

# How Interviewer Strategies Relate to Contact and Cooperation in the National Health Interview Survey, 2004

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## Introduction

The decline in completion rates for Federal surveys has been a major concern of statistical agencies in the past decade (Atrostic, et al., 2001). The National Health Interview Survey (NHIS) is a Nationally representative annual household survey of general health of the civilian, non-institutionalized population of the United States, and is conducted by the Census Bureau. As with most other national surveys, nonresponse rates for the National Health Interview Survey (NHIS) have more than doubled in the past decade (see Figure 1). Both noncontact and refusal rates have increased steadily over the past 10 years. For the interviewer, the challenge is two-fold: first making contact with the sample household member(s), and second, gaining their cooperation to participate in the survey. Groves and Couper (1996) state that the decision to cooperate or refuse is shaped in large part by the interactions between householders and interviewers: interviewers can act in ways which change the tendency of a potential respondent to participate.

A variety of methods to counteract refusals in Federal surveys have been explored. Groves et al. (1992) described how field strategies, such as the use of informational materials and adapting one's approach to suit the sample unit, may increase participation. Groves and Couper (1998) described a wide range of issues related to nonresponse including the influence of household characteristics, environmental issues, interviewer characteristics, and the interviewer/householder interaction on survey cooperation. Improvement in response rates in Federal surveys depends in part upon first making contact with a busy public and then counteracting reluctance on the part of householders to participate once contact is made. Improving the efficiency in these areas will enhance this effort.

Previous research has documented the utility of collecting detailed contact or call record data for the systematic study of nonresponse in face-to-face surveys (Bates, 2003; Campanelli, Sturgis, and Purdon, 1997; Groves and Couper, 1998; Purdon, Campanelli, and Sturgis, 1999). Wanting to utilize this source of important information, a Contact History Instrument (CHI) was implemented in the 2004 NHIS to capture critical information on each contact and contact attempt. Interviewers use the CHI, for example, to record information on access impediments and strategies employed to induce contact and cooperation. As such, the CHI provides a record of interventions used to combat nonresponse in the NHIS. This paper explores the effect of various interviewer strategies, such as leaving notes, promotional materials, "no one home" letters, checking with neighbors and others, on making contact and gaining subsequent participation. To evaluate the impact of these strategies, three specific research questions were explored. (1) What strategies are interviewers using and in what combination; (2) How do interviewers shift strategies to suit specific field situations; and (3) How do strategies used on the first attempt relate to contact and cooperation outcomes in subsequent attempts. By exploring the use of interviewer strategies in the NHIS, we can identify the most effective strategies and increase their use in the field as well as enhance the development of additional strategies for reducing nonresponse in surveys.

## Data Source

The National Health Interview Survey (NHIS) is conducted by the National Center for Health Statistics which is part of the Centers for Disease Control and Prevention. NHIS data are collected by U.S. Census Bureau interviewers utilizing computer-assisted personal interviewing (CAPI). The analyses presented in this paper rely exclusively on contact attempt history data collected with the 2004 NHIS. Contact history data are collected via CHI, which is either auto-launched from the main NHIS instrument or accessed from Case Management, the system by which interviewers access, manage, review, and submit cases.

Data from approximately 200,000 contacts and contact attempts on over 70,000 cases were captured in the 2004 CHI components to the NHIS. Our analyses, however, are restricted to 42,155 eligible or in-scope households because these are the cases on which the NHIS bases its response rates. Interviewers made 141,448 contact attempts on these cases. Because the CHI was not only new to the NHIS in 2004, but also the pioneer for surveys conducted by the Census Bureau, minor errors occurred in the programming, design, and use of the instrument. These errors resulted in an additional 1,011 eligible cases (2.3% of total) which had no CHI data. Through design modifications and training, these problems were corrected for the 2005 CHI instrument. All analyses were conducted using SAS (version 8.2, SAS Institute, Inc., Cary, NC) and SUDAAN (version 9.0, Research Triangle Institute, Inc., Research Triangle Park, NC).

## Results

To address our research questions, we used CHI data on the specific strategies interviewers employ on each contact or contact attempt. Regardless of the outcome of the attempt, interviewers record the strategies they use at that attempt on a strategy screen listing 20 different interviewer strategies in addition to “none used” and “other, specify” (see Table 1). Interviewers are instructed to record all strategies used for each contact attempt.

**Table 1: Strategies Identified in CHI**

<ul style="list-style-type: none"> <li>• Advance letter given or left at household</li> <li>• Scheduled appointment or return time</li> <li>• Left note or appointment card</li> <li>• Handed out or left promotional packet or informational brochure</li> <li>• Telephoned household</li> <li>• Left message on answering machine</li> <li>• Requested “no-one-home” letter be sent to household</li> <li>• Requested “refusal letter” be sent to household</li> <li>• Requested “better understanding or cooperation” letter be sent to household</li> <li>• Requested “building or manager access” letter be sent to household</li> <li>• Called persons listed as “recontact” persons for household</li> </ul>	<ul style="list-style-type: none"> <li>• Staked-out household</li> <li>• Checked with neighbors to learn more about household</li> <li>• Contacted other family of household members</li> <li>• Contacted property manager to learn about property or household</li> <li>• Checked with County assessor, post office, or permit office to help locate property</li> <li>• Checked the on-line tracking database for more information about the address</li> <li>• Sought help from supervisor or regional office</li> <li>• Transferred case to interviewer that speaks a different language</li> <li>• Transferred case for reassignment</li> <li>• None</li> <li>• Other, specified</li> </ul>
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To improve data usability and the interpretation of results, a factor analysis was performed to condense the first 18 of these categories into a smaller set of conceptual groupings. The resulting nine groupings of strategies include: (1) Giving an advance letter; (2) Leaving a note or appointment card at the door; (3) Leaving or handing out a promotional packet or brochure; (4) Scheduling a time for an appointment with the respondent; (5) Trying to find respondent at home by requesting a no-one-home letter, checking with neighbors, or staking-out the household; (6) Calling household including leaving a message on the answering machine; (7) Searching for the correct address by checking with the county assessor, post office, or permit office or searching an on-line tracking database; (8) Counteracting refusals by requesting a refusal letter, better understanding letter, or seeking help from supervisor or regional office; and (9) Gaining access to the household by requesting a building manager/access letter or contacting the property manager. Four categories were dropped from the analysis due to small numbers: “Transfer case to interviewer that speaks a different language” (0.5 % of first attempt CHI data), “Transfer case for reassignment” (0.6 % of first attempt CHI data), “Called recontact persons” (0.2 % of first attempt CHI data) and “contact other family members” (1.0 % of first attempt CHI data). The “Other, specify” category (2.1 % of first attempt CHI data) was not included in these analyses and the “None” category (15.6 % of first attempt CHI data) was included in some analyses.

## Strategies Used by Interviewers

Table 2 represents the distribution of strategies across each of the first three attempts. Strategies that involve giving materials to the respondent (or leaving materials at the household in the case of noncontacts) are the most frequent across all three attempts. For first attempt, these include giving an advance letter (43.3 %), leaving a note/appointment card (38.7 %) and leaving a promotional packet (24.3 %). As the number of attempts increases, the use of handing or leaving materials, while still most frequent, decreases. For example, use of an advance letter

declines from 43.3 % on first attempt to 30.0 % on third attempt. Conversely, as the number of attempts increases, the use of strategies related to making contact with the respondent increases. Telephone calls to the household increase from 4.6 % on the first attempt to 21.7 % on the third attempt. Scheduling appointments and “looking” strategies also increase from first to third attempt.

**Table 2: Percent Distribution of Strategies on First, Second, and Third Attempts**

	<b>First Attempt N=42,156<sup>1</sup></b>	<b>Second Attempt N=29,721<sup>2</sup></b>	<b>Third Attempt N=20,335<sup>3</sup></b>
<b>1. Advance letter</b>	43.3%	34.5%	30.0%
<b>2. Note/appt. card</b>	38.7	35.4	33.9
<b>3. Promotional packet</b>	24.3	22.7	20.6
<b>4. Schedule appt.</b>	9.8	13.5	13.6
<b>5. Looking</b>	7.6	11.3	12.9
<b>6. Calling</b>	4.6	14.9	21.7
<b>7. Address searching</b>	3.3	3.7	3.7
<b>8. Refusal counteracting</b>	2.7	4.6	5.7
<b>9. Property access attempt</b>	2.3	2.2	2.0

NOTE: Totals exceed 100 % because more than one strategy may be used per attempt

<sup>1</sup> Cases that had CHI data for 1<sup>st</sup> attempt

<sup>2</sup> Cases that had CHI data for 2<sup>nd</sup> attempt

<sup>3</sup> Cases that had CHI data for 3<sup>rd</sup> attempt

One might expect that as the number of attempts increases so would the use of different strategies because interviewers are trying to complete the interview before closeout. To examine this, we looked at the number of individual strategies used for attempts one through five, using the original twenty categories on the strategy screen (table 3). By performing a count of how many different strategies were used per attempt rather than looking at specific strategies, we were able to carry this analysis across the first five attempts rather than the first three without the numbers becoming too small to report. Interestingly, while the use of just one strategy per attempt decreases slightly across the first five attempts (from 50.2 % to 45.5 %), it remains the most frequent. Also of note is that the use of zero and three or more strategies per attempt increase as the number of attempts increase (from 15.4 % to 21.9 % for zero strategies and from 13.9 % to 21.1 % for three or more strategies).

**Table 3: Percent Distribution of the Number of Different Strategies Used on Each of Attempts One Through Five**

<b>Number of Strategies</b>	<b>First Attempt N=42,156<sup>1</sup></b>	<b>Second Attempt N=29,721<sup>2</sup></b>	<b>Third Attempt N=20,335<sup>3</sup></b>	<b>Fourth Attempt N=13,995<sup>4</sup></b>	<b>Fifth Attempt N=9,816<sup>5</sup></b>
<b>0</b>	15.4%	17.9%	19.8%	21.3%	22.0%
<b>1</b>	50.2	46.9	45.8	45.2	46.0
<b>2</b>	20.5	16.7	14.4	12.5	11.5
<b>3+</b>	13.9	18.5	20.0	21.0	21.1

<sup>1</sup> Cases that had CHI data for 1<sup>st</sup> attempt

<sup>2</sup> Cases that had CHI data for 2<sup>nd</sup> attempt

<sup>3</sup> Cases that had CHI data for 3<sup>rd</sup> attempt

<sup>4</sup> Cases that had CHI data for 4th attempt

<sup>5</sup> Cases that had CHI data for 5th attempt

### **The Tailored Use of Strategies for Contacts, Interim Refusals, and Noncontacts on First Attempt**

In this section, we explore the use of strategies on first attempt across three possible outcomes for the attempt: contact, interim refusal, and noncontact. The 2004 CHI instrument was designed so that interviewers made the determination of outcome and recorded the outcome for each attempt. Contact included any communication with the sample unit other than interim refusals, interim refusals included a combination of expressed hesitance and passive refusals on the part of sample unit members, and noncontact included attempts in which the interviewer neither saw nor spoke to persons from the sample unit. For contacts and interim refusals, it is impossible to discern whether the determination of outcome took place before or after the use of a particular strategy. For example, the interviewer may have given the respondent the advance letter before or after the respondent indicated reluctance to participate. Examination of strategies used on first attempt by outcome of first attempt enables us to learn how interviewers are tailoring the use of strategies to suit the particular field situation. Table 4 shows the distribution of strategies on first attempt by outcome of the first attempt.

**Table 4: Percent Distribution of Strategies on First Attempt by Outcome of First Attempt**

	<b>Contact N=21,813<sup>1</sup></b>	<b>Interim Refusal N=1,877<sup>2</sup></b>	<b>Noncontact N=18,466<sup>3</sup></b>
<b>1. Advance letter</b>	54.7%	51.7%	28.9%
<b>2. Note/appt. card</b>	25.1	32.1	55.8
<b>3. Promotional packet</b>	30.1	27.5	16.9
<b>4. Schedule Appt.</b>	17.0	4.9	1.2
<b>5. Looking</b>	5.6	8.5	10.1
<b>6. Calling</b>	5.5	8.2	3.3
<b>7. Address searching</b>	2.7	3.2	4.1
<b>8. Refusal counteracting</b>	2.8	37.8	1.2
<b>9. Property access attempt</b>	1.6	2.8	3.1

NOTE: Totals exceed 100 % because more than one strategy may be used per attempt

<sup>1</sup> Cases that had CHI data on first attempt and resulted in Contact outcome on first attempt

<sup>2</sup> Cases that had CHI data on first attempt and resulted in Interim Refusal outcome on first attempt

<sup>3</sup> Cases that had CHI data on first attempt and resulted in Noncontact outcome on first attempt

Interviewers used the advance letter and promotional packet more for contacts and interim refusals than for noncontacts. This is most likely because these are handed directly to the respondent rather than left at the door. Similarly, they used note/appointment card more for noncontacts than for contacts or interim refusals because these

are left at the door and allow for a personalized hand-written message. Also of note in Table 4 is that the use of refusal (which includes requesting refusal letter, requesting better understanding letter, and/or seeking help from supervisor/regional office) is much more frequent for interim refusals (37.8 %) than for either contacts or noncontacts (2.8 % and 1.7 %, respectively). This is consistent with what one would expect because interim refusals are cases for which the interviewer has noted hesitancy or reluctance on the part of the respondent early in the contact.

We were also interested in the differences in the number of strategies used based on outcome. One might expect that interviewers used more strategies for interim refusals than for contacts or noncontacts because reluctance has been shown on the part of the respondent. Table 5 examines the number of strategies used on the first attempt by the status of the first attempt. The use of two or 3+ strategies is more frequent for interim refusals than for contacts or noncontacts. Conversely, the use of no strategies or only one strategy is more frequent for both contacts and noncontacts compared to interim refusals. From these data, it appears that interviewers indeed tailor their approach by using a variety of strategies when they encounter hesitant respondents.

**Table 5: Percent Distribution of Number of Strategies Used on First Attempt by Status**

<b>Number of Strategies</b>	<b>Contact N=21,813<sup>1</sup></b>	<b>Interim Refusal N=1,877<sup>2</sup></b>	<b>Noncontact N=18,466<sup>3</sup></b>
<b>0</b>	13.2%	8.6%	18.3%
<b>1</b>	49.7	38.5	51.4
<b>2</b>	21.2	24.7	19.5
<b>3+</b>	15.9	28.2	10.8

<sup>1</sup> Cases that had CHI data on first attempt and resulted in Contact outcome on first attempt

<sup>2</sup> Cases that had CHI data on first attempt and resulted in Interim Refusal outcome on first attempt

<sup>3</sup> Cases that had CHI data on first attempt and resulted in Noncontact outcome on first attempt

Another question we explored is whether interviewers shift the strategies they use after encountering consecutive noncontacts. One would expect that they would try new approaches as the attempts continue. Figures 2 and 3 represent the use of strategies across consecutive noncontacts and contacts, respectively. The figures show interviewers do shift strategies somewhat across attempts with the same outcome. As they encounter consecutive noncontacts, interviewers decrease the use of advance letter (from 28.7 % on the first attempt to 18.4 % on the third attempt) and increase strategies aimed at finding the respondent (looking category increases from 9.2 % to 21.4 % across attempts) and interviewers also increase calls to the sample unit (from 3.1 % to 12.3 % across attempts). A similar drop in the use of advance letter occurs for consecutive contacts (from 54.7 % to 39.7 %), while scheduling appointments and calls to the sample unit increase (from 17.0 % to 26.6 % for appointments and 5.5 % to 31.5 % for calls). It is important to note, however, that Figure 3 includes all types of contacts, both positive (e.g. scheduling an appointment) and negative (e.g. encountering reluctance) and so the effects may be more conservative.

### **The Impact of Interviewer Strategies Used on First Attempt on Making Contact and Gaining Participation on Second Attempt**

In order to see if the use of certain strategies relate to either making contact or gaining participation, we looked at outcomes on the second attempt by strategies used on the first attempt.<sup>1</sup> The premise is that the strategies used on a given attempt would relate to the outcome of the next attempt.<sup>2</sup> This is particularly true for noncontacts because the majority of strategies include ways to find the housing unit or to reach respondents who are not home.

<sup>1</sup> We did not explore second attempt outcomes for first attempt interviews and appointments (both an outcome and a strategy).

<sup>2</sup> Furthermore, we cannot determine when a particular strategy was used during an attempt that resulted in contact. Thus, a significant association may emerge between first attempt interviews and the use of promotional materials on that attempt, but we don't know if the materials were being used to induce participation, as a "thank you" gift at the close of an interview, or both.

For the first attempt cases resulting in noncontact, interim refusal, or "other" contact, we conducted two sets of bivariate analyses. For each of these first attempt outcomes, we first explored the relationship between using or not using a strategy on first attempt and making contact (versus noncontact) on second attempt. Next, for those cases contacted on second attempt we explored the relationship between using or not using a strategy on first attempt and the second attempt contact outcome: interview/appointment, interim refusal, and "other" contact. Chi-square tests of independence were performed to identify significant relationships, with the level for detecting statistical significance set at  $\alpha=0.05$ .

Figures 4 and 5 present outcomes of second attempts by strategies used for noncontacts on the first attempt. The distribution of outcomes looks very similar across strategies and no significant associations were identified between the use of any of the nine groups of interviewer strategies on the first attempt and making contact on the second attempt. Additionally, when contact was made on second attempt, strategies used on first attempt had no significant impact on second attempt "contact" outcomes (interview/appointment, interim refusal, "other").

Figures 6 and 7 show second attempt outcomes by the strategies used for interim refusals on the first attempt. Similar to noncontacts, the distribution of outcomes looks very similar across strategies, with the exception of three: use of promotional materials, the use of "address" strategies, and the use of "refusal" strategies (requesting refusal letter, requesting better understanding letter, or seeking help from supervisor/regional office). Use of promotional materials with first attempt interim refusals, versus non-use, was significantly associated with a higher noncontact rate on second attempt (figure 6;  $df=1, p=.02$ ). Similar results emerge for the use of "address" strategies (figure 6;  $df=1, p=.05$ ). The finding for promotional materials is surprising because Groves et al. 1992 state that "interviewers who give respondents informational letters, brochures, and so on prior to asking for participation will get better compliance than those who do not..." and likely reflects a spurious relationship, one that would disappear when controlling for factors such as time of contact attempt. In contrast, the finding for "address," given that the strategies involved are used when the household is difficult to find, seem plausible.

Focusing on second attempts that resulted in contact outcomes (interview/appt., interim refusal, or "other" contact) and which had outcomes of interim refusal on the first attempt (see figure 7), use of "refusal", versus non-use, was associated with a lower interview/appointment rate and an increased rate of "other" contact ( $df=2, p=.00$ ). These results are likely due to interviewers using the "refusal" strategies with cases that are likely to refuse again. A better assessment of the use of "refusal" strategies would result from comparisons of use versus non-use among a subset of "highly reluctant" households.

Next we looked at first attempt "other" contact households (figures 8 and 9). These were households interviewers were able to contact on first attempt, but were not classified as interim refusals, were not interviewed, and were reluctant to schedule an appointment for an interview. Interestingly, the use of notes ( $df=1, p=.00$ ), promotional materials ( $df=1, p=.01$ ), "refusal" strategies ( $df=1, p=.03$ ), and "address" strategies ( $df=1, p=.03$ ) on first attempt, compared to not using these strategies, was associated with a lower second attempt contact rate (see figure 8). While one would expect interviewers to use "refusal" and "address" strategies more for cases that are initially more difficult, more research needs to be conducted to learn whether the use of notes and promotional materials are used more for these cases as well.

Also of interest is that the use of "appointment" strategies on first attempt compared to non-use was associated with a higher second attempt contact rate (figure 8;  $df=1, p=.01$ ). Additionally, the use of "appointment" strategies increased the likelihood of getting an interview/appointment with first attempt "other" contact households (see figure 9), while reducing the percentage of second attempt interim refusals and "other" contacts ( $df=2, p=.00$ ). These "scheduling" results are interesting because interviewers did not report formally scheduling appointments with these households earlier in the CHI instrument. This indicates that in the absence of a more formal arrangement, the mere mention (verbally or in written form) of a return time may have a strong beneficial effect. Lastly, compared to non-use, the use of "refusal" strategies with first attempt "other" contact cases was significantly associated with a lower interview/appointment rate and higher interim refusal and "other" contact rates (figure 9;  $df=2, p=.00$ ). As noted earlier, these findings more likely reflect the characteristics of the households involved as opposed to the utility of the strategy.

Finally, we assessed the impact of strategies on first contact outcomes using data for attempts two through six (table not shown).<sup>3</sup> Only one strategy group, calling the household (versus not calling), was significantly associated with first contact outcomes. Use, versus non-use, of this strategy led to slightly higher interview and refusal rates, and slightly lower appointment and “other” contact rates ( $df=3, p=.03$ ).

## Discussion/Future Steps

Based on this initial review of the way strategies are being used by interviewers, it appears that they are being applied appropriately. This is evidenced by the fact that giving and leaving materials are the most frequently applied strategies, which is consistent with prior research that has found that informational materials help to increase participation. While we did see that interviewers use more strategies for interim refusals than for contacts or noncontacts, the use of only one strategy was still most frequent. Also of note is that the use of zero and three or more strategies increased as the number of attempts increased. Further investigation is needed to determine if there are two groups of interviewers, those trying harder and those giving up, or if something else is going on such as the use of no strategies relating to cases where the interviewer has started the interview and therefore sees no reason to use more strategies. We also saw that strategies used on the first attempt did not appear to be strongly related to what happened on the next attempt, even when compared to the use of no strategies. This result may change if the data were disaggregated into difficult versus non-difficult cases. Further research is needed to determine whether the use of strategies has a stronger impact on difficult cases.

Another interesting finding from this research is that interviewers are using strategies differently for interim refusals than for either contacts or noncontacts, suggesting interviewers change strategies to meet field situations. For example, advance letters and promotional packets are used more for contacts and noncontacts, while notes are used more for interim refusals. Also, more strategies are used for interim refusals on the first attempt than for either contacts or noncontacts. One area that may be of concern is that using only one strategy is the most frequent across attempts, even when dealing with multiple noncontacts or potential refusals. It could be, however, that interviewers are using additional strategies, but those strategies are not listed among the response options on the strategy screen. For example, prior research has shown that respondents’ positive feelings toward the sponsoring agency, interviewers explaining to respondents that their responses represent thousands of others, and interviewers developing and maintaining a rapport with the respondent all increase participation rates (Groves and Couper, 1998). None of these is listed as a strategy option. In the future, it may be useful to redesign the CHI instrument to capture additional strategy options.

In addition to adding more response options, it would be very useful to have additional information on the actual doorstep interaction between the interviewer and householder. It would be useful to know exactly how interviewers are tailoring their approach to the unique householder and what original strategies they are employing. For example, an examination of the “other: specify” categories in CHI revealed that interviewers record a wide variety of strategies not listed in the instrument. For example, one interviewer considered bringing “home grown peaches” to the doorstep to be a strategy for gaining participation (Taylor, 1995). This type of very specific and unique information could be captured in several ways such as in a battery of questions that would allow for verbatim information or in digital recordings of the doorstep interaction. These possibilities should be explored for the future.

## Data Limitations

The NHIS was the first survey conducted by the Census Bureau to adopt CHI in 2004. We anticipated a learning curve with its use, especially during the first one to two quarters. To date, preliminary analyses by quarter have revealed few differences in the results we present, and this is certainly encouraging. We do know, however, that roughly 2.5% of cases are missing CHI records, suggesting that underreporting of attempts was likely. Another limitation is that we are unable to infer causality between the use of a given strategy and outcome. This is because it is likely that the same factors that determine which strategy an interviewer will use also have a key role in determining the outcome, such as in the case of an interviewer requesting a better understanding letter for a hesitant respondent.

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<sup>3</sup> We limited the analysis to the first six attempts since roughly 97% of all households were contacted by this point. We also exclude first attempt contacts so that we can maintain temporal ordering when exploring the impact of strategies on first contact outcomes.

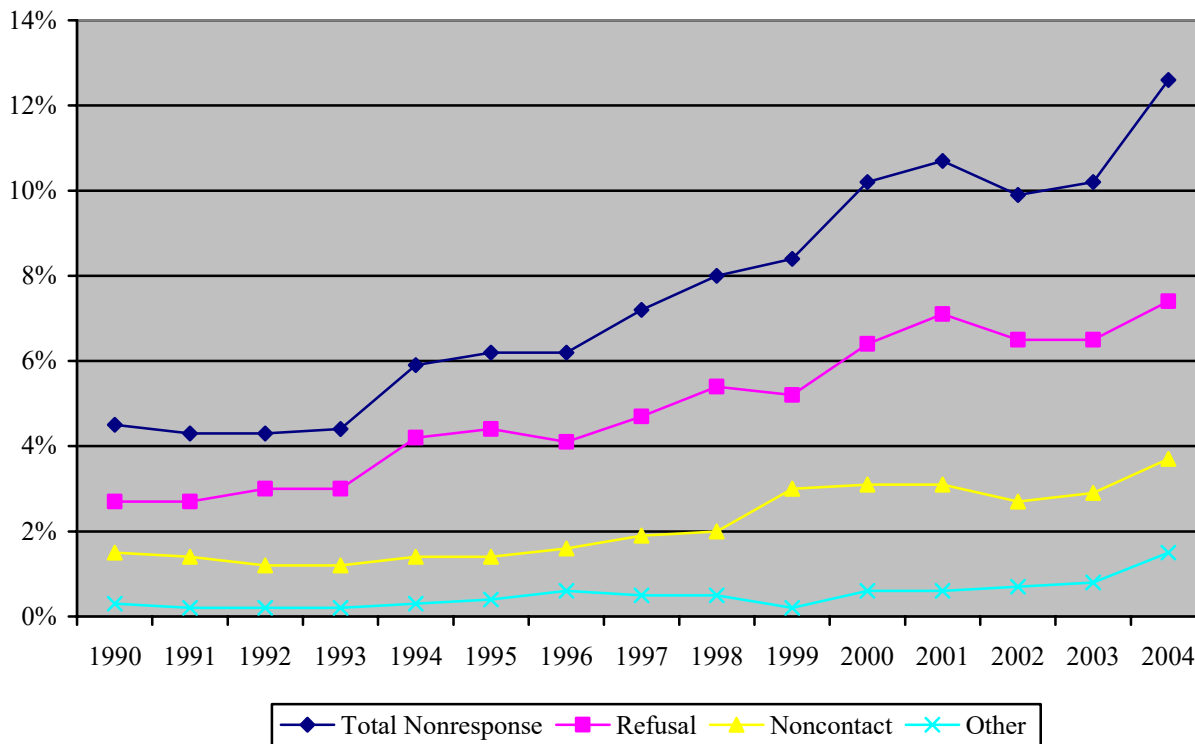


There are several potential problems with the specific data on strategies used for this analysis. First, we have received feedback from interviewers that it was not clear that only strategies used on a given attempt should be recorded for that attempt. Thus, for a given attempt, some reporting of strategies for previous attempts occurred, creating over-reporting of strategies. Additionally, we know from examining the data that some attempts did not get categorized properly with regard to status (contact, noncontact, interim refusal). For example, some contact with non sample unit members (i.e., neighbors, other family) were recorded as contacts. Many of these problems have been addressed in the 2005 CHI instrument, and although we suspect that the impact on the substantive conclusions was limited, we look forward to performing additional analysis on the 2005 CHI dataset.

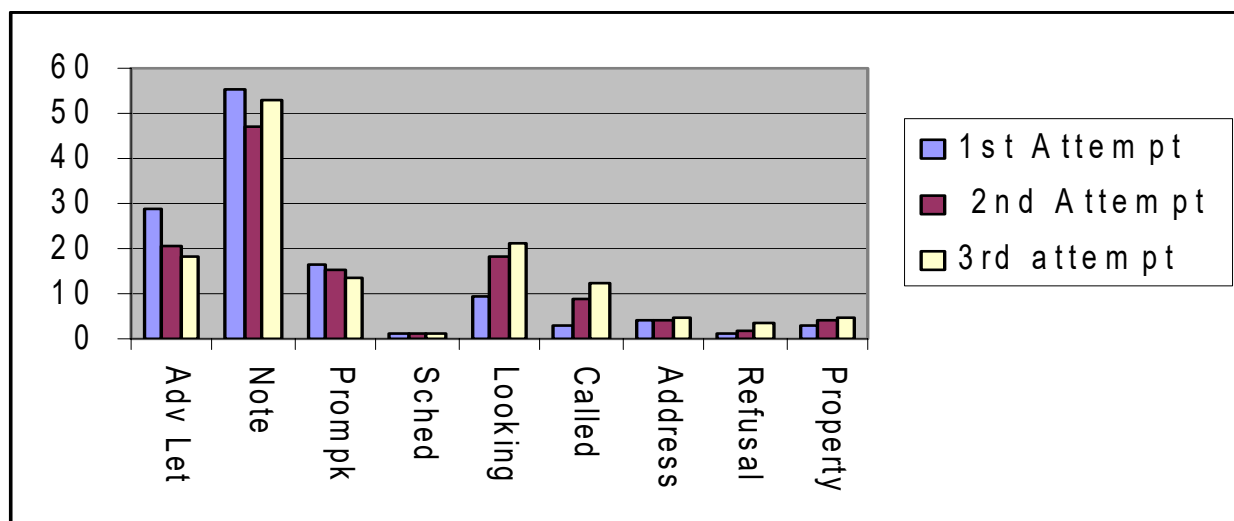
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**Figure 1. Household Nonresponse in the National Health Interview Survey, 1990-2004**



**Figure 2: Strategies Used for Noncontacts Across Attempts**  
 1<sup>st</sup> Attempt N=18,466<sup>1</sup>, 2<sup>nd</sup> Attempt N=12,361<sup>2</sup>, 3<sup>rd</sup> Attempt N=9,228<sup>3</sup>

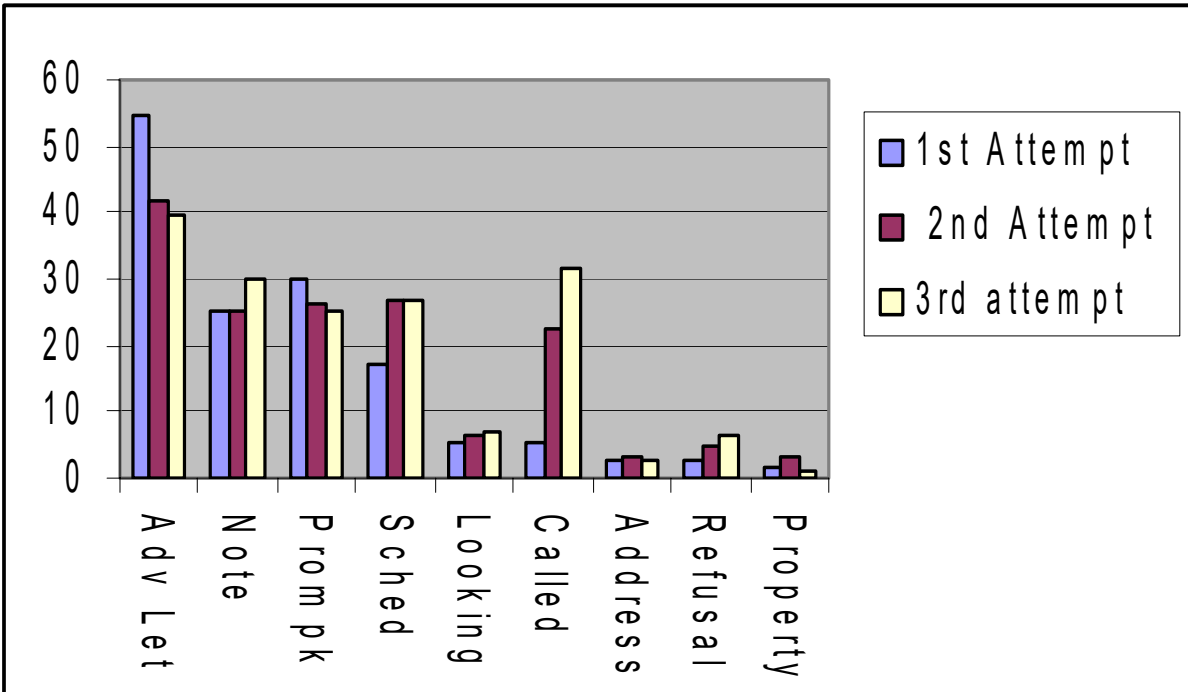


<sup>1</sup> Cases that had CHI data for 1<sup>st</sup> attempt and had noncontact outcome for 1<sup>st</sup> attempt

<sup>2</sup> Cases that had CHI data for 2<sup>nd</sup> attempt and had noncontact outcome for 1<sup>st</sup> and 2<sup>nd</sup> attempts

<sup>3</sup> Cases that had CHI data for 3<sup>rd</sup> attempt and had noncontact outcome for 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> attempts

**Figure 3: Strategies Used for Contacts Across Attempts**  
 1<sup>st</sup> Attempt N=21,813<sup>1</sup>, 2<sup>nd</sup> Attempt N=15,818<sup>2</sup>, 3<sup>rd</sup> Attempt N=10,013<sup>3</sup>

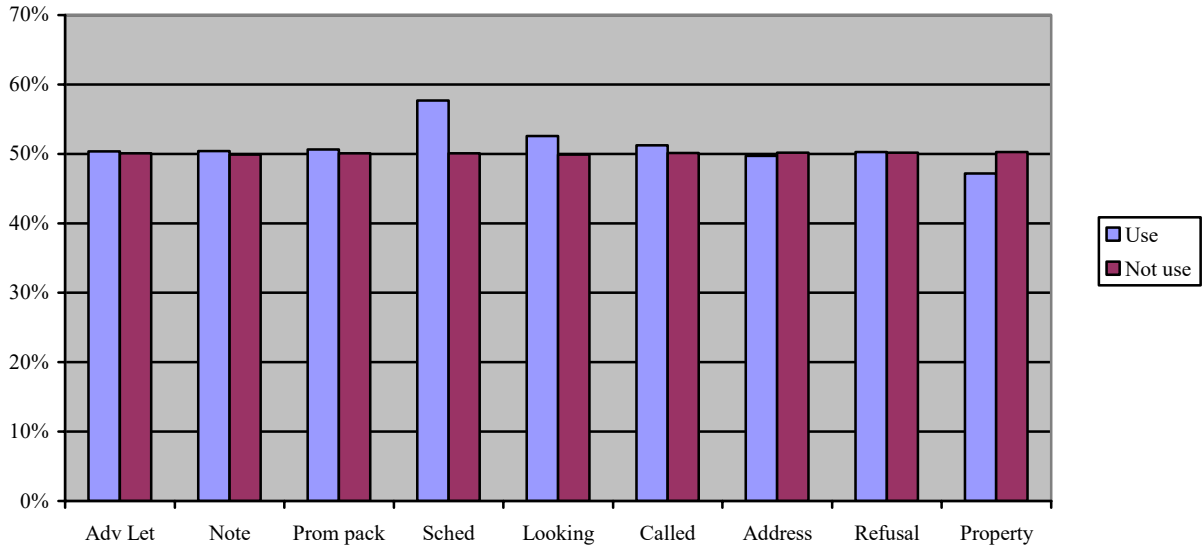


<sup>1</sup> Cases that had CHI data for 1<sup>st</sup> attempt and had contact outcome for 1<sup>st</sup> attempt

<sup>2</sup> Cases that had CHI data for 2<sup>nd</sup> attempt and had contact outcome for 1<sup>st</sup> and 2<sup>nd</sup> attempts

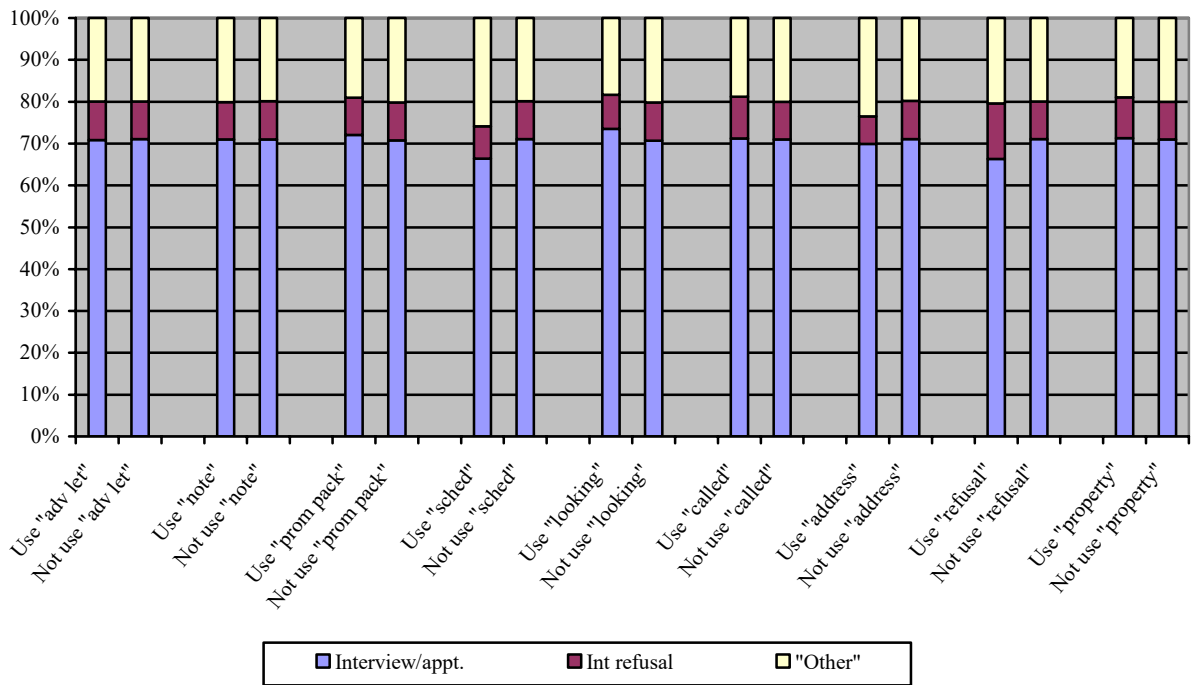
<sup>3</sup> Cases that had CHI data for 3<sup>rd</sup> attempt and had contact outcome for 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> attempts

**Figure 4. Second Attempt Contact Rates for First Attempt Noncontacts by Strategies Used on First Attempt (n=18,162)<sup>1</sup>**



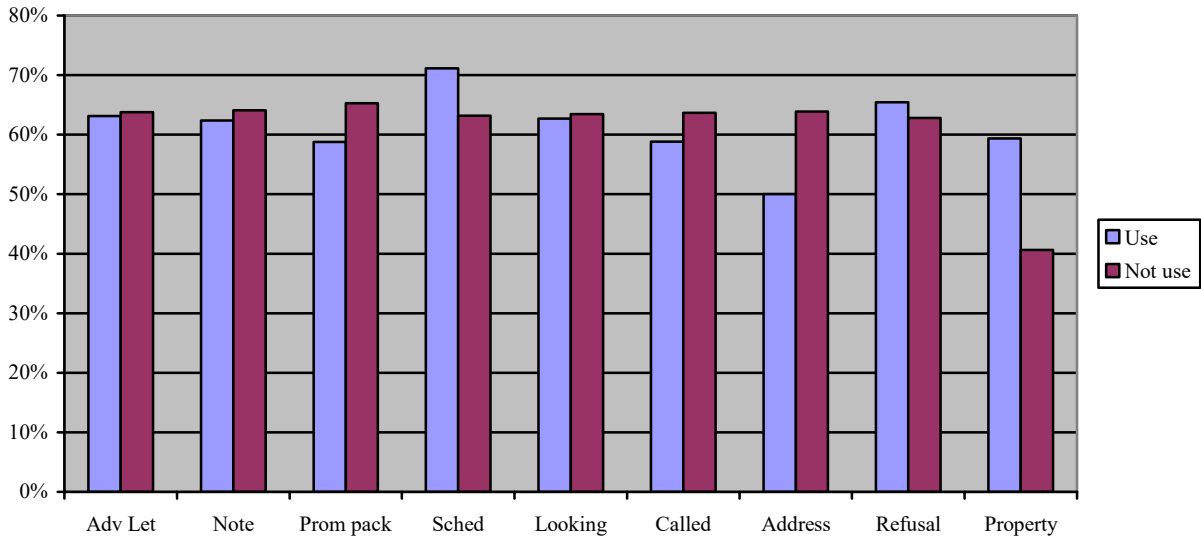
<sup>1</sup> Cases with noncontact outcome on first attempt

**Figure 5. Second Attempt Contact Outcomes for First Attempt Noncontact Cases, by Strategies Used on First Attempt (n=9,111)<sup>1</sup>**



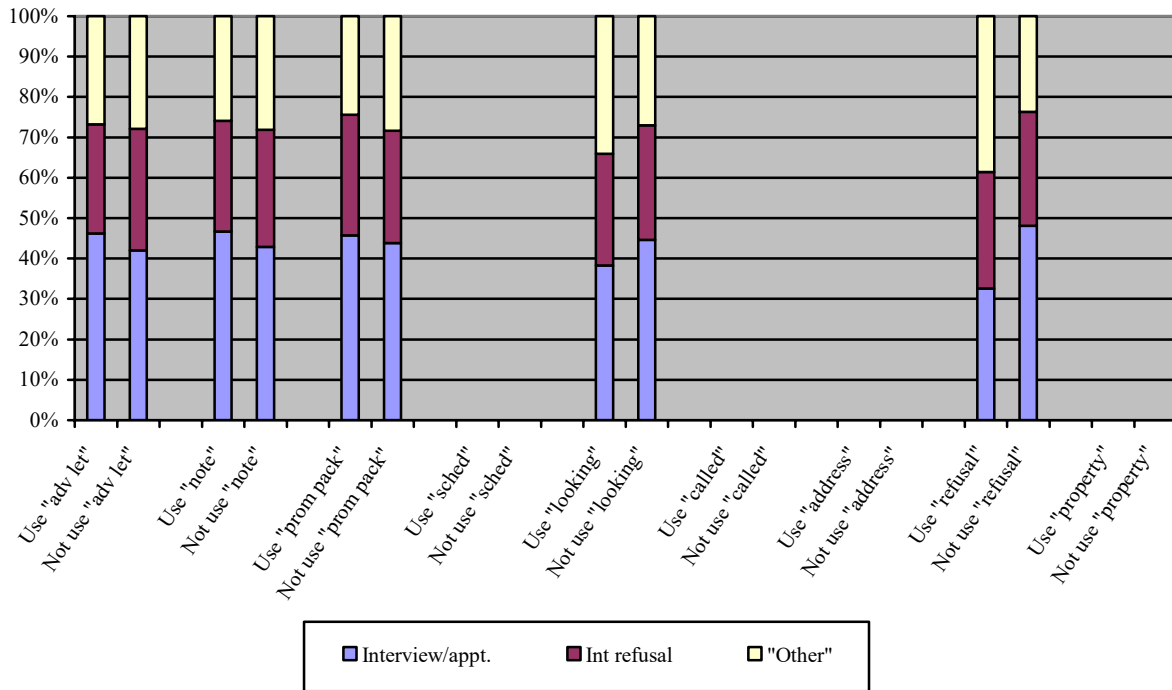
<sup>1</sup> Cases with noncontact outcome on first attempt and contact outcome on second attempt

**Figure 6. Second Attempt Contact Rates for First Attempt Interim Refusal Cases, by Strategies Used on First Attempt (n=1,733)<sup>1</sup>**



<sup>1</sup>Cases with interim refusal outcome on first attempt

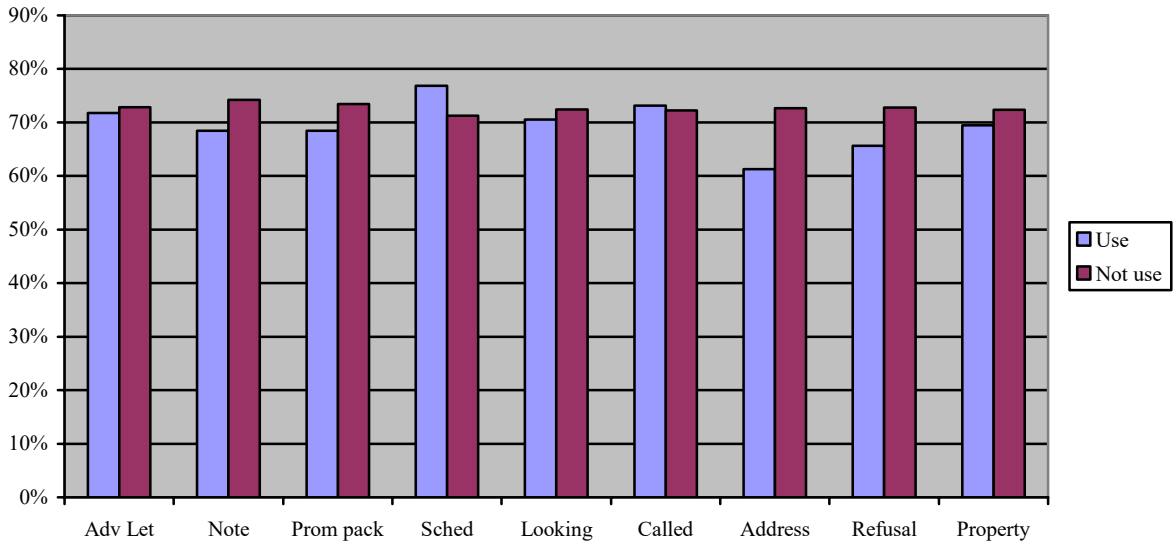
**Figure 7. Second Attempt Contact Outcomes for First Attempt Interim Refusal Cases, by strategies Used on First Attempt (n=1,099)<sup>1,2</sup>**



<sup>1</sup>Cases with interim refusal outcome on first attempt and contact outcome on second attempt

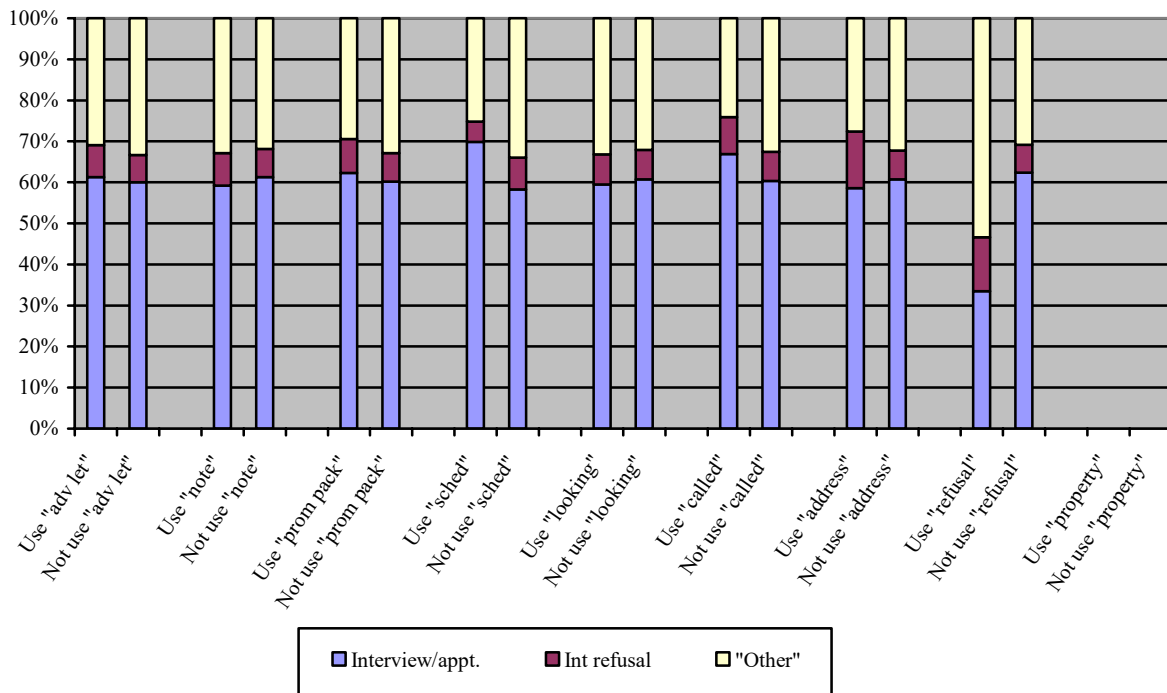
<sup>2</sup>Some strategies were excluded from the analysis due to small cell sizes

**Figure 8. Second Attempt Contact Rates for First Attempt "Other" Contact Cases, by Strategies Used on First Attempt (n=4,426)<sup>1</sup>**



<sup>1</sup> Cases with "other" contact outcome on first attempt

**Figure 9. Second Attempt Contact Outcomes for First Attempt "Other" Contact Cases, by Strategies Used on First Attempt (n=3,201)<sup>1,2</sup>**



<sup>1</sup> Cases with "other" contact outcome on first attempt and contact outcome on second attempt

<sup>2</sup> Some strategies were excluded from the analysis due to small cell sizes.