Determinates of Tracking Success After an Extended Hiatus: Results from the Project Talent Pilot Test

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Abstract
All longitudinal studies face a common challenge of locating study participants for future waves. Long lags between data collections can make tracking participants particularly difficult and costly. This paper provides results from the 2011–12 Project Talent Follow-up Pilot Study, a pilot test developed to assess the feasibility of finding and reengaging a representative random subsample of Project Talent participants who had not been contacted in 37 to 51 years. We examine the impact of key factors (e.g., availability of Social Security numbers, participation in previous waves, and availability of recently updated information) on tracking success and explore the effectiveness of two locating strategies: (1) batch searches of administrative data; and (2) interactive internet, database, and phone tracking of participants not located using method 1. We evaluate the extent to which interactive tracking was able to locate subpopulations that were not found using batch tracking methods and identify subpopulations that may continue to be disproportionately under-located. Qualitative assessments of the strategies are also examined.

Key Words: Tracking; Sample attrition; Locating; Project Talent; Longitudinal

1. Introduction

Longitudinal studies offer a unique opportunity to understand complex social phenomena and dynamic processes. Maintaining the integrity of the sample in a longitudinal study relies on first tracking a sample member and next on securing the sample member's participation, where the latter is absolutely conditional on the former. Long lags between data collection waves and limited panel maintenance between waves can make tracking participants particularly difficult and costly (see Couper and Ofstedal 2009; Duncan and Kalton 1987). The integrity of the study can be jeopardized when attrition, either through tracking failure or nonparticipation, is systematically related to the outcomes of interest.

While several studies note that high location and tracking rates are possible in longitudinal studies (e.g., Call et al. 1982; Hampson et al. 2001; Clarridge et al. 1978), the process of tracking every lost sample unit can take longer than expected and use more resources than the budget allows. Therefore, longitudinal studies are forced to carefully balance survey costs with errors. Most longitudinal studies rely on tiered approaches to respondent tracking that maximize success while minimizing costs by using the cheapest methods first to locate as many sample units as possible before turning to the more time-intensive and costly methods to track the hardest-to-find sample units.

For example, batch tracking refers to automated processes where tracking vendors use client-provided inputs and hard logic matching algorithms to identify potential matches across multiple databases and return current contact information for those matches. Because these services process numerous cases at one time, they provide researchers with relatively quick access to address confirmations or updates at the lowest per-case cost. In addition, batch processes significantly reduce the percentage of cases requiring some sort of manual tracking, thus lowering the overall cost of tracking efforts. Cases not located in batch tracking are then sent to interactive tracking, where a trained staff member in a centralized unit assesses each case on an individual basis and takes a variety of steps to locate the sampled member. Cases not located in the second tier are sometimes sent to field tracking, where an interviewer physically visits the last known address(es) to locate the hardest-to-reach sample members. Labor and travel costs make field tracking the most expensive of the methods.

The collection of key identifiers in the baseline data collection can greatly improve tracking rates and reduce costs. For example, having a participant's Social Security number (SSN) makes it easier to locate a person through less expensive methods, such as batch. Because an SSN is a unique identifier that rarely changes over the course of a person's life, it is particularly helpful for locating women, whose names may have changed. In addition, having an SSN reduces the likelihood of erroneously locating the wrong person (e.g., a different Mary Smith born in 1942). Date of birth is also an important identifier for tracking. As Couper and Ofstedal (2009) explain, these identifiers, along with other survey design factors—when and how much contact information is collected, the length of time between waves, and the level of panel maintenance between waves—have a significant impact on location propensity. However, the bulk of tracking activities use commercial vendors, which consolidate information from a variety of sources such as credit histories, voting records, property records, and voluntary registries (e.g., the National Change of Address Register). Thus, the likelihood of locating a person is also related to behaviors or characteristics of the individual that impact the extent to which that individual is "politically, socially, or economically engaged in their new community" (Couper and Ofstedal 2009, 187).

However, when key identifiers or other important contact information is collected in subsequent data collection periods, the likelihood of collecting key identifiers is directly related to response propensity, which can lead to biases in the sample estimates. In such studies, improving the representativeness of the sample must be carefully balanced with costs associated with locating and gaining the participation of hard-to-reach populations. For example, in such a study, the costs associated with relocating college-educated participants, who are both more likely to participate in follow-ups and more likely to have their lives accessible in public databases, are likely to be much lower than the costs associated with relocating participants with no more than a high school education. In this situation, it might make more sense to stratify the sample in a manner that will optimize both cost and representativeness.

This paper presents preliminary tracking results from a pilot study of 67- to 70-year-old participants who originally participated as high school students and have not been contacted in 37 to 51 years. We first examine the impact of key indicators (e.g., availability of SSNs, participation in previous waves, time between waves, and availability of recently updated information) on tracking success. Next, we use key base year measures to examine how harder to locate participants may differ from easier to locate participants in ways that could bias the follow-up survey estimates. Finally, we look more closely at which groups can be tracked more readily through less costly methods, and evaluate the extent to which additional resources may be needed to reduce the amount of nonresponse bias introduced at the tracking phase.

1.1 Sample

Project Talent is a nationally representative longitudinal study of men and women who were in high school in 1960. Conducted by the American Institutes for Research (AIR), Project Talent collected extensive information on the characteristics and cognitive abilities of approximately 440,000 high school students in 1960. The study began in the spring of 1960 when a 5 percent sample of 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. Aptitude and ability tests included measures of language and mathematics, interests, reasoning ability, and educational aspirations. Embedded in the tests, was a 150-item section called the "Student Activities Inventory," which could be used to understand how personality differences help to account for the differences in accomplishments of people who are otherwise equal with respect to their cognitive ability. Students were also asked to complete a 394-item questionnaire that collected information about student and family characteristics, health, activities in- and outside school, plans for college, military service, career, and family.

Subsequent to the Project Talent base-year data collection, follow-up studies collected data on students' educational, career, and personal experiences through approximately age 30. Students were asked about their postsecondary education, work experiences, personal life, future plans, aspirations, and quality of life in follow-up surveys mailed 1, 5, and 11 years after the expected high school graduation date of their 1960 grade cohort (see exhibit 1). In each follow-up, a special sample of nonrespondents was selected for intensive follow-up. For more information on Project Talent, including the ability and personality assessments, see Flanagan et al. (1962), Wise et al. (1979), or www.projecttalent.org. The original data collection plan also called for a 20-year follow-up. However, the study was put on hiatus in the early 1980s due to concerns about the difficulty and cost of contacting participants for future follow-ups.

The year 2010 marked the 50th anniversary of the baseline data collection and brought renewed interest in the study as a resource for understanding issues related to aging and the life course. In 2009, AIR began evaluating whether sample members could be relocated and the best methods for finding sample members who, in 2010, ranged in age from 66 to 69 years old (see exhibit 1). In 2011, with funding from the National Institute on Aging (P30 AG012846-17S1), AIR partnered with researchers from the University of Michigan's Survey Research Center (SRC) on a pilot study to assess the feasibility of finding and reengaging a representative random subsample of Project Talent participants who had not been contacted since the early 1970s.

1.2 Motivation

As noted previously, SSNs and dates of birth are enormously helpful for locating participants and for ensuring that the correct participant is located. In addition, having more recent name and contact information greatly improves the likelihood of tracking success. Project Talent collected dates of birth for nearly every person who participated in the 1960 study (98.8 percent). However, SSNs were only collected in the Year 1 (Y1) and Year 5 (Y5) follow-ups.[1] Therefore, for this study, the availability of SSNs as well as

[1] SSNs were not assigned at birth until 1987. Prior to that, most Americans applied for their SSNs when they left for college or began their first job.

updated name and address information is entangled with response propensity to the follow-up questionnaires, with the Year 11 (Y11) follow-up being the most important for name and address information and the Y1 and Y5 follow-ups being the most important for collection of SSNs.

Exhibit 1: Modal age of Project Talent respondents, by survey wave, year, and grade

		Project Talent high school probability sample			
Survey wave	Calendar year	9th grade	10th grade	11th grade	12th grade
Base year	1960	Age 15	Age 16	Age 17	Age 18
1-year follow-up	1961				Age 19
	1962			Age 19	
	1963		Age 19		
	1964	Age 19			
5-year follow-up	1965				Age 23
	1966			Age 23	
	1967		Age 23		
	1968	Age 23			
11-year follow-up	1971				Age 30
	1972			Age 30	
	1973		Age 30		
	1974	Age 30			
50-year follow-up	2010	Age 66	Age 67	Age 68	Age 69
	2011	Age 67	Age 68	Age 69	Age 70
	2012	Age 68	Age 69	Age 70	Age 71
	2013	Age 69	Age 70	Age 71	Age 72
	2014	Age 70	Age 71	Age 72	Age 73

Previous studies of nonresponse in Project Talent follow-ups have shown that students attending minority schools and students with lower test scores were less likely to have participated in one of the follow-ups (Flanagan and Cooley 1966; Orr 1963; Rossi et al. 1976). In addition, the studies showed a strong positive linear relationship between grade level and response propensity in each of the prior follow-ups that can be attributed to two factors: (1) an inherent selection bias related to school attrition for students in 11th and 12th grades during the 1960 data collection; and (2) the length of time between the 1960 collection and follow-ups (see exhibit 1).

This paper will examine the impact of key determinates on tracking success and efficiency. In particular, this research effort will attempt to answer the following questions: (1) Which key indicators are the most useful for tracking respondents?; (2) To what extent do sample members differ on substantive measures as a function of the key indicators examined?; (3) Which groups are easier to track using efficient and lower cost methods?; and (4) Within these groups, how are individuals located through different methods different from one another?. The findings will be used to inform and improve upon AIR's tracking strategies for Project Talent.

2. Study Design and Methods

2.1 Overall Design of the 2011–12 Project Talent Follow-up Pilot Study

The 2011–12 Project Talent Follow-up Pilot Study used a mail survey to evaluate the extent to which the original 1960 Project Talent participants (1) could be located, (2) would participate in follow-up studies, and (3) would provide consent for administrative linkages to Social Security Administration (SSA) records. The pilot study used a mail survey design 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. The analyses presented in this paper focus on the sample of study participants who were randomly selected to be tracked and then asked to complete a questionnaire as well as provide their consent to allow linkages to Social Security benefits and earnings data during data collection (*n*=4,159).[2] Study participants were between 67 and 70 years of age when data collection activities began.

2.2 Locating Sample Members

2.2.1 Existing contact information

Existing Project Talent records contain participants' first, middle, and last names in 1960; updated names and addresses through 1978; and participants' date of birth, SSN,[3] and 1960 school name and location. In addition, AIR has been compiling recent contact information through broader project-wide outreach activities (class reunions, score requests, etc.) since 2010. As a result, recent (2010–11) information—such as names, addresses, telephone numbers, and vital status information—was available for 213 of the 4,159 sampled cases at the start of the tracking activities.

2.2.2 Tracking plan

This pilot study used two types of tracking to locate sample members: batch tracking and interactive tracking. Contact information obtained passively through broader project-wide outreach activities was utilized as a last resort. The tracking activities employed for the pilot study are summarized in Exhibit 2.

Exhibit 2: Tracking activities employed for the 2011–12 Project Talent Follow-up Pilot Study

Activity	Population	Information collected (source)	
		Mortality	Addresses and/or phones
Batch tracking	All	LexisNexis; Death Master File; National Death Index	LexisNexis; National Change of Address registry
Intensive tracking and address verification	Any not found in batch tracking	Consolidated, proprietary tracking databases; web searches; phone verification	
Ongoing (passive) tracking through outreach activities	Nontargeted (convenience)	Class lists, Contacts	Reunions si; class lists, web sign-ups, score requests, contacts

[2] The data collection for this mail study consisted of a questionnaire only phase (Phase 1; n=720) and a second phase that included an additional request to allow linkages to Social Security benefits and earnings data (Phase 2; n=4,159). This paper focuses on the participants selected for inclusion in Phase 2 of the pilot study.

[3] SSNs were collected in the Y1 and Y5 follow-ups and are available for approximately 50 percent of the Project Talent population (approximately 85 percent of those who participated in either Y1 or Y5).

Batch tracking: AIR used LexisNexis's batch collection solution to collect up to the three most recent phone numbers and/or addresses, as well as the dates the person was first and last reported at the address, for any matched persons not identified as deceased in the LexisNexis databases. After this phase of batch tracking was complete, AIR sent newsletters to all presumed surviving participants with an updated address. Newsletters returned as undeliverable were logged by AIR and resent to the same address, mailed to an alternate address (where available), or submitted for interactive tracking (described below). AIR continued to send newsletters to new addresses and newly located participants through the beginning of September 2011 (approximately 15 weeks).

Expected mortality rates for this population cohort are 26 percent for men and 16 percent for females; therefore, an important part of the tracking activities for this population involves ascertaining a person's mortality status. In addition to the mortality information returned as part of LexisNexis's batch search, AIR ascertained the vital status of sample members through two rounds of batch matching to the SSA's Death Master File (DMF) using issues ending 5/31/2011 and 8/31/2011. Cases were later submitted to the National Center for Health Statistics for batch matching to the National Death Index (NDI), which, at the time of this study, contained a computerized index of death record information from 1979 through 2009.

Interactive tracking: The University of Michigan's Survey Research Operations unit (SRO), the data collection unit within SRC, carried out the interactive tracking for this pilot study. Shortly after newsletters were sent out, SRO carried out interactive tracking for the portion of the sample presumed to be surviving, but with no updated address after batch tracking was complete. AIR staff provided SRO with regular updates on undeliverable and other mail returns from the newsletter mailing, status updates obtained through mortality matching, and other updates from reunion and outreach activities so cases could be added or removed from interactive tracking as needed.

The first step of interactive tracking was to have a tracker conduct a search in proprietary web-based databases to obtain address and other contact information for the sampled participant. Contact information was also sought via free internet sources (whitepages.com, google.com). Social networking websites (e.g., Facebook) were occasionally used. If no contact information was obtained, SRO conducted an interactive vital status search using public websites (e.g., ancestry.com, findagrave.com, thewall-usa.com, sortedbyname.com, obituaries.com, legacy.com, Google searches, and local newspaper obituaries). SRO also carried out telephone verification for a special group of cases for which we had multiple recent addresses, had received conflicting information, or were uncertain whether the correct person had been located.

Other – Contact information collected through reunion and outreach activities: Starting in 2009, AIR undertook a number of outreach strategies aimed at relocating, and collecting current contact information from original Project Talent participants and reintroducing them to the study, in hopes of encouraging participation in future follow-ups. These strategies included offering participants copies of their original test scores, attending or sending information to 50-year class reunions, sending press releases to local media outlets, developing print materials, and establishing an online presence through a Project Talent website that included a participant registration page, Facebook page, and Wikipedia entry. In addition to the 213 sampled cases for which recent (2010–11) name and address information was available at the start of the tracking operation, AIR had collected recent name and address information for an additional 596 cases by the start of the data collection period. While much of the information collected through the outreach activities only confirmed information that had already been obtained through batch or interactive tracking, address and vital status information was obtained for approximately 50 individuals solely through outreach activities.

2.2.3 Analysis plan

The focus of this paper is on the key determinates of tracking success, which is defined as the identification of a sample person's current address or vital status. Any unresolved false leads identified during the tracking phase were coded as "not located" for this analysis.

Impact of key indicators on tracking outcome and tracking efficiency/cost: We first looked at the impact of a number of factors indicating the amount, type, or recency of information available for tracking to determine their impact on our locating efforts. Specifically, we reviewed the impact of a person's sex, grade level in 1960, availability of an SSN from the Y1 and/or Y5 follow-ups, availability of updated name information in the historical files (through 1978), last wave of participation, and availability of recent (2010–11) contact information prior to tracking on tracking success. One important design feature of the Y1, Y5, and Y11 follow-ups was the selection of a special sample of nonrespondents for intensive follow-up. Project Talent staff then applied intensive methods to locate and contact these individuals. When looking at the last wave of participation, we included a code for the "special subsample" of persons who, in spite of being included in at least one of the special nonresponse samples, only participated in the base-year data collection, as they are likely to be the most difficult to locate. We distinguish these base-year-only participants from the others by referring to them as "base-year special nonrespondents" (BY-I: Base year only, intensive follow-up in at least one wave). Base-year-only participants who were never included in a special nonresponse sample are referred to as "base-year-only participants" (BY-N: Base year only, no intensive follow-up).

Finally, though much of the 2011 reunion activities took place after tracking began, we hypothesized that AIR's reunion efforts may have increased the odds that a previously unlocated person would be prompted to get in touch after hearing about the study through the reunion or classmates. To evaluate this further, we included in our evaluations a variable that indicated whether AIR attended or sent information to a person's presumed 50^{th} class reunion in 2010 or 2011 (i.e., the class reunion of the school that person attended in 1960).

A multivariate chi-square automatic interaction detection (CHAID) technique was used to identify any interactions between the quality of key identifiers and contact information with issues related to response propensity in the follow-ups. The CHAID algorithm identifies the variables that are the most significant predictors of tracking status (the dependent variable) by calculating the chi-square measure of association between the dependent and each independent variable and then uses this information to successively partition the sample into subsets that are homogeneous in terms of tracking status. The predictor variable with the highest significance level for the chi-square test is used to split the sample into groups. This process is repeated for each of the predictor variables until there are no further logical splits or until there are too few observations for further splitting. The result is a tree-like structure that groups observations in the dataset into cells (or nodes) that have the greatest discrimination with respect to tracking status. For the purpose of this CHAID analysis, only variables having a Bonferroni-adjusted *p* value of less than or equal to .05 were eligible for segmentation and cells were required to have at least 45 observations; any partition that would result in a cell of fewer than 45 observations was rejected. The divisions produced in the CHAID analysis suggest where predictor variables are important and need further investigation.

The results of the CHAID analysis were then coded into a mutually exclusive category corresponding to their CHAID classification, which is designed to create classes that maximize the homogeneity within—and the heterogeneity with respect to—the tracking outcome. The resulting variable was retained for use as an independent variable in subsequent analyses. For example, to better understand which tracking indicator groups are more likely to require additional tracking resources, we next reviewed the proportions of cases located at each tracking step (batch, interactive, or other) for each of the classification cells produced in the CHAID analysis.

Differences across tracking classification groups on key measures from the base year: To evaluate the extent to which interactive tracking was able to locate subpopulations that were not found using batch tracking methods, we looked at average general academic test scores as a function of both the classification group and the tracking step at which a person was located. As stated before, students with lower test scores were less likely to have participated in the previous follow-ups. We also examined average scores on the composite measure representing families' socioeconomic status in 1960 (number of books in home, number of rooms in home, student-reported financial well-being) and the proportion of students who attended a high-minority school in 1960. Our hypothesis was that persons with lower aptitude scores, with lower socioeconomic scores, and from high-minority schools would be more difficult to locate during the batch tracking phase and, as a result, would require more resources to reduce the amount of nonresponse bias introduced during the tracking phase.

3. Results

At the start of data collection, the project team was able to identify 15.2 percent of the participants as deceased and to find updated address information for 70.2 percent of the remaining participants presumed to be living, yielding an overall locating rate of 85.4 percent. Approximately 71 percent of the cases were located at the batch tracking stage: nearly 95 percent of all decedents and 81 percent of all addresses. Interactive tracking was able to increase the overall tracking rate by nearly 13 percentage points. It was particularly successful at identifying addresses for persons not located through batch tracking: 95 percent of the cases located at this step were located with an address and the remaining 5 percent were identified as deceased. Fewer than 2 percent of all cases were located through some other means (e.g., reunion or outreach activities).

3.1 Impact of Key Study Design Factors on Tracking Outcome

Table 1 shows the distribution of the sample across the key factors under examination, as well as the results from the bivariate analyses evaluating the association between the dependent variable (*locating success*) and each of the key locating factors. As the table shows, the bivariate analyses suggest that all of the factors under examination had a significant relationship with tracking success and in the expected directions.

However, the multivariate CHAID showed that when considered simultaneously, only 5 of the 8 key locating criteria under examination were significantly associated with tracking success. As shown in figure 1, the resulting decision tree yielded a total of 8

Table 1: Sample distribution and locating rates, by key locating factors

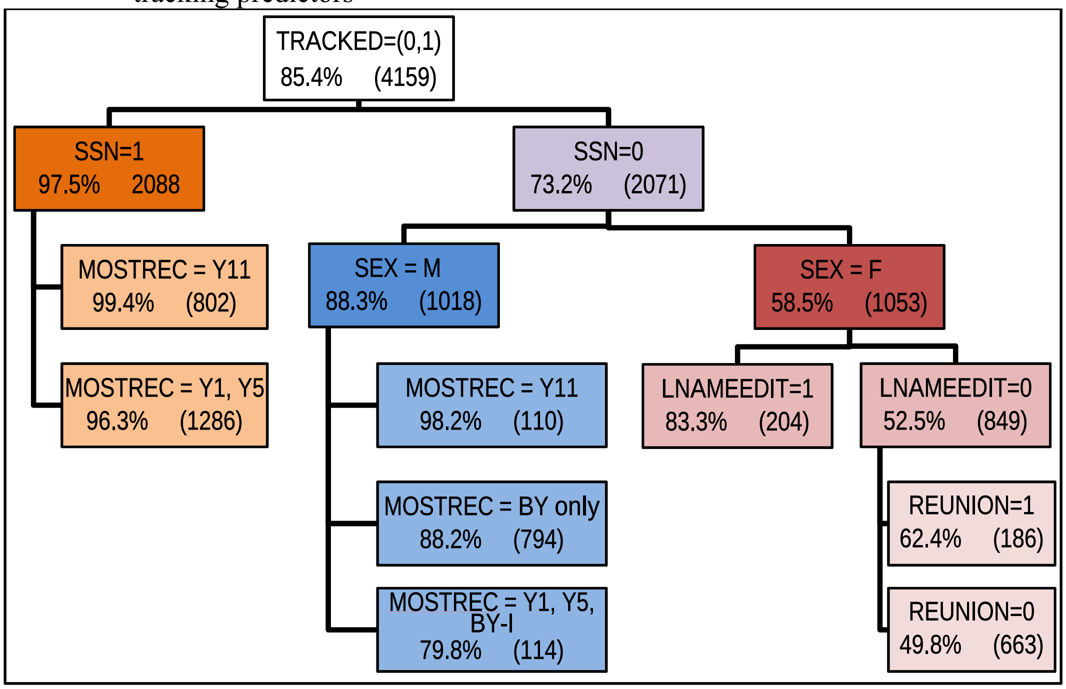
Key locating factors	Number	Percentage of sample	Locating rate	
Sex				
Female	2,145	51.6	78.0	–
Male	2,014	48.4	93.2	**
Grade level in 1960				
9	1,179	28.3	82.6	–
10	1,066	25.6	83.3	ns
11	1,045	25.1	87.6	*
12	869	20.9	89.1	**
Availability of SSN				
No SSN	2,071	49.8	73.2	–
SSN provided in Y1/Y5	2,088	50.2	97.5	**
Availability of updated name information (through 1978)				
New last name collected	845	20.3	94.8	**
Other update to name collected	195	4.7	89.7	*
No updates to name	3,119	75.0	82.6	–
Availability of recent (2010–11) name/contact information prior to tracking				
No information collected	3,886	93.4	84.4	–
Information collected directly	48	1.2	100.0	**
Information collected indirectly	225	5.4	100.0	**
Last wave of participation				
11-year follow-up (Y11: 1971–74)	1,037	24.9	97.8	**
5-year follow-up (Y5: 1965–68)	732	17.6	94.0	**
1-year follow-up (Y1: 1961–64)	814	19.6	89.9	**
Base year only, no intensive follow-up (BY-N: 1960)	1,543	37.1	71.0	–
Base year only, intensive follow-up in at least one wave (BY-I: 1960)	33	0.8	63.6	ns
AIR attendance at 50th-year class reunion				
Did not attend or send information to class reunion	3,122	75.1	83.7	–
Attended or sent information to class reunion	1,037	24.9	90.4	**

–indicates reference group.
** $p < .001$; * $p < .05$; ns not significant at the $p = .05$ level.

classification cells, or nodes. Not surprisingly, the CHAID analysis indicated that having an SSN was the most significant predictor of tracking success. Additionally, even when an SSN was available, the likelihood of locating a person for the pilot study was still 6.0 times higher if that person had participated in the Y11 follow-up than if that person had not participated. For those for whom no SSN was available, sex was the largest single differentiating variable, such that the average tracking rate for males was 88.3 percent compared to 58.5 percent for females.

For men with no SSN on file, the variable indicating when a person last participated was the biggest predictor of tracking success, such that those who participated in the Y11 follow-up had the highest tracking rate (98.2 percent), followed by those who participated only in the base-year collection and were never selected for inclusion in a special follow-up sample (88.2 percent) and those who participated in either the Y1 or the Y5 follow-up or only in the base-year collection, but were included in at least one special sample (79.8 percent). This latter group is the most notable in two ways. First, 90 percent of this tracking classification group participated in the Y1 and/or Y5 follow-up, but represent a small minority who did not provide their SSN in either data collection—making these individuals distinctly different from the 85 percent of Y1 and Y5 participants who did provide an SSN. The remaining 10 percent represent the group of special nonrespondents (BY-SNR) described previously.

Figure 1: CHAID classification tree predicting probability of being located, given key tracking predictors



SSN = SSN collected in Y1 or Y5; MOSTREC = most recent wave of participation; LNAMEEDIT = received updated last name before 1978; REUNION = AIR attendance at 50th class reunion; BY = base year.

For women, having an updated last name in the historical files was the biggest predictor of tracking success, such that we were able to locate 83.3 percent of those for whom we had an updated name through 1978, compared to 52.5 percent where the last name was not updated in the historical files. Within the latter group, the CHAID analysis suggests that we were 1.7 times more likely to locate a woman if we attended a 50th-class reunion for the school she attended in 1960.

3.2 Differences across Tracking Classification Groups on Key Measures from the Base Year

Table 2 shows the mean scores for the general academic aptitude and socioeconomic composites, as well as the percentage of persons attending a high-minority school, disaggregated first by a primary classification group (e.g., males and females with an SSN; males with no SSN; females with no SSN), and then by the more specific tracking indicator group. Within each primary classification group, there is a positive linear correlation between the locating rate and the mean aptitude and socioeconomic scores. Males and females with SSNs (group A) had the highest aptitude scores on average and were among those with the highest SES scores. Within group A, both aptitude and SES scores were higher for those who responded to the Y11 follow-up (subgroup A-1) than for those who did not (subgroup A-2). Similarly, for females with no SSN (group C), aptitude and SES scores were highest for the subgroup with the highest tracking rates (subgroup C-1) and lowest for the subgroup with the lowest tracking score (subgroup C-3), with subgroup C-2 in the middle. The pattern was similar for males with no SSN (group B), with one notable difference. The group with the lowest locating rate (subgroup C-3) had neither the lowest aptitude score nor the lowest SES score.

Table 2: Mean 1960 aptitude and socioeconomic scores and percentage from high-minority school, by tracking indicator classification

Tracking indicator group (from CHAID)		Number	Locating rate	General academic aptitude (mean)	1960 socio-economic status (mean)	Attended high-minority school (%)
(A) SSN (males & females)	(A-1) Responded in Y11	802	99.4	540.9	99.9	7.2
	(A-2) Yl1 nonrespondent	1,286	96.3	498.4	97.8	11.7
(B) No SSN (males)	(B-1) Responded in Y11	110	98.2	470.0	98.2	12.7
	(B-2) Responded in BY only	794	88.2	437.1	95.2	13.6
	(B-3) Responded in Y5, Y1, or BY-I	114	79.8	448.9	95.8	19.3
(C) No SSN (females)	(C-1) New last name	204	83.3	490.1	96.9	10.4
	(C-2) No new last name, reunion	186	62.4	468.6	96.9	10.9
	(C-3) No new last name, no reunion	663	49.8	426.4	93.8	20.1
	TOTAL	4,159	85.4	480.1	97.0	12.7

Though the correlation between the tracking indicator groups and the percentage who attended a high-minority school were not as clear-cut, the results indicate that two of the subgroups with the lowest tracking scores (subgroups B-3 and C-3) also had the highest conditional proportions of persons who attended a high-minority school. Notably, 46 percent of all females who attended a high-minority school were also in subgroup C-3; only 10 percent of males who attended a high-minority high school were in subgroup B-3 (not shown in table).

3.3 Impact of Key Tracking Indicators on Tracking Efficiency and Cost

The proportion of all cases located through batch, interactive, or another tracking step is provided in table 3. At least 90 percent of persons in subgroups A-1, A-2, and B-1 were located through batch tracking. Interactive tracking was able to narrow the distance between the two groups of Y11 respondents, but was not as successful for the Y11 nonrespondents (subgroup A-2). Just over two-thirds of persons in subgroups B-2, B-3, and C-1 were located through batch tracking and, through interactive tracking alone, an additional 12.3 to 18.9 percent were located. Fewer than 20 percent of the sampled females with no new last name (subgroups C-2 and C-3) were located through batch tracking. Interactive tracking yielded a 150 percent increase in the overall tracking rate for these groups. Comparing the percentages of persons located through other activities for these two groups, the results suggest that AIR's reunion activities may have been able to increase the overall locating rates by as much as 11.2 percent for the persons who attended the visited schools.

Table 3: Tracking step at which sample member was located, by tracking indicator classification

Tracking indicator group (from CHAID)		Number located	Tracking step at which sample member was located: Batch	Interactive	Other	Locating rate (total)
(A) SSN (males & females)	(A-1) Responded in Y11	802	96.1	2.7	0.5	99.4
	(A-2) Y11 nonrespondent	1,286	91.9	3.6	0.9	96.3
(B) No SSN (males)	(B-1) Responded in Y11	110	90.0	8.2	0.0	98.2
	(B-2) Responded in BY only	794	67.8	18.9	1.5	88.2
	(B-3) Responded in Y5, Y1, or BY-I	114	63.2	15.8	0.9	79.8
(C) No SSN (females)	(C-1) New last name	204	70.6	12.3	0.5	83.3
	(C-2) No new last name, reunion	186	19.4	30.6	12.4	62.4
	(C-3) No new last name, no reunion	663	17.3	31.2	1.2	49.8

While interactive tracking was successful at significantly improving the tracking rates for all of the groups with no SSN, table 4 suggests that in many instances this method was also successful for locating underrepresented groups. Table 4 presents the mean scores for general academic aptitude disaggregated by tracking outcome (identified as deceased; address located, person presumed living; not located), availability of an SSN in the Project Talent records, and sex.[4]

The table shows that across all subgroups, mean aptitude scores were lowest for those who were identified as deceased. Where an SSN was available, those who were not located had the highest mean scores on the general academic aptitude measure; this group's scores were nearly identical to the mean scores for the sample members for whom an address was found. Where no SSN was available, the mean aptitude scores for those not tracked through any method were nearly identical to the scores for those identified as deceased, and the mean aptitude scores were highest for those for whom an address was found.

Where tracking was successful at identifying a current address for persons presumed to be living, table 4 further disaggregates the mean scores by the step at which the sample person was located. As the table shows, females with SSNs who were located through interactive tracking had higher mean scores on the general academic aptitude composite than those who were located through batch tracking ($\mu_{interactive}$=555.1, μ_{batch}=521.7). Similarly, for males with no SSN, the mean aptitude scores were highest for the group located through interactive tracking ($\mu_{interactive}$=475.2), followed by those located through batch tracking (μ_{batch}=447.2). On the other hand, for males with an SSN and females with no SSN, individuals located through interactive tracking had lower mean scores on the general academic aptitude composite than those identified through batch tracking (males with SSN: $\mu_{interactive}$=498.0, μ_{batch}=513.6; females with no SSN: $\mu_{interactive}$=453.5, μ_{batch}=475.7).

[4] Due to small cell sizes, the mean scores could not be disaggregated further.

Table 4: Mean score on 1960 general academic aptitude measure, by step at which sample member was located, availability of SSN, and sex

Mean general aptitude, by tracking outcome	SSN		No SSN		
	Female	Male	Female	Male	Total
Number with nonmissing data	978	875	910	880	3,643
Located, presumed living	522.8	513.3	448.2	449.1	484.9
Located at batch tracking phase	521.7	513.6	475.7	447.2	500.5
Located at interactive tracking phase	555.1	498.0	453.5	475.2	468.7
Located by other means	†	†	480.1	†	500.6
Identified deceased by any method	504.4	482.4	430.2	416.3	452.2
Not located by any method	523.8	515.9	431.1	417.9	436.0
TOTAL	521.1	508.0	446.1	442.0	480.1

† $n < 10$ observations with nonmissing data.
Note that none of the differences reported in this table are statistically significant.

4. Discussion

Previous research has suggested that longitudinal studies can obtain high location rates for sample members for participation in future waves. However, a number of factors contribute to which sample members are located. This study evaluated the impact of key indicators about the type, age, and amount of information on tracking success and efficiency in a study where sample members have not been contacted in at least 37 years. Like many other studies, we found that the availability of an SSN greatly improves the effectiveness and efficiency of tracking. Interestingly, we found that the last wave of participation had a significant impact on tracking success even when we had an SSN, such that the tracking rates were significantly higher for sample members who participated in the Y11 follow-up than for those who did not. One explanation may be that people who were less likely to participate in the Y11 follow-up are also less prominent in the databases used for tracking.

Where no SSN is available, other indicators can be used to predict tracking success. The CHAID analysis suggested that when no SSN was available, males were significantly easier to find. The reason for this is twofold. First, women’s names are more likely to change due to marriage or other life events, which makes tracking more difficult. Second, many of the women in the Project Talent cohort would have married and changed their last name before the records often used to populate tracking databases were digitized. This means that, unlike the records for more recent generations of women (who are likely to have both their maiden and any married names linked in the tracking databases), the records associated with women in the Project Talent cohort are missing any mention of their maiden names.

For males with no SSN, the last wave of participation was again the key differentiating variable with respect to locating rate. The locating rates for males with no SSN who responded to the Y11 follow-up were comparable to the locating rates for persons with an SSN. Males who participated in the Y1 or Y5 follow-up and did not provide an SSN (or who remained nonrespondents in the follow-ups, despite undergoing intensive tracking and contact procedures) remain the most difficult to reach, even today. In comparison, locating rates for males who participated only in the base year and who were never selected for intensive follow-up were 8.4 percentage points higher. The difference between these groups, whose data are of comparable age and type, is likely attributable to undercoverage of these individuals in tracking databases and other public resources. While there is no way to test the hypothesis, it seems likely that these individuals may be more isolated or lead elusive lives that make them more difficult to locate using standard methods.

For women with no SSN, having an updated last name in the Project Talent records maintained through 1978 significantly improved the odds of tracking success; unlike the men, the impact of having this key piece of information was independent of the last wave of participation. Where an updated last name was not available, the locating rates were as much as 11.2 percentage points higher for women who attended schools that AIR visited as part of its reunion activities. One explanation could be that AIR's presence at these events, either through word-of-mouth or direct interactions at reunions, prompted more people from those schools to reconnect with the study. An alternative explanation is that schools with reunions found and attended by AIR are different in some other way, and at least part of the observed difference is due to the type of reunions AIR was able to locate and attend.

However, the results from this study indicate that the groups with the highest tracking rates are remarkably different from the groups with lower tracking rates in ways that could bias survey estimates. For example, sample members with SSNs available for tracking had significantly higher general academic aptitude scores, came from higher socioeconomic backgrounds, and were significantly less likely to have attended a high-minority school. Nevertheless, the results suggest that interactive tracking was at least partially successful in reducing these biases within certain subgroups. First, interactive tracking was successful in narrowing the gap between the aggregate tracking rates for males and females. In fact, where no SSN was available, interactive tracking yielded a 150 percent increase in the locating rates for women. Within this group of women for whom no SSN was available, disaggregated results suggest those located through interactive tracking generally had lower general academic aptitude scores than women with no SSN who were located through batch tracking.

Overall, the results of the Project Talent pilot are encouraging—suggesting that it is feasible to locate sample members even after a 37- to 51-year hiatus. The results of this analysis highlight areas where Project Talent and other studies can improve upon existing strategies for relocating sample members. First, future studies of Project Talent may benefit from more complex sample designs that take both key tracking indicators and substantive measures from the 1960 collection into account. Such an approach may be useful for minimizing costs while also ameliorating nonresponse biases. Second, given that at least some of the results presented here suggest that certain types of individuals may be undercovered in the credit bureau and public records databases as well as other internet-based resources, some consideration should be given to implementing alternate resources to track the hardest-to-reach sample members. For example, while field tracking may be infeasible or impractical for Project Talent, future tracking plans may want to include protocols for contacting local government offices (e.g., marriage bureaus or city halls) or even classmates to track down otherwise unlocated sample members.

One practical concern of this work is the number of false leads generated during tracking. In the best-case scenario, such errors are caught and corrected before data collection begins. In the worst-case scenario, the errors are caught after data collection ends or not at all. Though the final study results are not yet available, the preliminary data suggest that we were able to successfully locate and confirm the identity of around 60 percent of persons identified as "Located – Suspected living" during the pre-data collection tracking phase. However, at least 4 percent of those coded as "Located – Suspected living" during tracking were final-coded as "not located" during data collection, indicating that the wrong person may have been located. We have not yet been able to confirm the identity of at least 30 percent of the cases coded as "Located – Suspected living" during tracking.

Finally, we know we have at least some unobserved mortality in our tracked sample. Based on SSA cohort life tables, we would expect mortality rates of around 26 percent for males and 16 percent for females. To date, only 20 percent of males and 11 percent of females in the pilot study have been identified as deceased. Future analyses of the pilot study data will focus more closely on the issue of tracking quality to better understand what can be done to identify and reduce false leads in future studies.

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