

Manipulating Caller ID for Higher Survey Response in RDD Surveys

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Abstract

The wide adoption of Caller ID technology (estimated at over 50% of U.S. household penetration) poses a serious challenge to random digit dial (RDD) surveys. To the extent that it is used to pre-screen calls, Caller ID can suppress response rates and cooperation by allowing respondents to "pre-refuse" cooperation without ever picking up the telephone. Alternatively, Caller ID may improve cooperation by legitimizing the survey via the text and telephone number displayed to the respondent.

This paper describes an experiment conducted to determine if response rates benefited from the use of Caller ID. Further, we examined whether Caller ID text that explicitly stated the source of the call was more effective than more generic text. During the third quarter of 2006, more than 680,000 cases from the National Immunization Survey (NIS) were randomly divided into three experimental groups. One group had Caller ID deactivated, one group had caller ID activated with the text of "NORC U CHICAGO," and the third group had caller ID activated with the text "TOLL FREE." The NIS—a nationwide, list-assisted RDD survey conducted by NORC for the Centers for Disease Control and Prevention—monitors the vaccination rates of children between the ages of 19 and 35 months. Each year, the NIS conducts interviews with approximately 29,000 households across the United States.

Results of the experiment are mixed regarding the advantages of these different strategies. While transmitting Caller ID (either specific or general) text does result in a higher resolution of telephone numbers, it does not result in higher survey cooperation.

KEY WORDS: telephone surveys, caller ID, RDD response rates

1. Introduction¹

One of the growing challenges faced by telephone survey researchers is persuading respondents to answer the telephone when it rings. Answering machines, voice mail, privacy managers, and caller ID all provide respondents the ability to screen and filter their incoming calls. This ability, in turn, contributes to the well-documented decline in RDD response rates (Battaglia et al. 2006; Curtin et al. 2005; BRFSS 2003).

However, technological innovation is a two-way street. Though call-screening technologies allow respondents to more easily avoid unwanted telephone calls, these technologies also provide researchers with new or alternative channels for communicating with respondents and gaining their cooperation.

This paper explores the implications of one recent technological innovation: caller ID in random-digit-dialing (RDD) surveys. In 2003, 52% of U.S. households were estimated to have caller ID service (Pew 2004). This service allows respondents to see the telephone number, and in some cases the name, of the person or organization calling them. Naturally, this gives respondents the ability to avoid undesired incoming calls. At the same time, however, it also provides researchers an opportunity to communicate with the respondent prior to the telephone being answered.

Previous research on the effect of caller ID on survey response rates has largely been positive (Matos & Krey 2005; Trussel and Lavrakas 2005; Callegaro and McCutcheon 2006) but at least one study has found a negative impact of caller ID among certain populations (Callegaro and McCutcheon 2006).

In order to further explore the relationship between caller ID and RDD response rates, the National Immunization Survey² (NIS) conducted an experiment during Quarter 3, 2006 (NIS 2006 Data Users Guide 2007; Smith et al. 2005). In the experiment, approximately 680,000 cases were randomly assigned to three separate caller ID

¹ The findings and conclusions in this paper are those of the author(s) and do not necessarily represent the views of the Centers for Disease Control and Prevention.

² NIS data is available at <http://www.cdc.gov/nis/>

treatment groups. One group was assigned no caller ID, a second group was assigned a Chicago area telephone number and the text “NORC U CHICAGO,” and a third group was assigned a toll-free number and received text equivalent to “TOLL-FREE.” To fully understand why this design was chosen, it is necessary to first understand how caller ID operates in the United States.

2. The Ins and Outs of Caller ID

Caller ID consists of two separate pieces of information—the telephone number and the name of the caller. These pieces are stored in different locations, routed to respondents in various ways, and, thus, can be manipulated separately by survey researchers.

In a typical call center, the caller ID for a telephone number originates within a call center’s equipment and can be controlled to meet specific business needs. For example, multiple call stations can be set to display the same caller ID telephone number so that any respondents who attempt to return calls can be routed to a dedicated operator rather than calling into individual outbound stations in the call center.

Caller ID text, on the other hand, is stored with the call initiator’s telephone company; it is only transmitted if the information is requested from the call receiver’s telephone service provider. Though variations may exist between telephone companies, this text is typically limited to the some variation of the name listed on the telephone account and must be consistent for all numbers on a particular account. This makes it virtually impossible to conduct experiments where cases are randomly assigned different text (e.g., “NORC” vs. “NORC U CHICAGO”).

Privacy legislation requires that a means of blocking and unblocking caller ID be available (for example, for use by emergency services). Hence, though there is no global means of blocking caller ID, call initiators may transmit a “privacy bit” indicating that caller ID should not be displayed to the receiver. Though caller ID blocking for the most part is reliable, it is possible that the “privacy bit” may be dropped when a call is routed to its respondent, allowing the respondent to view the telephone number and the name of the caller.

Further complicating matters, toll-free telephone numbers are treated differently than numbers with non-toll-free area codes. When a toll-free number is transmitted, no request for a name is made. Thus, regardless of what text a researcher might wish to assign to a toll-free number, respondents will see some variant of “TOLL-FREE NUMBER.”

3. Experimental Design

During Quarter 3, 2006, the National Immunization Survey (NIS) conducted an experiment to determine if response rates benefited from the use of caller ID and, if so, if caller ID text that explicitly stated the source, but also came from a non-toll-free area code, was more effective than generic text from a toll-free number. The NIS—a large nationwide, list-assisted random digit-dialing (RDD) survey conducted by the NORC at the University of Chicago for the Centers for Disease Control and Prevention—monitors the vaccination rates of children between the ages of 19 and 35 months. Each year, the NIS dials approximately 5,000,000 telephone numbers and conducts interviews with approximately 29,000 households across the U.S.

For this experiment, sample was randomly assigned to three groups. The control group broadcast a local (Chicago area code) telephone number and showed the caller ID text of “NORC U CHICAGO.” This is the standard caller ID setting for the NIS and is referred to from here as the “Caller ID on” group. A second group had caller ID turned off and, therefore, had no caller ID assigned³ (and is referred to from here as the “Caller ID off” group). The third group broadcast a toll-free number and, was assigned caller ID text by the respondent’s local telecommunication company (typically this text would be “TOLL-FREE NUMBER” or an equivalent).

Sample sizes were chosen in order to detect a 1% point change in the resolution, screener, or eligibility rates. Due to the low eligibility rate of the NIS, however, only differences larger than approximately 3% points would be deemed significant when comparing completion rates (we also compare the overall Council of American Survey Research Organizations (CASRO) response rate and the rate at which respondents gave consent for researchers to follow-up with the respondent’s vaccination provider). Table 1 displays the sample sizes selected for each group.

Table 1: Sample Sizes for the NIS Caller ID Experiment

<i>Group</i>	<i>N</i>
Caller ID on	227,579
Caller ID off	227,989
Toll-free number	227,968

³ In the event the privacy bit was dropped during the routing of the call, these respondents would receive the same treatment as the first group.

4. Results

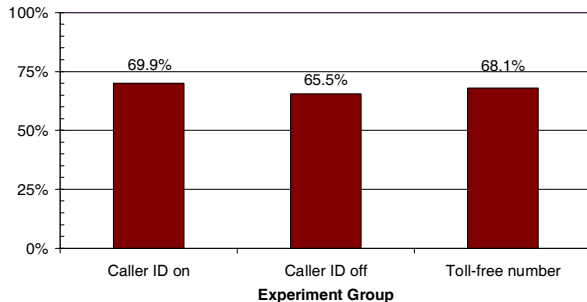
Pair-wise Chi-square comparisons were made between the three groups on the survey rates mentioned previously. The overall Chi-square tests for multiple comparisons did not change our interpretation of the pair-wise comparison presented below.

3.1 Resolution Rate

The resolution rate measures a survey’s ability to classify or “resolve” telephone numbers (for example, as non-working, businesses, households, etc.). It is calculated by dividing the number of resolved telephone numbers by the total number of telephone numbers released.

The “Caller ID on” group had the highest resolution rate (69.9%). The “Caller ID off” group had the lowest (65.5%). The differences between the “Caller ID on” group and both the “Caller ID off” ($\chi^2=1014.8$, $df=1$, $p<.0001$) and “Toll-free number” ($\chi^2=184.8$, $df=1$, $p<.0001$) groups were statistically significant. Further, the “Toll-free number” group is significantly different from the “Caller ID off” group ($\chi^2=334.2$, $df=1$, $p<.0001$).

Figure 1: Resolution Rate Comparison for the 2006 NIS Caller ID Experiment⁴



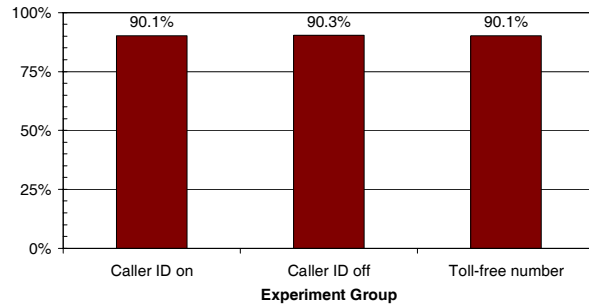
3.2 Screener Rate

The screener rate measures a survey’s ability to determine a household’s eligibility to participate in a survey. It is calculated by dividing all screened household telephone numbers by all resolved household telephone numbers.

⁴ The resolution rate excludes prescreened telephone numbers, which were not included in this experiment. Thus, this number does not reflect the true NIS resolution rate.

All three groups had approximately the same screener completion rate (ranging from 90.3% for the “Caller ID off” group to 90.1% for both the “Caller ID on” and “Toll-free number” group. These differences were not statistically significant.

Figure 2: Screener Rate Comparison for the 2006 NIS Caller ID Experiment

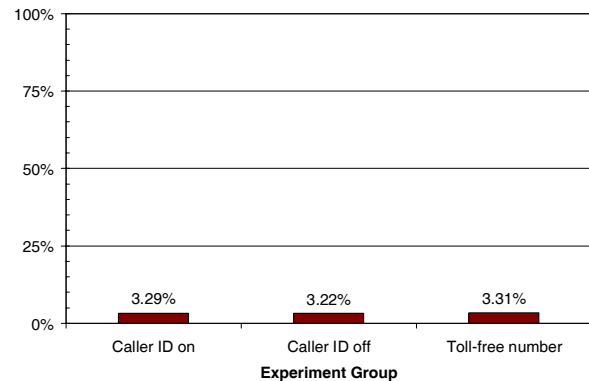


3.3 Eligibility Rate

The eligibility rate measures the proportion of screened households that are eligible to participate in the survey. It is calculated by dividing the number of eligible households by the number of screened households.

The Eligibility rate ranged from 3.31% for the “Toll-free number” group to 3.22% for the “Caller ID off” group. No pair-wise differences were statistically significant.

Figure 3: Eligibility Rate Comparison for the 2006 NIS Caller ID Experiment



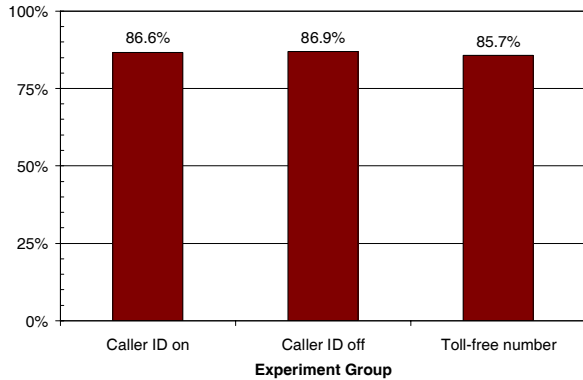
3.4 Interview Completion Rate

The interview completion rate measures the proportion of respondents who complete the survey. It is calculated by dividing the number of households who completed the

questionnaire through the demographic section by the number of eligible households.

We found a interview completion rate of 86.9% for the “Caller ID off” group, 86.6% for the “Caller ID on” group, and 85.7% for “Toll-free number.” None of these differences were statistically significant.

Figure 4: Interview Completion Rate for the 2006 NIS Caller ID Experiment

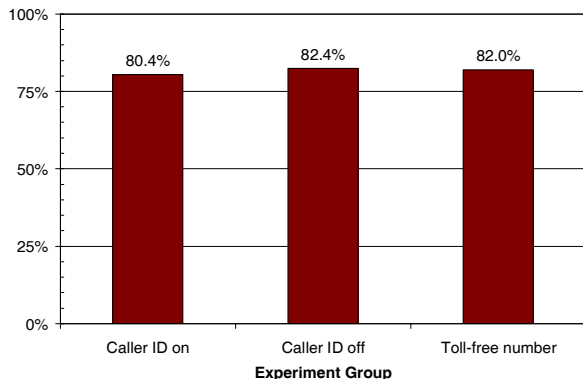


3.5 Consent Rate

The consent rate measures the ability to secure respondent consent for a follow-up survey with the respondent’s immunization providers. It is calculated by dividing the number of households giving provider consent by the number of households with completed NIS interviews.

The “Caller ID off” group’s consent rate (82.4%) followed by the “Toll-free number” group (82.0%) and “Caller ID on” group (80.4%). None of these differences were statistically significant.

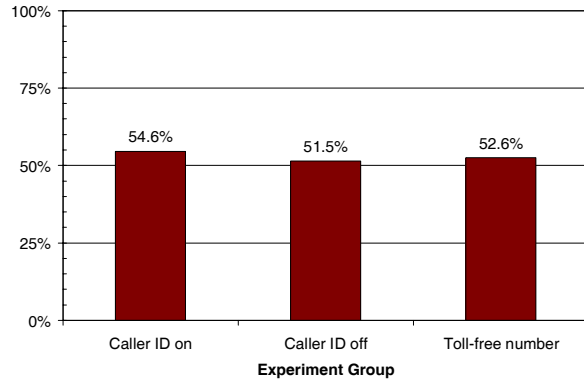
Figure 5: Consent Rate Comparison for the 2006 NIS Caller ID Experiment



3.6 CASRO Rate⁵

The “Caller ID on” group’s CASRO rate was 54.6%, followed by “Toll-free number” group (52.6%) and “Caller ID off” group (51.5%). The “Caller ID group” was significantly higher than the “Caller ID off” group ($Z=2.23$, $P=.02$). No other differences, however, were statistically significant.

Figure 6: CASRO Rate Comparison for the NIS Caller ID Experiment⁶



3.7 Final Response Categories

Finally, in table 2 we present a detailed breakout of the final response categories for all cases included in this experiment. Only small differences exist in these categories for most response categories. The exceptions are in the percentage of cases coded as answering machine cases (where the “Caller ID on” group had substantially more cases) and the percentage of cases coded as ineligible households (where the “Caller ID off” group had substantially fewer cases). The implications of this are discussed in more detail below.

⁵ Resolution Rate * Screener Rate * Completion Rate

⁶ Because the resolution rate excluded prescreened numbers and because resolution rate is a component of CASRO, these rates do not reflect the true NIS CASRO rate.

Table 2: Response Categories for the NIS Caller ID Experiment

<i>Response Category</i>	<i>Caller ID on (%)</i>	<i>Caller ID off (%)</i>	<i>Toll-free no. (%)</i>
Non-working, Out-of-Scope	21 (46,877)	21 (47,140)	21 (47,608)
Non-residential	9 (19,622)	8 (19,234)	9 (19,634)
Non-contact	15 (33,234)	14 (32,406)	15 (33,878)
Answering Machine	6 (12,786)	11 (24,319)	7 (15,612)
Known Household, unscreened	4 (9,163)	4 (8,010)	4 (8,674)
Likely Household, unscreened	10 (22,413)	10 (21,893)	10 (23,307)
Ineligible Household	35 (80,735)	32 (72,576)	34 (76,632)
Household Partial	0 (367)	0 (315)	0 (375)
Household Complete	1 (2,389)	1 (2,096)	1 (2,248)
Total	100 (227,586)	100 (227,989)	100 (227,968)

4. Discussion

The results presented in this paper suggest that it is inadvisable to block caller ID on general population RDD surveys. By not including the “privacy bit” (in the “Caller ID on” and “Toll-free number” groups) the CASRO response rate improved over two percentage points. The results also suggest that more specific caller ID text (in this case, “NORC U CHICAGO”) is preferable to generic text attached to a Toll-free number.

An examination of the CASRO component rates suggest that the positive benefit of caller ID begins and ends with persuading the respondents to pick up the telephone. No differences were found between the three treatment groups in the likelihood to complete the screening process or the interview. But both the Caller ID on and the Toll-free number groups had significantly higher resolution rates.

Table 2 explores this phenomenon in more detail by dividing all the experimental cases into final response categories. Notice that many of the categories are remarkably consistent across treatment groups. The two exceptions are in the “Answering Machine” category where the caller ID group had a much higher (11%) proportion of respondents than the other two groups and the ineligible households where the caller ID off group had a relatively lower proportion of respondents (32%).

It appears that caller ID’s primary impact is that it persuades respondents to answer their telephone. Without caller ID, a substantial proportion of respondent’s will

simply let the answering machine answer the call. But by broadcasting a caller ID, respondents are more willing to pick up the telephone and at least presenting interviewers a chance to complete the interview.

In previous research on caller ID, Callegaro and McCutcheon (2006) suggest that Caller ID be considered a “compact advance letter” that builds rapport and fosters social exchange. These results, however, suggest caller ID may be more analogous to a peep-hole in a face-to-face interview. Presenting a friendly face is necessary to get respondents to open the door, but insufficient to prevent them from slamming it closed again.

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