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

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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., Curtin, Presser, and Singer 2005; de Heer 1999; Steeh et al. 2001; Tortora 2004). 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 (Curtin, Presser, and Singer 2000, 2005; de Heer 1999).

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 (Aday 1996; Babbie 1990; Backstrom and Hursh 1963; Rea and Parker 1997), and response rates are widely 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 provide data in the survey 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. That is, 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 non-response 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, Schipani, and Cho 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.

The Current Investigation

The research we describe here was designed to contribute to our understanding of response rates in several ways. First, we surveyed experts in the field to explore whether the survey administration procedures being used (e.g., number of call attempts, use of refusal conversions, and 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 RDD telephone studies conducted over a 10-year period (between 1996 and 2005) by leading survey organizations to assess 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 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 in a multivariate, correlational, observational (non-experimental) statistical analysis.

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.

Definitions

The response rate for an RDD survey is the proportion of eligible households with

whom interviews are completed.¹ 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.² The cooperation rate is the proportion of successfully contacted households from which an interview is obtained.³

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

¹ AAPOR has defined 6 different response rates. We used response rate 3, which includes in the denominator all cases known to be eligible and a portion of unknown eligibility cases. The portion of unknown eligibility households that are included in the denominator is referred to as “e.” The value of “e” can be specified in a number of ways (see Smith 2003 for a review). In our research, e was calculated using the proportional method or the CASRO method, which assumes that “the ratio of eligible to not eligible cases among the known cases applies to the unknown” (Smith 2003; p. 2). This method provides a conservative estimate of e (Keeter et al. 2000) and was desirable for us because it could be estimated uniformly across studies with different designs.

² AAPOR has defined three contact rate formulas (AAPOR 2004). We used contact rate 2, for which the denominator is the number of households known to be eligible plus a portion of those of unknown eligibility. The proportion of unknown eligibility households that were included was determined with “e” as with response rate 3.

³ AAPOR has defined four cooperation rate formulas (AAPOR 2004). We used cooperation rate 1, which is estimated as the number of completed interviews, divided by households that were successfully contacted.

households that refuse to participate.⁴ Although one might imagine that the refusal rate is 100% 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.

Antecedents and Consequences of Response Rates

Survey Administration Procedures and Response Rates

As a survey is constructed and conducted, researchers must make many decisions about how to conduct the survey. Some of these decisions are driven by the purpose of the survey (e.g., whether it is for news media release or not). Other decisions involve who 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 sample telephone numbers, the method for choosing a household member to interview), whether or not to attempt to provide information about the study to respondents beyond attempted contact by telephone (e.g., by using advance letters or leaving answering machine messages), the amount of effort that will be made to contact respondents (e.g., the field period length and number of contact attempts), the use of direct efforts to persuade respondents to comply with interviewers' request and participate in the survey (e.g., by offering incentives or attempting to convert refusals), and procedures that minimize respondent burden by making it easier or more convenient for respondents to participate (e.g., the length of the survey, procedures involving appointments and respondent-initiated contact, and

⁴ AAPOR defines three refusal rates (AAPOR 2004). We used refusal rate 2, in which the denominator includes all known eligible households and a portion of households of unknown eligibility. The proportion of unknown eligibility households that were included was determined with "e" as with response rate 3.

interviewing in languages other than English). These decisions are influenced both by the purpose of the survey and the resources available to researchers to conduct the survey.

Many researchers have examined how survey administration procedures affect telephone survey response rates. This research has been used, in part, to identify procedures to maximize response rates and to assess the effectiveness of efforts to increase response rates (e.g., Frankovic 2003; 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.

Who to Interview

List-assisted samples. RDD surveys do not always use completely random samples of all possible telephone numbers. Instead, researchers sometimes use “list-assisted samples.” Published telephone number directories can be used to identify banks of 100 sequential numbers (e.g., 717-263-4800 through 717-263-4899) that contain one or more listed residential numbers (called “1+ banks”; Casady and Lepkowski 1993; Tucker, Lepkowski and Pierkarski 2002), two or more listed residential numbers (“2+ banks”), or three or more listed residential numbers (“3+ banks”).

Banks of numbers containing more listed residential numbers are likely to have higher proportions of working residential numbers and lower proportions of nonresidential or nonworking numbers. So, for example, a firm is likely to need fewer telephone numbers from a sample of numbers from 1+ banks in order to complete a target number of interviews than the firm would need if using a simple random sample of all possible telephone numbers. The greater the restrictions placed on the sample (e.g., using

only 2+ banks is more restrictive than using only 1+ banks, using only 3+ banks is more restrictive than using 2+ banks, and so on), the more residential numbers a sample is likely to contain, and the less time interviewers are likely to spend calling nonresidential and nonworking numbers. Thus, using banks containing multiple listed residential numbers may yield higher response rates than using all banks or banks with only a minimum of one listed residential number.

However, using list-assisted samples may also 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, Julp, and Starer 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 Gaziano 2005 and Rizzo, Brick, and Park 2004 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., Binson et al. 2000; Oldendick et al. 1988).

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 numbers⁵, (2) only a portion of 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 phone. 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,

⁵ The proportion of listed RDD sample telephone numbers varies greatly in published reports, from less than 40% to more than 70% (e.g., Brick, Warren, and Wivagg 2003; Traugott, Groves, and Lepkowski 1987). The proportion of listed numbers 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.

Groves, and Lepkowski 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 (Camburn et al. 1995; Dillman et al. 1976; Hembroff et al. 2005; Link and Mokdad 2005a; Smith et al. 1995; Traugott et al. 1987).

Messages on answering machines. Now that answering machines and voicemail are ubiquitous (see Roth, Montaquila, and Brick 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, Montaquila, and Brick 2001) and participation (Xu, Bates, and Schweitzer 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 (Link and Mokdad 2005b; Tuckel and Schulman 2000). 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 (Tucker and Schuman 2000; Xu, Bates, and Schweitzer 1997).

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).

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., Massey et al. 1981; Merkle, Bauman, and Lavrakas 1993; O'Neil 1979; Traugott 1987). This effect is not linear; each additional call attempt increases response rates less than the previous attempt does.⁶

Direct Efforts to Persuade and Gain Compliance

Incentives. Many studies have shown that offering respondents material incentives for participation increases response rates (e.g., Singer et al. 1999; Singer, van Hoewyk, and Maher 2000; Yu and Cooper 1983). Typically, cash incentives have been more effective than other material gifts, and prepaid incentives (provided before respondents

⁶ The timing of calls (across time of day and days of the week) may also influence their success (e.g., Cunningham, Martin, and Brick 2003).

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, Cialdini, and Couper 1992).

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, Brick, Hagedorn, Kennedy, and Keeter this volume) and that 7-14% of refusals are successfully converted to completed interviews when refusal conversions are attempted (e.g., Brick et al. 2003; Retzer, Schipani, and Cho 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).

Spanish interviewing. The Latino population is one of the fastest growing ethnic groups in the U.S. (U.S. Census Bureau), making it increasingly important 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 eligible respondents that cannot be interviewed due to language barriers and reduce the burden of responding for respondents who may be bilingual but have difficulty with English. Potential respondents, particularly those who speak a little English but who would not feel comfortable completing the interview in English, may also avoid participating in the interview in other ways – by screening their calls to avoid the interviewer or by refusing to participate. Interviewing in Spanish may also increase response rates by reducing these reactions from these potential respondents.

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, Barker, and Hsiung 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 vs. late responders to survey requests (under the assumption that late responders are more similar to nonresponders than early responders; e.g., Merkle, Bauman, and Lavrakas 1993), (4) comparing people who refuse an initial survey request to those who never refuse (e.g., O'Neil 1979; Retzer, Schipani, and Cho 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., Keeter et al. 2000; Mulry-Liggan 1983).

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, non-response in panel studies after the first wave is not the same phenomenon as non-response in the initial wave of such a survey. Similarly, reluctant respondents and late responders may not be the same as non-respondents.

Some of the most direct evidence about nonresponse bias comes from research comparing responses from similar surveys that achieved different response rates (e.g., Groves, Presser, and Dipko 2004; Keeter, Miller, Kohut, Groves, and Presser 2000;

Traugott, Groves, and Lepkowski 1987). 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 over-represented 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 (Merkle, Bauman, and Lavrakas 1993; Shaiko et al. 1991; Traugott 1987) 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 and that in the population. And Retzer, Schipani, and Cho (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, Schipani, and Cho 2004). And in a comparison of surveys with different response rates, the survey with the higher response rate under-represented 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 under-represent racial minorities, particularly African-American respondents (Chang and Krosnick 2001), although there is some evidence that other racial minority groups may be over-represented (Chang and Krosnick 2001; Mulry-Liggan 1983). White respondents have been under-represented in some surveys (e.g., Chang and Krosnick 2001; Keeter et al. 2000), over-represented in others (e.g., Green, Krosnick, and Holbrook 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 under-representation 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, Bauman, and Lavrakas 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, Schipani, and Cho 2004).

Education was also found to be related to likelihood of responding in some telephone surveys. Some studies documented under-representation of low education respondents and over-representation of high education respondents (e.g., Chang and Krosnick 2001; Mulry-Liggan 1983). 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, Schipani, and Cho 2004). However, other studies have found that more educated people require more call attempts (Merkle, Bauman, and Lavrakas 1993) and that surveys with higher response rates may over-represent high education respondents more than surveys with lower response rates (Keeter et al. 2000).

Compared to the population, RDD studies have sometimes under-represented the youngest (Chang and Krosnick 2001) and oldest adults (Chang and Krosnick 2001; Mulry-Liggan 1983). Older adults (those 65 and older) are easier to contact (Merkle, Bauman, and Lavrakas 1993; Shaiko et al. 1991; Traugott 1987), 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 larger proportion of respondents who require a refusal conversion than respondents who do not (Massey, et al. 1981; O'Neil 1979; Retzer, Schipani, and Cho 2004; Struebbe et al. 1986).

Thus, some past work suggests that the demographic characteristics of respondents and nonrespondents may differ and that response rates may be related to demographic accuracy. Specifically, respondents from more vulnerable social groups (e.g., those with low education or income, or racial minorities, especially African-Americans, and the elderly) may be under-represented in RDD surveys, and this under-representation may grow with decreasing response rates. But the evidence on this issue is clearly mixed with plenty of studies contradicting this latter claim.

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., Curtin, Presser, and Singer 2000, 2005; Groves, Presser, and Dipko 2004; Keeter et al. 2000; Merkle, Bauman, and Lavrakas 1993; O'Neil 1979; Smith 1984). 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 (Curtin, Presser, and Singer 2000, 2005; Groves, Presser, and Dipko 2004; Merkle, Bauman, and Lavrakas 1993; O'Neil 1979; Smith

1984).

Conclusion. Thus, the evidence accumulated provides little support for the idea that response rates in telephone surveys will be associated with the distributions of substantive survey responses and mixed evidence as to whether low response rates are associated with reduced demographic representativeness. One of the goals of the current investigation was to contribute to this evidence by testing the relation between response rates and demographic representativeness in a large set of RDD telephone surveys. We also tested the influence of researchers' decisions about survey administration procedures on response rates by comparing the response rates of surveys conducted using different procedures.

Methods

To further explore the causes and effects of nonresponse, we contacted fourteen 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 (KFF), The Los Angeles Times, Mathematica Policy Research, Inc., the Pew Research Center for the People and the Press, the RAND Corporation, Research Triangle Institute (RTI), Schulman, Ronca, Bucuvalas, Inc. (SRBI), 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 co-sponsored a survey, or one organization designed and directed the research and subcontracted data collection to another organization.

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. We identified 12 such people, to whom we sent them a questionnaire asking about differences in survey administration procedures between 2000 and 2004.⁷ 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.

RDD Study Methodologies and Response Rates

From each organization, we requested information about recent general population RDD surveys they had conducted.⁸ We requested three types of information

⁷ Because some surveys involved the collaboration of several organizations and because the data collection for multiple organizations was done by the same subcontractor, there is not a one-to-one association between these 12 individuals and the 14 organizations initially contacted.

⁸ These surveys were collected through three processes. In January of 2003, we contacted 12 organizations requesting disposition code frequencies, unweighted demographic frequencies, and information about survey administration procedures for up to 5 national and 5 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 (1/1/02, 4/1/02, 7/1/02, 10/1/02, and 1/1/03). These contacts resulted in disposition code frequencies and survey administration information for 49 surveys and unweighted demographic distributions for 27 of these surveys. (1/1/04, 4/1/04, 7/1/04, 10/1/04, and 1/1/05). In February of 2005, we contacted 6 organizations (5 of the organizations contacted in January of 2003 and one new organization) and requested disposition code frequencies, information about survey administration procedures, and

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. 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 5 involved some other sort of geographic area (e.g., city, county, or metropolitan area).⁹ Of the 90 national surveys, unweighted demographic frequencies were provided for 81 of them.¹⁰ Among these 90 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.

unweighted demographic frequencies for recent general population, RDD telephone surveys that were in the field for at least 3 days. We specified that we were particularly interested in national surveys, but could include state or regional surveys as long as they were general population RDD surveys. This resulted in the collection of 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 in [ASK LINCHIAT] and asked [ASK LINCHIAT]. DESCRIBE PROCESS This collection effort resulted in disposition code frequencies and survey administration information about an additional 43 surveys and unweighted demographic frequencies for 36 of these surveys.

⁹ We included surveys of a state or region in these analyses to maximize our sample size and because doing so reduced the extent to which survey administration procedures were confounded with one another. In the smaller set of 90 national surveys, some of the survey administration procedures were perfectly correlated (e.g., allowing respondents to call to make an appointment and allowing respondents to call to complete the interview), making it impossible to separate their effects. It seems unlikely that the associations between survey administration procedures and response rates differ by geographic region. Our analyses controlled for mean differences in response rates between national and non-national surveys.

¹⁰ 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.

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 v. all blocks with at least 2 listed residential numbers), the respondent selection technique used, 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, procedures for making appointments and allowing respondents to contact the survey organization, and the languages in which the interviewing was conducted (see Tables 1 and 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.

Calculating Response, Cooperation, Contact, and Refusal Rates

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).¹¹

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 discrepancies between the survey data proportion and the CPS proportion for all the response categories

¹¹ The final disposition codes were used to estimate response rates (AAPOR 2004). 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.

of that variable.¹²

Results

Changes in Survey Administration Procedures 2000-2004

Who 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.

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.

¹² Coding 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.

General Contact Effort

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

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.

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.

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.

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.

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.

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 1. Response rates varied from 4% to 70% and averaged 30%. Contact rates ranged from 33% to 92% and averaged 67%.

Cooperation rates ranged from 9% to 84% and averaged 44%. Refusal rates ranged from 4% to 55% and averaged 29%. The estimate of e varied from .26 to .84 and averaged .55.¹³

Contact and cooperation rates were related to response rates as one would expect. Cooperation rates were highly significantly and positively correlated with response rates ($r=.89$, $p<.001$, $N=114$). Contact rates were also highly significantly and positively correlated with response rates, but more weakly ($r=.62$, $p<.001$, $N=114$). 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 ($r=-.45$, $p<.01$, $N=114$) and response rates ($r=-.20$, $p<.05$, $N=114$), and positively associated with contact rates ($r=.52$, $p<.001$, $N=114$). This is consistent with existing evidence that increased contact provides greater opportunities for respondent to refusals (Sangster and Meekins 2004; Brick et al. 2003).

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 ($r=-.38$, $p<.001$, $N=113$), 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

¹³ 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 represents a conservative estimate of e (i.e., this procedure likely overestimates e and underestimates response rates). However, the estimates of e we report are similar to those reported in previous work (e.g., Smith 2003). The estimates of e for the surveys we examined are likely to be relatively high, because the bulk of the surveys were for media release and involved fairly short field periods, which leads to high estimates of e (Smith 2003).

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 that were identical in terms of length and topic with very consistent survey administration procedures.¹⁴ 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 ($r = -.70$, $p < .001$, $N = 26$). 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 percentage points, a dramatic decrease.

We also explored how contact rates, cooperation rates, and refusal rates changed over time. Contact rates ($r = -.61$, $p < .001$, $N = 26$) and cooperation rates ($r = -.47$, $p < .001$, $N = 26$) dropped significantly during this time period. Interestingly, refusal rates were not significantly associated with date of survey ($r = -.07$, ns, $N = 26$), consistent with evidence that refusal rates may not have been changing over time while cooperation and contact rates were (e.g., Brick et al. 2003).

¹⁴ The length of the field period varied from 3 to 14 days. Field period length was not related to response, contact, cooperation, or refusal rates. None of these results regarding over-time changes were affected by controlling for length of field period.

Survey Administration and Response Rates

Bivariate Analyses

Purpose of the survey. Surveys that were intended for news media release had response rates that were 6 percentage points lower on average than those that were not intended for news media release ($b = -.06$, $p < .05$; see row 1 of column 1 in Table 3). This difference was a function of lower contact rates ($b = -.12$, $p < .05$) and higher refusal rates ($b = -.04$, $p < .10$), but not cooperation rates ($b = -.03$, ns; see row 1 of columns 2, 3, and 4 in Table 3 respectively).

Who to interview. The response rates for national surveys were significantly higher than those for state or regional surveys ($b = .09$, $p < .01$; see row 2 of column 1 in Table 3). This effect was primarily due to greater cooperation in national surveys ($b = .11$, $p < .01$), and not to differences in contact ($b = .03$, ns) or refusal rates ($b = -.002$, ns); see row 2 of columns 2, 3, and 4 in Table 3).

Using list-assisted samples (instead of pure RDD samples) was strongly associated with higher response rates ($b = .14$, $p < .01$), contact rates ($b = .10$, $p < .01$), and cooperation rates ($b = .19$, $p < .01$), and weakly associated with higher refusal rates ($b = .05$, $p < .10$; see row 5 of columns 1-4 in Table 3).¹⁵

Response rates were also related to the respondent selection technique used.

Interviewing any knowledgeable adult (the baseline group in the regression analysis

¹⁵ List-assisted sampling was coded 0 if no list assisted sampling was done, .33 for surveys using only 1+ listed blocks, .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).

shown) had the highest response rates. Respondent selection techniques that involved selecting 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 ($b=-.20$, $p<.01$; $b=-.25$, $p<.01$; see rows 4 and 5 of column 1 in Table 3), and techniques that involved selecting a respondent from all adult residents in the household (either using the next/last birthday method or a modified Kish method) had the lowest response rates ($b=-.34$, $p<.01$; $b=-.35$, $p<.01$; see rows 6 and 7 of column 1 in Table 3). Surveys that used other respondent selection techniques had response rates somewhere between these latter two types ($b=-.28$, $p<.01$; see row 8 of column 1 in Table 3). The effects of respondent selection technique on response rates were primarily due to lower cooperation rates (see rows 4-8 of column 3 in Table 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 3).

Attempts to provide additional information. Surprisingly, sending advance letters did not enhance overall response rates ($b=.04$, ns; see row 9 of column 1 in Table 3). Advance letters did increase contact rates ($b=.10$, $p<.05$) and refusal rates ($b=.05$, $p<.10$), but not cooperation rates ($b=-.05$, ns; see row 9 of columns 2, 3, and 4 in Table 3). Thus, people for whom an address is available who read the letter may be easier to contact, perhaps because they are less likely to avoid talking with an interviewer (e.g., by screening calls using an answering machine or caller id). However, among potential respondents who are successfully contacted, advance letters may provide the opportunity to prepare reasons to refuse to participate.

Leaving messages more frequently was marginally significantly associated with higher response rates ($b=.11$, $p<.10$; see row 10 of column 1 of Table 3).¹⁶ Leaving messages on answering machines appears to have increased response rates primarily by increasing contact ($b=.17$, $p<.01$; see row 10 of column 2), and was unassociated with either cooperation ($b=.04$, ns) or refusal rates ($b=.07$, ns; see row 10 of columns 3 and 4 in Table 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 ($b=.001$, $p<.01$; see row 11 of column 1 in Table 3), such that one extra day of field period resulted in one tenth percentage point increase in response rates. Longer field periods appear to have increased response rates primarily by allowing more contact; contact rate was also strongly positively correlated with field period length ($b=.001$, $p<.01$; see row 11 of column 2 in Table 3). Field period length was more weakly related to cooperation rate ($b=.0004$, $p<.05$; see row 11 of column 3 in Table 3) and was unrelated to refusal rate ($b=.001$, ns; see row 11 of column 4 in Table 3).¹⁷

A higher maximum number of call attempts was marginally significantly positively associated with response rates ($b=.005$, $p<.10$; see row 12 of column 1 in Table

¹⁶ Answering machine messages were coded 0 if no answering machine messages were left, .5 if they were left some of the time, and 1 if they were always left for all regression analyses. 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.

¹⁷ The refusal rate was calculated using calls that were coded as refusals by interviewers and did not include callback and answering machine disposition codes possibility indicating soft refusals, which occur more frequently in surveys with longer field periods (Sangster and Meekins 2004).

3), such that increasing the maximum number of call attempts by 2 call attempt resulted in an increase in response rates of one half of one percentage point.¹⁸ More call attempts were also associated with higher contact rates ($b=.02$, $p<.01$; see row 12 of column 2 in Table 3) and refusal rates ($b=.008$, $p<.01$; see row 12 of column 4 in Table 3), but not greater cooperation ($b=.001$, ns; see row 12 of column 3 in Table 3). More call attempts may be associated with higher levels of refusals both because greater contact provides more opportunity for respondents to refuse and because survey researchers may increase their efforts by increasing the number of call attempts if the refusal rate for a survey is high.

Direct efforts to persuade and gain compliance. As expected, surveys that offered incentives had significantly higher response rates than those that did not ($b=.12$, $p<.05$; see row 13 of column 1 in Table 3), a difference of 12 percentage points on average. Surprisingly, though, incentives were associated with increased contact ($b=.11$, $p<.05$) rather than increased cooperation ($b=.08$, ns) or decreased refusal ($b=.02$, ns; see row 13 of columns 2, 3, and 4 in Table 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 ($b=.03$, ns) or cooperation rates ($b=-.03$, ns; see row 14 of columns 1 and 3 in Table 3).

¹⁸ In 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.

Somewhat surprisingly, attempting refusal conversion attempts was associated with higher contact rates ($b=.10$, $p<.01$) and slightly higher refusal rates ($b=.05$, $p<.10$; see row 14 of columns 2 and 4 in Table 3). This could have occurred if refusal conversion attempts were primarily successful at recategorizing refusals as ineligible cases, thus removing them from the denominator when estimating contact rates and refusal.

Convenience and respondent burden. As expected, response rates were lower for longer interviews ($b=-.006$, $p<.01$; see row 15 of column 1 in Table 3), such that a one minute increase in survey length resulted in a reduction in the response rate of sixth tenths of a percentage points. This suggests, for example, that a 15 minute increase in the length of an interview would result in a 9 percentage point 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 ($b=-.008$, $p<.01$; see row 15 of column 3 in Table 3). Interview length was unrelated to contact or refusal rates ($b=-.001$ and $b=.0005$, respectively, ns; see row 15 of columns 2 and 4 in Table 3).

Procedures designed to increase the convenience of scheduling the interview did not increase response rates (see row 16, 17, and 18 of column 1 in Table 3). Being able to make appointments with any household member was associated with significantly higher refusal rates ($b=.06$, $p<.01$; see row 16 of column 4 in Table 3), and allowing a respondent to call and make an appointment or complete the interview were associated with increased contact rates ($b=.14$, $p<.01$ and $b=.16$, $p<.01$, respectively; see rows 17 and 18 of column 2 in Table 3) and increased refusal rates ($b=.06$, $p<.01$ and $b=.09$,

$p < .01$, respectively; see rows 17 and 18 of column 2 in Table 3)

Surveys that involved interviewing in Spanish had marginally significantly higher response rates than those that did not ($b = .05$, $p < .10$; see row 19 of column 1 in Table 3), such that interview in Spanish increased response rates one half a percentage point on average. Interviewing in Spanish was not associated with contact rates ($b = .03$, ns) or cooperation rates ($b = .03$, ns; see row 19 of columns 2 and 3 in Table 3). Refusal rates, however, were lower for surveys in which interviews were conducted in Spanish ($b = -.05$, $p < .05$; see row 19 of column 4 in Table 3), suggesting that the ability of an interviewer to speak Spanish may important for avoiding refusals.

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 3. One of the difficulties with doing so is the amount of missing data for some of the survey administration procedures (see Tables 1 and 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 3 and for which we had data for at least 80% 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 4, response, cooperation, contact and refusal rates were regressed on variables for 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), leaving answering machine messages, the length of the field period length, the use of incentives, and whether interviews were conducted in Spanish.

The results of these analyses were primarily complementary to those from bivariate analyses, although some of the effects were affected by controlling for other procedural variables. Taken together, these survey administration procedures explained 80% 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 ($b=.03$, ns; $b=.03$, ns; $b=-.05$, ns; and $b=-.02$, ns, respectively; see row 1 in Table 4). The effect of survey purpose on response rates, which was significant in the bivariate analyses, may have been nonsignificant in the multivariate analyses because many of the methodological differences between media and non-media surveys may have been accounted for by the other predictors in the multivariate regression.

Who to interview. National surveys had significantly higher response ($b=.10$, $p<.05$) and cooperation rates ($b=.16$, $p<.05$) than those conducted in smaller geographic areas (see row 3 of columns 1 and 3 in Table 4). Using list-assisted sampling was associated with higher response ($b=.12$, $p<.01$), contact ($b=.17$, $p<.01$), cooperation ($b=.11$, $p<.01$) and refusal rates ($b=.14$, $p<.01$; see row 3 of Table 4). Response rates also varied by the method for selecting the respondent within households (see rows 6-10 of Table 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 ($b=-.35$, $p<.01$ and $b=-.33$, $p<.01$; see rows 4 and 5 of column 1 in Table 4) and techniques that selected a respondent from all adult household members had the lowest response rates ($b=-.46$, $p<.01$ and $b=-.43$, $p<.01$; see rows 6 and 7 of column 1 in Table 4). The multivariate analyses show more clearly, however, that these differences are primarily due to differences in cooperation and refusal rates (see rows 4-8 of columns 3 and 4 in Table 4) than to differences in contact (see rows 4-8 of column 2 in Table 4).

Attempts to provide additional information. Leaving answering machine messages was not associated with response rates, as was the case in the bivariate analyses ($b=-.13$, ns; see row 9 of column 1 in Table 4). The multivariate analyses suggest, however, that answering machine messages increased contact ($b=.60$, $p<.01$), reduced cooperation ($b=-.60$, $p<.01$) and increased refusal rates ($b=.42$, $p<.01$; see row 9 of columns 2-4 in Table 4). These opposing effects may have cancelled 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 ($b=.001$, $p<.05$; see row 10 of column 1 in Table 4). Somewhat surprisingly, field period length was associated in these analyses with cooperation ($b=.001$, $p<.05$), but not contact ($b=.002$, ns; see row 10 of columns 2 and 3 in Table 4). Field period length was unassociated with refusal rate ($b=.00001$, ns; see row 10 of column 4 in Table 4).

Direct attempts to persuade and gain compliance. Offering incentives was significantly and positively related to response rates ($b=.10$, $p<.05$; see row 11 of column

1 in Table 4). This was due to increased cooperation rates ($b=.16$, $p<.01$) and reduced refusal rates ($b=-.10$, $p<.05$; see row 11 of columns 2 and 4 in Table 4), but not to changes in contact ($b=-.07$, ns; see row 11 of column 3 in Table 4).

Convenience and respondent burden. Interviewing in Spanish was also a significant positive predictor of response rates ($b=.05$, $p<.05$; see row 12 of column 1 in Table 4), but was not associated with contact, cooperation, or refusal rates ($b=.03$, ns; $b=.05$, ns; $b=-.03$, ns, respectively; see row 12 of columns 2-4 in Table 4).

Response Rates and Demographic Representativeness

Next, 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 81 surveys varied from .05 to .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 Current Population Survey (CPS) from the year in which the survey was conducted for gender, income, race, education, and age (see rows 6-10 of Table 1).

The average discrepancies for these variables range from 2.20 for age to 5.68 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 5), but response rate accounted for less than 10% of the variance in demographic discrepancy in each case. The regression coefficients shown in the first

three rows of column 2 in Table 5 represent the estimated extent to which each demographic discrepancy would decrease from a response rate of near zero to a 100% response rate. The demographic discrepancies for gender, income, and race predicted by response rates in the regression equations in rows 1-3 of Table 5 are shown in Figures 1a, 1b, and 1c, respectively. These graphs show that the effect of response rates on the gender, income, and race representativeness of survey samples is small. For example, a ten percent increase in response rates resulted in decrease in demographic discrepancy of 1.6 percentage points for age, 2.2 percentage points for education, and only .5 percentage points for 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 (see rows 4 and 5 of columns 2 and 3 in Table 5). These effects are illustrated by the demographic discrepancies predicted from response rates using the regressions in rows 4 and 5 of Table 5 shown in Figures 1d and 1e. Education and age demographic discrepancies were reduced by response rates when response rates were relatively low (less than .30), but increase response rates above .30 did not further reduce education and age discrepancies. Even for surveys with low response rates, however, the influence of response rates on education and age demographic discrepancies was small, however.

Discussion

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, O'Connor, and Krotki 1997 found an average response rate of 62% 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, Khare, Frankel, Mujrray, Buckley, and Peritz, 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 (Curtin, Presser, and Singer 2005; de Heer 1999; Steeh et al. 2001; Tortora 2004) 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 this volume), more call attempts (Massey et al. 1981; Merkle, Bauman, and Lavrakas 1993; O'Neil 1979; Traugott 1987), incentive offers (Cantor, O'Hare, and O'Connor this volume; Singer et al. 1999; Singer, van Hoewyk, and Maher 2000; Yu and Cooper 1983), and less invasive, easier to implement respondent selection techniques (O'Rourke and Blair 1983; Tarnai et al. 1987) had higher response rates. As expected, we found that 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, Bates, and Schweitzer 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, this benefit depends on the advance letter being read by the same person who answers the phone when the interviewer calls and that the letter be associated by the potential respondent with the survey. But 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. Furthermore, obtaining addresses and mailing letters uses valuable resources, so implementing this procedure may not enhance response rates because the funds used to pay for it may have been more effectively used to increase response rates in other ways.

Implementing refusal conversion attempts did not yield higher response rates. Although implementing refusal conversions in a single study may increase its response rate (Brick et al. 2003; Curtin et al. 2000; Retzer, Schipani, and Cho 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 might better be devoted to some other, more successful strategy if refusal converters are only rarely successful. Second, the decision to attempt refusal conversions may be made partway through the field period of a study, and researchers may be

particularly likely to attempt refusal conversions if the response rate is 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., Brick et al. 2003; Frankovic 2003; Keeter et al. 2000). 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.

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 of 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 4-70%, 77% of the surveys in our sample had response rates between 20% and 50%, and our findings seems most likely to apply to this range of surveys. Our findings might not generalize to improvements in response rates above 70% or to declines in response rates below 4%.

Our findings should be generalized to studies other than general population RDD surveys with caution as well.

House Effects

The survey administration procedures we examined were confounded with survey organization, because each organization tended to use the same procedures for all of its surveys. This confounding might raise concerns about whether the effects we attribute to procedures are really attributable to “house effects” instead (e.g., Converse and Traugott 1986). In fact, however, we suspect that this is an illusory concern. Differences between surveys that have been attributed to “house effects” are in fact due to differences in survey implementation procedures that can be identified and equated across houses (e.g., Borelli, Lockerbie, and Niemi 1987; Jackman 2004; Lau 1994; McDermott and Frankovic 2003). As Erikson and Wlezien (1999) put it, “house effects represent the consequences of different houses employing different methodologies (p. 170).” Consequently, when two organizations conduct the same survey in exactly the same way, they are likely to produce identical data (see, e.g., Cohen 1982; 1986; Cohen and Potter 1990; Danchik and Drury 1985; Smith 1978). We therefore view house effects as in fact being procedural effects, so our direct examination of procedural effects casts light directly on their impact.

Conclusion

Response rates continue to decrease over time, but lower response rates seem not to substantially decrease demographic representativeness within the range we examined. 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 effort and expense. Consequently, we suspect that Huffington (1998) need not sound her alarm bell quite so vigorously.

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Table 1: Descriptive Statistics for Continuous Variables

Variable	Mean	Standard Deviation	Minimum	Maximum	N
<u>Rates</u>					
Response rate	.30	.13	.04	.70	114
Contact rate	.67	.13	.33	.92	114
Cooperation rate	.44	.15	.09	.84	114
Refusal rate	.29	.09	.04	.55	114
e	.55	.13	.26	.84	114
<u>Demographic Discrepancies (in percentage points)</u>					
Gender ^a	2.30	2.94	.00	17.33	71
Income	3.00	1.88	.60	10.93	74
Race	2.99	3.08	.40	24.90	80
Education	5.68	2.21	1.10	11.08	81
Age	2.20	1.26	.37	5.90	81
<u>Continuous Survey Administration Procedures</u>					
<u>General efforts to contact</u>					
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
<u>Convenience and Respondent Burden</u>					
Interview Length (in minutes)	16.91	7.04	3.50	34.00	89

^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.

Table 2: Descriptive Statistics for Categorical Survey Administration Procedures

Procedure	Value	Number of Surveys	Percent of Surveys
<u>Purpose of survey</u>			
News media release	For media release	92	80.70%
	Not for media release	22	19.30
	Missing	0	0.00
<u>Who to interview</u>			
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	.88
<u>Attempts to provide additional information</u>			
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
<u>Direct efforts to persuade and gain compliance</u>			
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
<u>Convenience and respondent burden</u>			
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
Spanish interviewing	Yes	28	24.56
	No	76	66.67
	Missing	10	8.77

Table 3: Bivariate Associations of Survey Administration Procedures With Response, Contact, Cooperation, and Refusal Rates

	Unstandardized OLS Regression Coefficients				
Procedure	Response Rate	Contact Rate	Cooperation Rate	Refusal Rate	N
<u>Purpose of survey</u>					
For news media release	-.06* (.03)	-.12** (.03)	-.03 (.04)	-.04+ (.02)	114
<u>Who to interview</u>					
National survey	.09** (.03)	.03 (.03)	.11** (.03)	-.002 (.02)	114
List-assisted sampling ^a	.14** (.04)	.10** (.04)	.19** (.04)	.05+ (.03)	99
<u>Respondent selection technique^b</u>					
Youngest male/oldest female at home	-.20** (.05)	-.08 (.06)	-.18** (.07)	.08+ (.04)	113
Last/next birthday at home	-.25** (.06)	-.17** (.06)	-.19** (.08)	.05 (.05)	
Last/next birthday all adult residents	-.34** (.05)	-.23** (.06)	-.31** (.07)	.03 (.05)	
Modified Kish	-.35** (.06)	-.16* (.07)	-.35** (.08)	.17** (.05)	
Other	-.28** (.06)	-.02 (.06)	-.30** (.08)	.16** (.05)	
<u>Attempts to provide additional information</u>					
Sent advance letters	.04 (.04)	.17** (.03)	-.05 (.04)	.09** (.03)	109
Answering machine messages left ^d	.11+ (.07)	.24** (.06)	.04 (.08)	.07 (.05)	96
<u>General contact effort</u>					
Field period length (in days)	.001** (.0002)	.001** (.0002)	.0004* (.0002)	.001 (.0001)	113
Maximum number of call attempts ^c	.005+ (.003)	.02** (.002)	.001 (.003)	.008** (.002)	76
<u>Direct efforts to persuade and gain compliance</u>					
Incentives offered	.12* (.05)	.11* (.05)	.08 (.06)	.02 (.04)	109
Refusal conversions	.03 (.04)	.10** (.04)	-.03 (.04)	.05+ (.03)	109
<u>Convenience and respondent burden</u>					
Interview length (in minutes)	-.006** (.002)	-.001 (.002)	-.008** (.002)	.0005 (.001)	89
Made appointments with any household member	-.04 (.03)	.01 (.03)	-.04 (.03)	.05* (.03)	102
Respondent could call to make appointment	.04 (.04)	.14** (.04)	-.02 (.05)	.06** (.03)	102
Respondent could call to complete interview	.02 (.04)	.16** (.04)	-.05 (.05)	.09** (.03)	101
Spanish interviewing	.05+ (.03)	.03 (.03)	.03 (.03)	-.05* (.02)	104

**p<.01 *p<.05 + p<.10

^aList-assisted sampling was coded 0 if no list assisted sampling was done, .33 for surveys using only 1+ listed blocks, .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.^cFor 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.^dAnswering machine messages were coded 0 if no answering machine messages were left, .5 if they were left some of the time, and 1 if they were always left for all regression analyses.

Note: Standard errors are shown in parentheses.

Table 4: Unstandardized OLS Regression Coefficients Predicting Response, Contact, Cooperation, and Refusal Rates with Survey Administration Procedures

Predictor	Response Rate	Contact Rate	Cooperation Rate	Refusal Rate
<u>Purpose of interview</u>				
For news media release	.03 (.05)	.03 (.08)	-.05 (.07)	-.02 (.06)
<u>Who to interview</u>				
National survey	.10* (.04)	.003 (.05)	.16** (.05)	-.04 (.04)
List-assisted sampling	.12** (.04)	.17** (.05)	.11* (.05)	.14** (.04)
<u>Respondent selection technique^a</u>				
Youngest male/oldest female at home	-.35** (.06)	.01 (.09)	.45** (.08)	.19** (.07)
Last/next birthday at home	-.33** (.06)	-.01 (.09)	-.39** (.08)	.19** (.07)
Last/next birthday all adult residents	-.46** (.05)	-.12 (.08)	-.57** (.07)	.18** (.06)
Modified Kish	-.43** (.06)	.004 (.09)	-.56** (.09)	.31** (.07)
Other	-.28** (.05)	-.05 (.08)	-.26** (.07)	.15* (.06)
<u>Attempts to provide additional information</u>				
Answering machine messages left	-.13 (.11)	.60** (.16)	-.60** (.15)	.42** (.12)
<u>General contact effort</u>				
Field period length (in days)	.001** (.0002)	.0002 (.0003)	.001* (.0003)	.00001 (.0002)
<u>Direct attempts to persuade and gain compliance</u>				
Incentives offered	.10* (.04)	-.07 (.06)	.16** (.05)	-.10* (.04)
<u>Convenience and respondent burden</u>				
Spanish interviewing	.05* (.02)	.03 (.03)	.05 (.03)	-.03 (.02)
R ²	.80	.63	.75	.59
N	87	87	87	87

**p<.01 *p<.05 + p<.10

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

Note: Only variables that were significantly or marginally significantly associated with response rates in the bivariate analyses shown in Table 3 and that had valid data for at least 80% 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% of the 114 surveys and maximum number of call attempts, which was missing for 33% of the 114 surveys. Standard errors are shown in parentheses.

Table 5: Effect of Response Rates on Demographic Representativeness

Demographic Discrepancy	N	Unstandardized Regression Coefficients		R ²
		Linear Effect of Response Rate	Squared Effect of Response Rate	
Gender ^a	71	-9.21* (3.56)	----	.09
Income	74	-4.61* (2.22)	----	.06
Race	80	-8.55* (3.55)	----	.07
Education	81	-29.63** (10.54)	37.79* (16.43)	.13
Age	81	-20.67** (5.51)	23.97** (8.59)	.26

** p<.001 *p<.05

^a The 10 surveys (from 2 organizations) that used gender quotas were excluded from this estimate.

Note: Standard errors are shown in parentheses.

Figure 1