Obtaining administrative record linkage consent by mail: Examining the impact of incentives and telephone follow-up

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Abstract

With response rates declining over time (Groves, 2011), researchers are turning to administrative records as an alternate method for collecting rich and comprehensive data from study participants, while also reducing respondent burden and survey costs. Such linkage requests typically require obtaining consent from study participants for sensitive, personally identifiable information (PII) (Sakshaug et al., 2012). For this reason, these studies generally use interviewer-administered modes, where interviewers can build rapport and address respondents' concerns. Mail can be an attractive, cheaper mode. However, little is known about the feasibility of using a mail survey to make such linkage requests (Fulton, 2012).

This paper reports the findings from a study testing the feasibility of using a mail survey to obtain participants' authorization to release their Social Security Administration employment and benefits records for survey research. This paper demonstrates what to expect when considering a mail mode for obtaining record linkage consent and evaluates the effects of (1) different incentives and (2) telephone follow-up on respondents' willingness to provide linkage consent by mail. We found that incentives had a positive effect on linkage consent rates, although the magnitude of the effects was not linear across incentive conditions nor were the effects uniform for survey cooperation and linkage consent rates alike. Our cost-benefit simulation indicates that in this study, telephone follow-up was not a cost-effective approach for improving consent rates when the primary data collection mode is mail. Instead, offering a $20 prepaid incentive without telephone follow-up was the most cost-effective approach. However, even the approach with the highest overall consent rate (i.e., a $20 prepaid incentive and telephone follow-up) yielded a consent rate of about 25 percent compared to a consent rate of about 40 percent for the Health and Retirement Study, where a very similar request is made in person.

Key Words: Sensitive requests; Administrative records; Longitudinal study; Mail surveys; Linkage consent rates

1. Introduction

Administrative records provide survey researchers with a supplemental method for collecting rich and comprehensive data from study participants, while also reducing

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respondent burden (Sakshaug, Weir, & Nicholas, 2010). Many national surveys—including the National Health Interview Survey (NHIS), the Survey of Income and Program Participation (SIPP), and the Health and Retirement Study (HRS)—request respondent permission to access and link administrative data with survey responses (Fulton & Tourangeau, 2011). Using administrative data instead of self-reports can be a more reliable approach to collecting data on topics such as income, employment, and medical history, where respondents may not know or be able to recall the requested information in detail. Administrative data can also be used to validate survey data when measurement bias is suspected, replace missing survey data, provide access to or enhance longitudinal data, and answer research questions that could not be answered with only one type of data (Calderwood & Lessof, 2009; Fulton & Tourangeau, 2011). Administrative data on earnings, employers, and SSA benefits are recorded and stored by the Internal Revenue Service (IRS) and shared with the Social Security Administration (SSA). Federal surveys such as SIPP have in turn linked to SSA-provided records. HRS is the first survey that is not part of the federal infrastructure to craft agreements with SSA for consent-based record linkage and has been doing so since it began in 1992.

In many instances, accessing and linking administrative data from federal agencies (e.g., SSA data) to survey participants requires obtaining participants' consent, and consenters are often asked to provide sensitive, personally identifiable information (PII) such as their Social Security number (SSN) (Sakshaug et al., 2012). Not all respondents are willing to share their PII. For this reason, most studies generally use interviewer-administered modes, where interviewers can build rapport and address respondents' concerns when asking for their record linkage consent. HRS has also found that consent rates for in-person interviews are higher than for telephone interviews, mainly because the consent can be collected at the time of interview. Mail offers the prospect of much lower costs for collecting consent information from large samples. However, little is known about the success rate of using a mail survey to make such linkage requests and collect the required PII (Fulton, 2012).

This paper reports the findings from two experiments embedded in a study testing the feasibility of using a mail survey to obtain participants' authorization to release their SSA records for survey research. In 2011 and 2012, the American Institutes for Research (AIR) partnered with researchers from the University of Michigan's HRS on a pilot study of Americans ages 65–70. The HRS research team was particularly interested in exploring alternative approaches for contacting this sample—whose members are of similar age to cohorts of HRS respondents—and for obtaining consent to link to SSA earnings and benefits data.

1.1 Background

1.1.1 Methods for obtaining linkage consent

Consent to provide PII can be given orally, in writing, or through an opt-out approach. Written consent usually consists of obtaining a respondent's signature and some form of PII, such as SSN, that can be used to locate and link to the respondent's administrative data. This is the approach required by the SSA and therefore investigated in the present study.

1.1.2 Sensitivity of the data to be obtained

Administrative records could be health records such as Medicare or Medicaid claims data, medical records, or employment records from the SSA. Some administrative records may be perceived as more sensitive than others. In a telephone survey on public attitudes toward data sharing by the federal statistical system, respondents were asked to rate how personal they thought different types of records were on a 4-point scale ranging from "not at all personal" to "extremely personal" (Fulton, 2012). On average, respondents rated medical records as the most sensitive and employment history records as the least sensitive. These results suggest that employment history records may be viewed as less sensitive than other types of records. However, it is not known whether respondents in this study were provided with the information about how the employment records would be obtained (e.g., through the SSA), which could have an impact on the perceived sensitivity of the request.

1.1.3 Sensitivity of the information needed to obtain linkage consent

Record linkage can be done with different types of personal, government-issued identifiers including SSN, Medicare number, and Medicaid number. The perceived sensitivity of the linkage request may vary by the type of information being sought as well as by who is collecting the information. In the study described in the previous section, respondents were also asked to rate the sensitivity of different types of identifying information (Fulton, 2012). On average, respondents perceived the 9-digit SSN as the most personal identifier.

There are a number of methods for reducing the perceived sensitivity of a request for personal identifiers. For example, in 2007, NHIS started requesting only the last four digits of respondents' SSN (and Medicare number), and those who refused were asked for permission to link using their name and date of birth (Miller, Gindi, & Parker, 2011). In a meta-analysis of studies requesting administrative record linkage, Fulton (2012) found support for her hypothesis that average consent rates for studies collecting 4-digit SSNs were higher than those for studies collecting 9-digit SSNs (76% vs. 68%); however, the sample size for the meta-analysis was very small and the difference was not significant. Transitioning from a direct SSN request in the Current Population Survey (CPS) and SIPP to an opt-out approach is what the Census Bureau did because of declining consent rates (Fulton, 2012). However, there are a number of restrictions on which organizations can utilize these less sensitive methods; as a result, not all studies can apply such methods. For example, SSA can provide exemptions to federal statistical agencies such as the National Center for Health Statistics or the U.S. Census Bureau so they do not have to request the full 9-digit SSN, but cannot do so for agencies or organizations outside the federal government, such as the University of Michigan, which collects these data for the HRS.

1.1.4 Impact of data collection mode on linkage consent

Most studies that obtain consent to record linkage use interviewer-administered modes. Fulton (2012) found that mean consent rates were higher for surveys conducted in person (75%) than for those conducted by telephone (63%) or mail (49%); although both differences were meaningful, only the difference in consent rates between the in-person and mail modes was statistically significant at the p=.05 level. However, interviewer-administered surveys are the most expensive data collection method and thus not always feasible. Mail is an attractive, cheaper alternative mode; however, not many studies have used this mode (Fulton, 2012). We identified four mail surveys that have requested

consent to record linkage with some success: McCarthy et al. (1999), Murdoch, Pietila, & Partin (2010), Ziegenfuss et al. (2012), and Partin et al. (2008). However, each of these studies used relatively small samples with specific target populations—patients with post-traumatic stress disorder (PTSD) (Murdoch, Pietila, & Partin, 2010), patients with colorectal cancer (Partin et al., 2008), health plan members (McCarthy et al., 1999), and patients treated for ulcerative colitis (Ziegenfuss et al., 2012)—and all were conducted in specific parts of Minnesota, and as a result may not be representative of the general population.

Our review found only one mail study that collected a personal identifier as part of the linkage request (Murdoch, Pietila, & Partin, 2010). In this study, 1,099 veterans treated for PTSD were randomly assigned to one of three consent groups: (1) Health Insurance Portability and Accountability Act (HIPAA) authorization form embedded in the survey (checking ''yes'' for consent); (2) HIPAA form requiring signature for consent sent after the survey; or (3) HIPAA form requiring a signature and SSN for consent sent after the survey. The authors found that the ''embedded'' strategy (group 1) yielded the highest authorization rate (59.1%), while requiring respondents' signatures and SSNs after the survey was returned (group 3) generated the lowest authorization rate (48.7%); however, the difference was not statistically significant.

1.1.5 Incentives and linkage consent

Several other factors can impact a respondent's willingness to provide linkage consent. Experimental research suggests that, in general, prepaid incentives have positive effects on mail survey response rates (Church, 1993; Singer & Kulka, 2002; Cantor, O'Hare, & O'Connor, 2008; Singer & Ye, 2013), but very little research examines the effect of prepaid incentives on linkage consent rates. What little research does exist indicates that incentives may have a positive effect of incentives on consent rates for certain types of records. In a telephone survey of 7,200 U.S. adults, 40 percent of the sample members were randomly assigned to receive a $5 prepaid incentive with the advance letter, while the other 60 percent of the sample did not receive an incentive (Medway, 2012). Half of the sample members in each experimental group were asked if they would give consent for the researcher to access their health records, while the other half were asked if they would provide consent to access their income and employment records. Of the 900 individuals who responded to the survey, those assigned to the incentive group were more likely than those in the control group to give consent to access their health records (38% and 28%, respectively; p=.04), but there was no difference in the incentive and no-incentive groups for the income and employment records request (27% and 26%, respectively; p=.74) (Medway, 2012). We are not aware of any other published research that includes this kind of an incentive experiment in a mail study.

1.1.6 Nonresponse follow-up and response rates in mail studies

Nonresponse follow-up is often used as a method to increase response rates. Research suggests using a different mode of contact for the nonresponse follow-up than previous contact modes as a way to increase response rates (de Leeuw, 2005; Dillman, Smyth, & Christian, 2009). Telephone follow-up to a mail survey is a common design. The telephone follow-up can consist of a reminder to complete the mail survey, or the survey can be completed over the telephone. The benefit of telephone reminders may be found in terms of cost savings when considering the cost per completed survey. One study found that a telephone reminder reduced the cost per completed survey by 15 percent when compared to no reminder telephone call, and it significantly increased the response rate (Silva, Smith, & Bammer, 2002).

Our study contributes to the limited methodological research focusing on the feasibility of using a mail mode to obtain record linkage consent in several ways. This paper seeks to answer three research questions:

(1) Do incentives significantly improve linkage consent rates in a mail-based study where both the data to be obtained and the PII needed for linkage consent are considered to be sensitive?
(2) To what extent does prompting by telephone improve consent rates?
(3) Which combination of methods (e.g., incentives and telephone follow-up) is the most cost effective for obtaining linkage consent by mail?

This study examines the effectiveness of these methods in a national sample of older Americans. Results from this study will be particularly useful for other studies of aging U.S. populations seeking cost-effective methods for supplementing their survey data with administrative record data, such as HRS, Midlife Development in the United States (MIDUS), and the Wisconsin Longitudinal Study (WLS). Furthermore, individuals sampled for this study had not been contacted in 37 to 51 years. In this way, the present study provides a baseline for how effective such methods can be where there is little or no recent contact with the sample members.

2. Study Design and Methods

2.1 Sample and Data Source

This study uses data collected as part of the 2011–12 Project Talent Follow-up Pilot Study (PTPS12), a pilot study designed to assess the feasibility of finding and reengaging a representative random subsample of 4,879 Project Talent participants who had not been contacted in 37 to 51 years. One of the primary goals of PTPS12 was to help HRS learn more about the effectiveness of alternative approaches to obtaining consent for administrative linkages to SSA records—specifically to contact Project Talent participants by mail to request linkage consent. This work was supported through research funds provided by AIR and through supplemental grants provided to HRS by the National Institutes of Health's National Institute on Aging [P30 AG012846-17S1 and U01 AG009740-21S2].

Project Talent is a longitudinal study of a nationally representative sample of high school students in 1960 who had not been surveyed since 1974. In 1960, sampled students in grades 9–12 across the United States completed a 2-day battery of aptitude and ability tests, a personality assessment, and informational questionnaires. The instruments collected considerable information on their family background, aptitudes, abilities, interests, personalities, educational experiences, activities, and post-high school plans. Follow-up surveys were sent to participants by mail 1, 5, and 11 years after sample members' expected date of high school graduation. The original data collection plan also called for a 20-year follow-up to be conducted in 1980. However, the study was put on hold in the late 1970s due to concerns about the difficulty and cost of locating and contacting sample members for future follow-ups. For more information on Project Talent, including the ability and personality assessments, see Flanagan et al. (1962), Wise, McLaughlin, & Steel (1979), or www.projecttalent.org.

A subsample of 4,879 participants was randomly selected from a 10 percent random subsample of the original 1960 schools to participate in the pilot study. PTPS12 sample members were between 67 and 70 years old when data collection activities began.

2.2 Pilot Study Design

In 2011, researchers with the American Institutes for Research (AIR), the University of Michigan's Survey Research Center (SRC), and the University of Michigan's HRS designed a large-scale pilot test to assess the feasibility of locating and persuading participants of the original 1960 study to participate in a follow-up some 50 years after the initial base-year survey. The pilot study used a mail survey mode with two-stage sampling to select approximately 1 percent of the original Project Talent participants. Study participants were selected from a 10 percent random subsample of Project Talent schools. A subsample of 4,159 participants from the selected schools were randomly assigned to receive a paper questionnaire and an additional request for permission to link to their SSA data ("SSA" sample; *n*=4,159). Though not included as part of this analysis, the pilot study also included a supplemental sample of 720 participants from the same subsample of schools who were selected to receive only the questionnaire request to test the effect of the SSA request on survey response rates.

PTPS12 was conducted in three sequential phases: one tracking phase and two data collection phases—an initial mail survey (Phase 1) followed by a telephone follow-up of a subsample of mail survey nonrespondents (Phase 2). During the tracking phase, information available in the Project Talent historical records was used to collect recent telephone numbers, addresses, and vital status information on every sample member. The project team identified 14.7 percent of the sample members as deceased and found updated address information for 70.5 percent. Survey materials were mailed to all presumed surviving cases for which an address was found (*n*=2,922). Additional tracking efforts specifically aimed at identifying ineligible (deceased) cases were carried out during the data collection fielding period and identified 36 of the 2,922 cases included in the initial mail contact sample as deceased, either through these additional tracking methods or by informants during the fielding period; another 49 cases were identified as false tracking leads or noncontacts due to outdated address information.

Phase 1 followed the Total Design Method (TDM) (Dillman, 1978), which has been shown to be successful for securing high response rates in mail studies. Participants were first mailed an advance letter announcing the project. Survey packets were then mailed and were followed one week later by a thank-you/reminder card. Follow-up survey packets were sent to all individuals who had not returned their survey within 5 weeks. In Phase 2 of the study, individuals who did not respond to the survey or subsequent reminder letters and who were not coded as lost or ineligible (i.e., deceased or unable to respond due to a permanent condition) were contacted by telephone by trained survey interviewers. The interviewers first attempted to verify the participants' addresses using interactive tracking databases and then attempted to contact the nonrespondents by telephone and encourage them to complete and return the questionnaire and SSA consent forms.

2.2.1 Experimental Design and Assignment to Treatment Conditions

The research team was interested in exploring alternative approaches for contacting this sample—whose members are of similar age to cohorts of HRS respondents—and for obtaining consent to link to SSA records by mail. Experiments embedded in PTPS12 were used to inform the costs and benefits of using such approaches.

Experiment 1: Incentives. We were interested in comparing the effects of offering no incentive ($0), the novelty of a $2 bill, and a $20 'thank-you for your time' check on survey cooperation and SSA linkage consent in this population. Sampled persons were randomly assigned to one of these three experimental incentive conditions to test the effects of different incentives on response propensity. One benefit of using a check for the highest incentive is that the incentive costs are incurred only if the check is cashed. All prepaid incentives were included in the initial packet mailing. We hypothesized that relative to offering no incentive, a $2 incentive would yield significantly higher survey cooperation and linkage consent rates, and that a $20 incentive would be significantly more effective at improving both rates. We expected that the prepaid incentives would have roughly the same effect in terms of percent increase on survey cooperation and linkage consent rates alike. For example, if a $2 bill incentive yielded a 50 percent increase in survey cooperation rates relative to the $0 group, it would also yield a 50 percent increase in linkage consent rates.

Experiment 2: Telephone follow-up. For the SSA sample, the design included the selection of a subsample of Phase 1 nonrespondents such that 50 percent of the cases were randomly selected to receive follow-up contacts and 50 percent were retained as comparison cases to allow for evaluations and corrections of nonresponse biases. The random assignment of these cases to treatment and control groups took place approximately 2 weeks after the follow-up packets were sent. We hypothesized that the telephone follow-up would significantly improve questionnaire response and linkage consent rates, and expected that the percent increase from treatment to control would be similar for the response and consent rates alike.

2.2.2 Design of SSA Consent Materials

Survey packets contained a cover letter signed by the study directors, project brochure, Frequently Asked Questions flyer, and 28-page questionnaire booklet, as well as SSA consent materials. SSA has strict requirements for the design of consent materials. The SSA forms were bound into an eight-page booklet which looked exactly like the SSA form booklet used by HRS. The booklet included a consent page and two consent forms—one to obtain consent for the release of SSA benefits data and another for SSA earnings and employers' data. The consent page explained the nature of the request, the information being sought, to whom the information would be released, and other elements of consent. Each consent form included a request for a first, middle, last, and maiden name (where applicable), as well as a complete date of birth, SSN, signature, and signature date. SSA requires that each form be completed in full, signed, and dated without errors or omissions. The SSA consent form had its own cover letter explaining the process and an envelope for returning the materials for processing. A letter of endorsement from SSA's Associate Commissioner was also included. A series of personalized follow-up letters were developed specifically to address common SSA consent form issues encountered by HRS (e.g., missing data such as signature, date, or nine-digit SSN; completion error such as date of birth entered in "today's date" field; or a missing form where the respondent returned only one of the two forms).

2.3 Analysis

This paper reports the findings of the incentive experiments in Phase 1 and the nonresponse follow-up experiment in Phase 2 on linkage consent rates. Two measures are evaluated: (1) unconditional consent rates—that is, the proportion of all eligible, contacted sample members who gave linkage consent—and (2) conditional consent rates,

which reflect the proportion of survey respondents who gave linkage consent. In addition, cost-per-consent estimates are used to evaluate the practical implications across each of the experimental design elements. Unless otherwise noted, the analytic sample for this paper is composed of the all eligible, fielded cases (*n*=2,886).

3. Results

3.1 Results Overview

Table 1 summarizes the results of the SSA consent request for all eligible (not deceased) cases. The table presents the unweighted SSA consent rates, which are defined as the total number of fielded, eligible cases completing and returning at least one SSA consent form. The overall unweighted linkage consent rate for the PTPS12 is 17.4 percent. In all, 39.7 percent of those who completed and returned a survey also provided SSA linkage consent, while 59.4 percent refused the SSA linkage consent request. A small number (*n*=15) returned forms that could not be processed because the form contained an error or was missing a key element. In the sections that follow, these cases are treated as nonconsenters. The research questions are examined in the sections that follow.

Table 1. Number and percentage of cases providing SSA linkage consent

	Number of eligible cases[1]	Percent of all eligible cases	Number of eligible, fielded cases	Overall SSA cooperation rate[2]	Conditional SSA consent rate[3]
SSA linkage consent provided	612	17.4	612	21.2	39.7
Two forms returned	586	16.7	586	20.3	38.0
One form returned	26	0.7	26	0.9	1.7
Earnings and employers only	16	0.5	16	0.6	1.0
Benefits only	10	0.3	10	0.3	0.6
SSA form(s) returned with error, unable to process	15	0.4	15	0.5	1.0
SSA refusal	1,191	33.9	1,189	41.2	59.4
Study refusal	275	7.8	273	9.5	†
SSA active refusal, survey complete	160	4.6	160	5.5	10.4
SSA passive refusal, survey complete	756	21.5	756	26.2	49.0
Not located and/or fielded	625	17.8	†	†	†
Other study noninterview (e.g., incapacitated, out of country or institutionalized)	1,071	30.5	1,070	37.1	†
TOTAL	3,514	100.0	2,886	100.0	100.0

Note: A case was classified as an active SSA refusal if the SSA forms were returned blank or where the respondent actively refused to the SSA request. A case was classified as a passive SSA refusal if the survey was returned, but the SSA forms were never returned.

† Not applicable.

[1] Includes all those who were sampled minus those who died prior to the start of data collection.

[2] The overall SSA cooperation rates were calculated using the American Association for Public Opinion Research's Cooperation Rate 3, such that the denominator includes the number contacted minus those identified as deceased, incapacitated, or lost (i.e., wrong person, wrong address).

[3] The conditional consent rate is the percentage of survey completers who provided SSA linkage consent.

Source: PTPS12 paradata (v1) file.

3.2 Research Question 1: Do incentives significantly improve linkage consent rates in a mail-based study where both the data to be obtained and the PII needed for linkage consent are considered to be sensitive?

Table 2 presents the unweighted results of the incentive experiment; the results presented in this table reflect the overall outcomes and do not account for the nonresponse follow-

up experiment in Phase 2. The linkage consent rates were consistently lower for the $2 bill group and consistently higher for the $20 check group. The unconditional linkage consent rates were higher by almost 6 percentage points for the $20 check group (25.0%) compared to both the $0 and $2 bill, where the rates were nearly identical (19.2% and 19.3%, respectively). The differences were statistically significant at the p=.05 level. The conditional linkage consent rates were highest for the $20 group (42.9%) and lowest for the $2 bill group (36.1%). The difference between the conditional consent rates was statistically significant for the $20 and $2 groups ($p$=.02), but there were no other statistically significant differences between the experimental incentive groups.

Table 2. Survey cooperation and SSA linkage consent rates, by experimental prepaid incentive condition

Experimental prepaid incentive group	Number of eligible, fielded cases	Unconditional SSA linkage consent rate		Number of survey completes	Conditional SSA linkage consent rate	
		Percent	95% confidence interval		Percent	95% confidence interval
$0	958	19.2	(16.7, 21.7)	465	39.6	(35.1, 44.0)
$2 bill	951	19.3	(16.8, 21.9)	509	36.1	(32.0, 40.3)
$20 check	977	25.0***	(22.3, 27.7)	569	42.9**	(38.8, 47.0)
Total	2,886	21.2	(19.7, 22.7)	1,543	39.7	(37.2, 42.1)

Note: The $2 bill group is the reference group for all statistical tests shown. The results presented in this table reflect the overall outcomes and do not account for the nonresponse follow-up experiment in Phase 2
*** $p < .01$, ** $p < .05$, * $p < .10$.
Source: PTPS12 paradata (v1) file.

3.3 Research Question 2: To what extent does prompting by telephone improve consent rates?

To assess the impact of the nonresponse follow-up, the Phase 2 cooperation rates for the treatment group (those receiving the telephone follow-up) were compared to the corresponding rates for the control group, whose completed surveys were returned by respondents with no additional prompting after the Phase 1 cut-off period. Before looking at the consent rates, we wanted to gain an understanding of how the nonresponse follow-up impacted survey cooperation rates. As Table 3 shows, across all incentive groups, the nonresponse treatment yielded increases of 79 to 112 percent in survey cooperation rates; all increases were significant at the p=.05 level. Telephone follow-up was most effective in the no-incentive group, where the Phase 1 survey cooperation rates were lowest (not shown in tables); the nonresponse follow-up treatment yielded an increase of 19.8 percentage points in the survey cooperation rate. The follow-up also appeared to have been more effective in the $20 check group than in the $2 bill group.

The impact of telephone follow-up was less effective on SSA consent rates, and contrary to our expectations, the nonresponse follow-up was not uniformly effective for survey cooperation and consent rates alike. The effects of the telephone follow-up on linkage consent rates were most dramatic for those who received the $2 bill incentive in Phase 1, where differences in the unconditional linkage cooperation rate were significantly higher for the treatment group than for the control group. While the nonresponse follow-up treatment yielded a 79 percent increase in survey cooperation rates within this incentive group, it yielded a 155 percent increase in unconditional linkage consent rates.

The pattern was reversed for the $0 and $20 check incentive groups. Although the differences in unconditional consent rates for the follow-up treatment and control groups were not statistically significant within these incentive groups, the differences are still meaningful. Within the $0 group, the nonresponse follow-up treatment yielded an

increase of 112 percent in survey cooperation rates and a 33 percent increase in unconditional linkage consent rates. In the $20 check group, the nonresponse follow-up treatment yielded an increase of 87 percent in survey cooperation rates and an increase of 63 percent in the unconditional linkage consent rates.

The same pattern is reflected in the conditional linkage consent rates, where a smaller percentage of the survey completers in the $0 and $20 incentive groups who were assigned to the follow-up treatment group provided SSA linkage consent relative to the survey completers assigned to receive no additional follow-up in Phase 2. This likely reflects a selection bias, such that those who returned their surveys late (i.e., in Phase 2) with no prompting are generally more cooperative relative to those assigned to the treatment group, where nearly half of the Phase 2 survey completers returned their surveys only after receiving telephone prompting. Put another way, the telephone prompting may have been effective at encouraging less cooperative respondents assigned to the $0 and $20 incentive groups to complete their surveys, but may have been less effective at encouraging them to also return their linkage consent forms. However, this trend was reversed for those assigned to the $2 incentive group. This could suggest that the phone follow-up was less effective at encouraging those assigned to the $2 incentive group to complete and return their surveys, meaning that in this instance those who did return their surveys after phone prompting may generally be more cooperative. As a result of such a selection bias, these survey respondents may have been more amenable to providing linkage consent.

Table 3. Survey cooperation and SSA consent rates, by experimental telephone follow-up group in Phase 2—Overall and by Phase 1 experimental prepaid incentive group

Survey cooperation and SSA consent rates, overall and by Phase 1 experimental prepaid incentive group	Nonresponse follow-up (Phase 2): Control			Nonresponse follow-up (Phase 2): Treatment			Percent increase (Treatment / Control)
	Eligible (*n*)	Rate	95% confidence interval	Eligible (*n*)	Rate	95% confidence Interval	
Survey cooperation rate	**770**	**18.6**	**(15.8, 21.3)**	**762**	**36.0*****	**(32.5, 39.4)**	**93.5**
$0	299	17.7	(13.4, 22.1)	293	37.5***	(32.0, 43.1)	111.9
$2 bill	255	19.2	(14.4, 24.1)	253	34.4***	(28.5, 40.2)	79.2
$20 check	216	19.0	(13.7, 24.2)	216	35.6***	(29.3, 42.0)	87.4
Unconditional linkage consent rate	**770**	**6.0**	**(4.3, 7.6)**	**762**	**10.6*****	**(8.4, 12.8)**	**76.7**
$0	299	6.4	(3.6, 9.1)	293	8.5	(5.3, 11.7)	32.8
$2 bill	255	5.1	(2.4, 7.8)	253	13.0***	(8.9, 17.2)	154.9
$20 check	216	6.5	(3.2, 9.8)	216	10.6	(6.5, 14.8)	63.1
Conditional linkage consent rate	**143**	**32.2**	**(24.5, 39.9)**	**274**	**29.6**	**(24.1, 35.0)**	**-8.1**
$0	53	35.8	(22.9, 48.8)	110	22.7*	(14.9, 30.6)	-36.6
$2 bill	49	26.5	(14.1, 38.9)	87	37.9	(27.7, 48.2)	43.0
$20 check	41	32.2	(24.5, 39.9)	77	29.6	(24.1, 35.0)	-8.1

Notes: The nonresponse follow-up control group is the reference group for all statistical tests shown.
*** $p < .01$, ** $p < .05$, * $p < .10$.
Source: PTPS12 paradata (v1) file.

3.4 Research Question 3: Which combination of methods is the most cost effective for obtaining linkage consent by mail?

Incentives not only yield higher levels of response, they can also encourage recipients to respond more quickly, which can help to reduce overall survey costs. To evaluate the cost

effectiveness of the experimental methods used in PTPS12, we used a number of fixed assumptions in combination with actual results to estimate data collection costs. Specifically, we concentrated on using the proportion of cases that were not completed in Phase 1 of the study and were therefore eligible for nonresponse follow-up in Phase 2 to estimate the costs. This figure is shown in Table 4, row (b). As the table shows, the proportion of cases needing follow-up in Phase 2 of PTPS12 varied as a function of the prepaid incentive provided in Phase 1. However, at the time that this analyses was conducted we were unable to take into account the proportion of cases that required additional follow-up mailings in Phase 1 because they did not return their surveys promptly and may affect the Phase 1 cost differences by incentive group.

The rows showing the costs estimates are bolded and shaded in grey in Table 4. We took into account the costs associated with the incentives themselves (row (c)), with deploying the incentives (in labor hours per contacted case; row (d)), and with the cost savings associated with uncashed checks in the $20 check scenario (row (f)). For the purposes of this demonstration, we assumed that the costs associated with the other Phase 1 survey operations would be equal across all incentive scenarios and therefore did not account for them in Table 4. Using an average hourly rate of $15.00 per hour for field staff responsible for deploying the incentives in Phase 1, the $2 bill condition will cost an additional $3,500 in Phase 1 and the $20 check condition will cost an additional $21,710 (row g). However, as rows (i) and (j) show, the additional costs associated with the incentives are offset in Phase 2 because using incentives in Phase 1 reduces the proportion of cases that will require higher cost follow-up in Phase 2. As a result, the total estimated costs for the $2 bill group are slightly lower than the total costs for the $0 incentive group ($16,575 for the $0 group compared to $14,500 for the $2 bill group). Using these assumptions, the total estimated costs for the $20 check group are estimated to be nearly double those of the $0 and $2 bill groups ($34,085). However, as rows (k) and (l) show, the survey cooperation and linkage consent rates were also higher when incentives were offered. Taking this into account, the costs-per-complete and costs-per-consent (rows (m) and (n) are lowest in the $2 bill scenario ($33.64/complete; $93.26/consent) and highest in the $20 bill scenario ($58.57/complete; $136.34/consent).

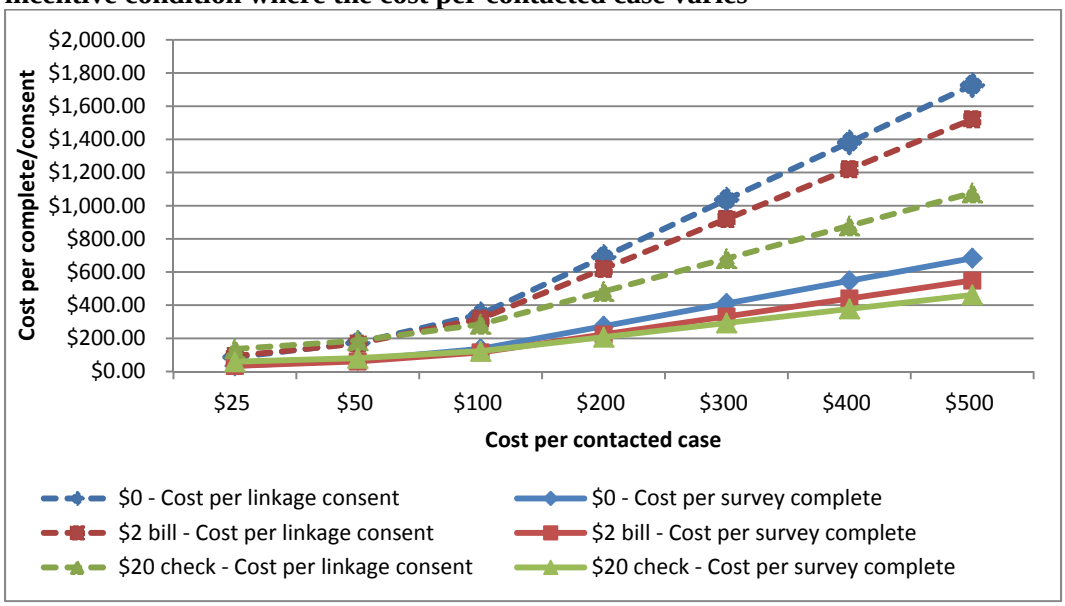
Table 4. Cost calculations, by experimental prepaid incentive condition

Calculations needed to compare costs	$0	$2 bill	$20 check
(a) Number of sample cases contacted	1,000	1,000	1,000
(b) Proportion of contacted cases not completed in Phase 1 and eligible for nonresponse follow-up in Phase 2 for PTPS12	66.3%	58.0%	49.5%
(c) Fixed cost of prepaid incentive per contacted case	$0	$2	$20
(d) Additional labor hours associated with deploying incentives in Phase 1 (per contacted case)	0.00 hours	0.10 hours	0.25 hours
(e) Average hourly rate for field operations staff	$15.00	$15.00	$15.00
(f) Cost savings from proportion of $20 checks not being redeemed/cashed for PTPS12	0.00%	0.00%	10.20%
(g) Estimated Phase 1 costs	**$0.00**	**$3,500.00**	**$21,710.00**
(h) Additional costs hours associated with following up with nonrespondents in Phase 2 (per contacted case)	$25.00	$25.00	$25.00
(i) Estimated Phase 2 costs	**$16,575.00**	**$14,500.00**	**$12,375.00**
(j) Total estimated costs (Phase 1 + Phase 2)	**$16,575.00**	**$18,000.00**	**$34,085.00**
(k) Survey response rate for PTPS12	48.5%	53.5%	58.2%
(l) Linkage consent rate for PTPS12	19.2%	19.3%	25.0%
(m) Total estimated costs-per-completed survey	**$34.18**	**$33.64**	**$58.57**
(n) Total estimated costs-per-linkage consent	**$86.33**	**$93.26**	**$136.34**

Because the costs-per-complete vary widely from study to study, we extended this demonstration one step further by allowing the additional costs-per-contacted case (row h) to vary. The exact increments used in this demonstration are shown on the *x* axis of Figure 1, while the estimated costs-per-consent/complete are shown on the *y* axis. We allowed each scenario to share the same assumption that the fictional study would require a total of 750 completed surveys and 250 linkage consents to meet its analytical goals. For each incentive condition (i.e., $0, $2 bill, and $20 check), the estimated costs are shown separately for completes and consents. Costs-per-completes are indicated using solid lines, while costs-per-consents are indicated using a dashed line.

The results of this demonstration suggest that offering no incentive may be more cost effective where interview and operational costs are very low (<$100 per contacted case), while offering a $20 prepaid check incentive is more cost effective once interview and operational costs exceed $100 per contacted case.

Figure 1. Costs per completed survey and linkage consent, by experimental prepaid incentive condition where the cost per contacted case varies



4. Discussion

The results of this paper demonstrate what to expect when considering practical, low-cost methods for obtaining record linkage consent. This pilot study tested the feasibility of using a mail mode, which does not have the benefits of an interviewer to build rapport and ease fears about providing linkage consent. Adding to this, the participants in this study had not been contacted for 37 to 51 years. The type of consent requested in PTPS12 was sensitive and required respondents to provide their 9-digit SSN, date of birth, name, and signature. Even under these less-than-ideal conditions, we found that some people are willing to provide consent. About 21 percent of those contacted for this study provided SSA linkage consent. This could be considered the lower bound of what to expect when requesting consent for record linkage by mail. Researchers may find that having rich, comprehensive administrative data linked to survey data at a relatively cheap overall cost outweighs the errors and biases associated with such a design.

Prepaid incentives were helpful and contributed to higher survey cooperation rates, and higher incentives were associated with higher consent rates. Among survey completers, those assigned to the $20 prepaid incentive group were 1.3 times more likely to provide SSA linkage consent than those assigned to the $2 incentive group. This could be attributable to the greater cash value of the $20 check, the legitimacy of receiving a check relative to receiving cash, or a combination of the two. There were no significant or meaningful differences in the consent rates between the $2 incentive group and the $0 group, which might suggest that that those who responded to the survey when no incentive was offered were among the most cooperative sample members and, therefore, also provided consent for SSA linkage at higher rates. In addition, while both the $2 and $20 incentives may have been more likely to compel reluctant sample members to provide survey responses, our findings suggest that the $2 cash incentive may not have been enough to compel participants to complete the SSA linkage consent forms as well.

Telephone follow-up yielded significant increases in survey cooperation and linkage consent rates; however, contrary to our expectations, the magnitude of the increases was greater for survey cooperation than for linkage consent. One explanation could be that when speaking with PTPS12 participants, telephone interviewers put less emphasis on returning the SSA consent forms than on returning a completed survey. In addition, the effect of telephone follow-up on conditional consent rates was inconsistent across incentive groups. The $0 incentive group had significantly higher conditional consent rates without telephone follow-up than with follow-up. Though this finding was inconsistent with our expectations, the $2 incentive group had higher conditional consent rates with follow-up, as expected. The differences across incentive groups could be attributable to selection biases, such that those who returned their surveys late (but with no additional prompting) are generally more cooperative than the survey completers who returned their surveys only after receiving additional prompting by phone. If true, we would expect survey completers in the no follow-up group to have higher scores on measures of cooperativeness than those assigned to the follow-up treatment group. Future studies will explore this theory by using measures of cooperativeness available from the base-year and follow-up surveys.

Our cost-benefit simulation indicates that in this study, telephone follow-up was not a cost-effective approach for improving consent rates when the primary data collection mode was mail. Instead, the $20 prepaid incentive without telephone follow-up seemed to be a more cost-effective approach. However, even our best approach (i.e., a $20 prepaid incentive and telephone follow-up) yielded a consent rate of about 25 percent. By comparison, when making a very similar request in person, 40 percent of HRS sample members provide linkage consent.

One limitation of this study is that the consent request was sent simultaneously with the survey instead of after survey completion, so the request could have affected survey response rates. The experiments discussed in this paper were part of a larger project, and future research will explore the additional experiments not discussed in this paper that test the effect of requesting sensitive information for linkage consent on the overall survey response rate. In addition, other record linkage studies have shown differences between consenters and nonconsenters on demographic as well as study outcome measures (Sakshaug et al., 2012). Future analyses of PTPS12 will focus on using longitudinal data to gain a better understanding of consent propensities and to evaluate nonresponse bias. We plan to test for such differences between consenters and

nonconsenters, examine the extent to which they differences may impact study outcomes, and explore statistical methods for reducing the bias in study estimates.

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