperation rates and lower refusal rates than nonnews media release surveys ($b = 0.24$, $p < 0.01$; $b = -0.19$, $p < 0.01$; respectively). But in general, the results were closely comparable to those shown in the Tables.

Controlling for survey organization. We also conducted the analyses shown in Table 23.4 controlling for nonindependence among surveys conducted by the same organization (by specifying organization as the “psu” using “svy” commands in Stata). The results of these analyses were very similar to those reported in Table 23.4, with just a few exceptions. The effect of Spanish interviewing on refusal rates became significant ($b = -0.03$, $p < 0.05$); the effect of answering machine messages on

cooperation became nonsignificant ($b = -0.60$, not significant); and using incentives became significantly negatively associated with contact ($b = -0.07$, $p < 0.05$).

When we estimated these parameters controlling for survey organization and using just the national surveys, the results of analyses predicting response and contact rates did not change notably. There was little variation in the administration procedures within survey organization, so the effects of different procedures on cooperation and refusal rates could only be disentangled from survey organization by including nonnational surveys.

23.5.5 Response Rates and Demographic Representativeness

Finally, we explored the relation of response rates to the demographic representativeness of the interviewed samples using a subset of 81 national surveys for which we had unweighted demographic frequencies. Response rates in these surveys varied from 0.05 to 0.54. We examined the absolute value of the discrepancies between unweighted survey estimates and population estimates from the Census Bureau's March Supplement of the CPS from the year in which the survey was conducted for gender, income, race, education, and age (see rows 6–10 of Table 23.1).

The average discrepancies for these variables ranged from 2.20 percent for age to 5.68 percent for education. In order to gauge the association of demographic discrepancy with response rate, we regressed each of the demographic discrepancies on (1) response rate only, and (2) response rate and response rate squared to test for nonlinearity.

For gender, income, and race, the association was significantly negative and linear (see rows 1–3 of Table 23.5); response rate accounted for less than 10 percent of the

Table 23.5. Effect of Response Rates on Demographic Representativeness

Demographic discrepancy	<i>N</i>	Unstandardized regression coefficients (standard errors in parentheses)		
		Linear effect of response rate	Squared effect of response rate	<i>R</i> ²
Gender ^a	57	−9.59** (3.59)	—	0.10
Income	74	−4.61* (2.22)	—	0.06
Race	80	−8.55* (3.55)	—	0.07
Education	81	−29.63** (10.54)	37.79* (16.43)	0.13
Age	81	−20.67** (5.51)	23.97** (8.59)	0.26

^a Twenty-four surveys (from four organizations) that used gender quotas were excluded from this estimate.

** $p < 0.001$.

* $p < 0.05$.

variance in demographic discrepancy in each case. The demographic discrepancies for gender, income, and race predicted by response rates in the regression equations in rows 1–3 of Table 23.5 are shown in Fig. 23.1(a)–(c), respectively. For example, a 45 percentage point increase in response rate was associated with a decrease in demographic discrepancy of 3 percent for age and 4 percent for education and race.

For education and age, the effect of response rates on demographic discrepancies was nonlinear. In both cases, the linear effect of response rates was negative and significant, and the squared effect of response rates was positive and significant, indicating decreased marginal returns (see rows 4 and 5 of columns 2 and 3 in Table 23.5). These effects are illustrated by the demographic discrepancies predicted from response rates using the regressions in rows 4 and 5 of Table 23.5 shown in Fig. 23.1(d)–(e). Education and age demographic discrepancies were greater as response rate dropped below 0.30, but increases in response

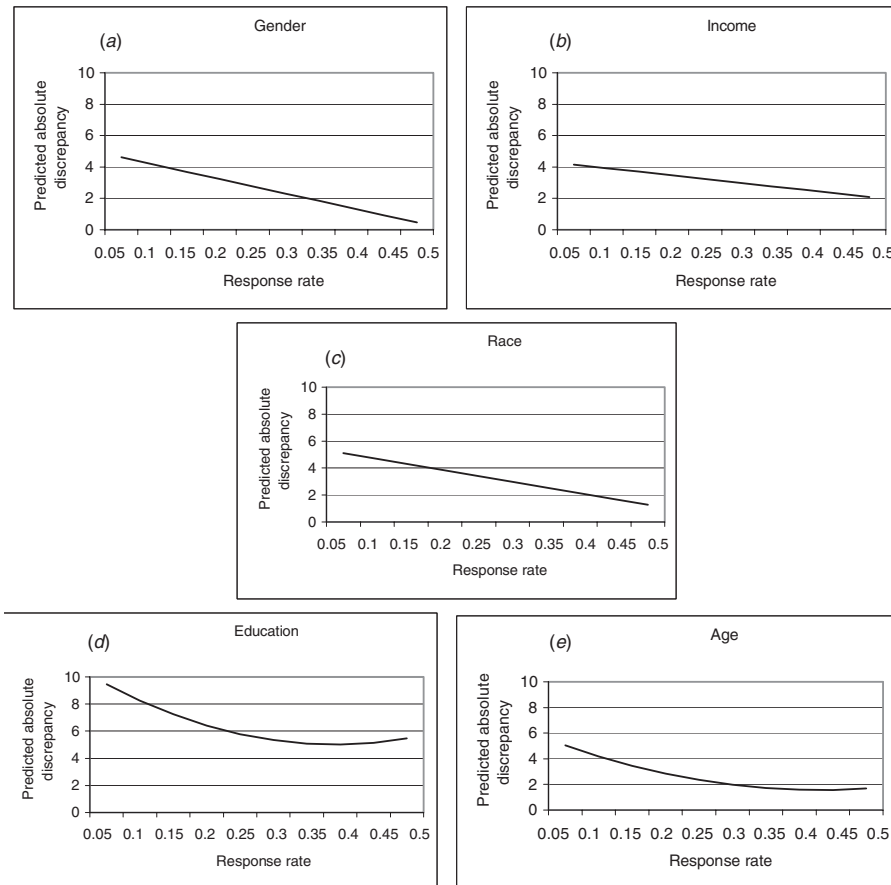


Figure 23.1. Difference in response rate between groups as response rate increases: (a) gender, (b) income, (c) race, (d) education, and (e) age.

rates above 0.30 were not associated with further reductions in education and age discrepancies.

When controlling for survey organization, the associations between response rates and demographic discrepancies involving gender, income, and race became nonsignificant. The nonlinear relations of response rate with education and age discrepancies were unchanged by controlling for survey organization.

23.6 DISCUSSION

23.6.1 Summary of Findings and Implications

This research examined response rates in the largest set of surveys to date. The response rates in the surveys we examined were somewhat lower than those reported in other large reviews of RDD response rates (e.g., Massey et al., 1997 found an average response rate of 62 percent among 39 RDD surveys), but our surveys were conducted later and included more surveys that were designed for news media release than previous reviews of response rates in the field.

Consistent with a growing body of evidence, we found that response rates have decreased in recent years (see also Battaglia et al., 2007, Chapter 24 in this volume) and that when organizations have changed their survey administration procedures in recent years, they have done so in ways designed to increase response rates. These findings suggest that trends observed regarding previous time periods (de Heer, 1999; Steeh et al., 2001; Tortora, 2004; Curtin et al., 2005) have continued in recent years.

We also explored the antecedents and consequences of response rates, and much of our evidence dovetails nicely with findings reported by other investigators. Like others, we found that surveys with longer field periods (Groves and Lyberg, 1988; Keeter et al., 2000), shorter interviews (Collins et al., 1988; Singer and Presser, 2007, Chapter 21 in this volume), more call attempts (O'Neil, 1979; Traugott, 1987; Massey et al., 1981; Merkle et al., 1993), incentive offers (Yu and Cooper, 1983, Chapter 22 in this volume; Singer et al., 1999; Singer et al., 2000; Cantor et al., 2007), and less invasive, easier to implement respondent selection techniques (O'Rourke and Blair, 1983; Tarnai et al., 1987) yielded higher response rates. As expected, surveys that used list-assisted samples and Spanish interviewing had higher response rates as well.

Although leaving messages on answering machines was weakly associated with response rates in a bivariate analysis (as found by Xu et al., 1993), this effect disappeared in our multivariate analysis, suggesting that the bivariate association was due to other methodological differences across studies.

Sending advance letters was also not associated with increased response rates. Although advance letters may enhance the perceived legitimacy of survey interviewers, obtaining this benefit requires that the advance letter be read by the same person who answers the telephone when the interviewer calls and that the letter be associated by the potential respondent with the telephone call. And

these conditions may only rarely occur. Furthermore, advance letters may also forewarn potential respondents who want to avoid being interviewed, allowing them to think of excuses not to participate or to screen their calls to avoid interviewers. Obtaining addresses and mailing letters uses valuable resources, so implementing this procedure may not have enhanced response rates because the funds used to pay for it could have been more effectively used to increase response rates in other ways.

Implementing refusal conversion attempts did not yield higher response rates. Although refusal conversions in a single study may increase its response rate (Curtin et al., 2000; Brick et al., 2003; Retzer et al., 2004), there are at least two reasons why refusal conversions may not be associated with response rates across studies. First, the time and financial resources devoted to refusal conversion attempts would have been devoted instead to other, equally successful strategies if the refusal conversions had not been attempted (i.e., simply more calling to other, nonrefusal households). Second, the decision to attempt refusal conversions may have been made partway through the field period of a study, and researchers may have been particularly likely to attempt refusal conversions when the response rate was low.

Making appointments and allowing respondent-initiated contact (for appointments and interviews) were not associated with increased response rates. Perhaps the people who took advantage of these opportunities would have been easy to contact and elicit cooperation from regardless.

Response rates were positively associated with demographic representativeness, but only very weakly. This conclusion is consistent with much past evidence showing that efforts to increase response rates may have minimal effects on demographic data quality (e.g., Keeter et al., 2000; Brick et al., 2003; Frankovic, 2003). In general population RDD telephone surveys, lower response rates do not notably reduce the quality of survey demographic estimates. So devoting substantial effort and material resources to increasing response rates may have no measurable effect on the demographic accuracy of a survey sample.

Q3

23.6.2 Limitations and Future Research

This research has a number of limitations. First, we have examined correlations of response rates and other rates with administration procedures. Because the procedures that we examined were not manipulated experimentally and because many of them were correlated with one another in implementation, we cannot be certain that we have effectively disentangled their impact on response rates.

Second, our findings regarding the weak associations between response rates and demographic representativeness apply only to the specific range of response rates we examined and should not be generalized beyond that range. Furthermore, although the response rates we examined varied from 4 percent to 70 percent, 77 percent of the surveys in our sample had response rates between 20 percent and 50 percent, and our findings seem most likely to apply to this range of surveys. Our findings might

not generalize to improvements in response rates above 50 percent or to declines in response rates below 20 percent. Our findings should be generalized to studies other than general population RDD surveys with caution as well.

23.7 CONCLUSION

Response rates in RDD surveys continue to decrease over time, and lower response rates do decrease demographic representativeness within the range we examined, though not much. This evidence challenges the assumptions that response rates are a key indicator of survey data quality and that efforts to increase response rates will necessarily be worth the expense.

Author Query

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Q3:- Please specify which ref. should be cited here Brick et al. (2003a) or (2003b)

Q4:- Please include ref. Xu et al. (1997) in ref. list.

Q5:- Please specify which ref. should be cited Smith (2003a) or (2003b).

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