Contact Histories: A Tool for Understanding Attrition in Panel Surveys

Nancy Bates, U.S. Census Bureau, Washington, DC 20233 nancy.a.bates@census.gov

Abstract

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Contact history records from personal-visit surveys provide real-time feedback to interviewers and serve as a management mechanism for regional offices and supervisors. Contact histories typically record the number of calls, time of call, date of call, and outcome for every contact or contact attempt prior to closeout. Previous studies of panel surveys suggest that feeding such information forward to interviewers at the next data collection is a critical procedure to minimize attrition over the life of the panel (Laurie, Smith and Scott, 1999). Such information increases the chance for contact, allows for tailoring strategies, and helps target those most likely to attrit the survey.

Background

The Survey of Income and Program Participation (SIPP) is a household longitudinal survey conducted by the U.S. Census Bureau. Like other longitudinal surveys, the SIPP is experiencing increases in attrition. In 2002, the SIPP Methods Panel (SIPP MP) sponsored a short-term research project to explore contact history logs. The SIPP MP is an experimental survey designed to test improvement and alternative measurement approaches for the core SIPP instrument. The contact logs were fielded during Waves 1 and 2, reflecting over 4,600 sample households and yielding over 20,000 contact records. This paper presents analysis of the contact histories with a particular focus on households that attrited between waves.

Basic research questions include: What contact strategies resulted in successful interviews in both Waves 1 and 2? Do households that attrit share common characteristics and if so, can we use these to plan better contact strategies? Did attriter households require an above average number of contacts in Wave 1? Results will help guide the development of an automated contact history instrument being designed for future longitudinal surveys.

Attrition in Longitudinal Surveys

During the last ten years or so, researchers have noted a general trend of increased nonresponse in U.S. government household surveys (Atrostic, Bates, Burt and Silberstein, 2001). Attrition can present a serious problem for panel surveys if the sample loses its representativeness over time causing estimates to be biased (Tin 1996, Lamas, Tin and Eargle, 1994). Longitudinal cohort surveys that interview the same sample repeatedly are particularly susceptible to increased levels of nonresponse.

A major concern about households that drop out of longitudinal surveys is that their absence may result in biased survey estimates – particularly if they differ significantly on critical aspects compared to those who stay in (e.g more or less likely to be in poverty, be in the labor force, have health insurance, etc.). Evidence to support the notion that attrition contributes to bias in the SIPP is mixed. Tin (1996) and Lamas, Tin and Eargle (1994) suggest that high levels of attrition could result in biased estimates of poverty statistics, particularly if attriters are more likely to come from poverty households. However, using SIPP data matched to Social Security Administration earnings records, Vaughn and Scheuren (2002) found that earnings from SIPP attriters might not be so different from those who continue when viewed over the long run. Thus the missing data may be largely ignorable when studying net changes.

Like other longitudinal surveys, the SIPP has experienced increased attrition rates over the last two panels. For example, in the 1992 SIPP Panel, the cumulative sample loss rate at Wave 7 was 23.0 percent compared to 29.9 percent in the 1996 Panel and 28.9 percent in the 2001 Panel (Eargle, 2003).

Given that attrition is on the rise, survey organizations have begun to implement various procedures designed to maximize panel response. Laurie, Smith and Scott (1999) characterize these procedures into roughly four categories: panel maintenance, tracking, refusal conversion, and fieldwork. Panel maintenance refers to efforts to keep track of panel members' whereabouts between surveys, including contact names and phone numbers, respondent phone numbers (land lines and cell phones), alternate addresses and change of address cards. Tracking encompasses procedures carried out by the regional offices to try and locate

movers for whom the field interviewer is unable to find a forwarding address. Refusal conversion is aimed at circumventing or at least reducing panel fatigue. Examples of refusal conversion techniques include enhanced interviewer training techniques that stress tailoring/maintaining interaction (Groves and McGonagale, 2001) and the use of monetary incentives (Martin, Abreu, and Winters, 2001; Singer, 1999; Willimack, Schuman, Pennell, and Lepkowski, 1995). The SIPP introduced an experimental program of incentives starting with the 1996 SIPP Panel that continued in the 2001 and 2004 panels. The fourth category of procedures is fieldwork and is the focus of this paper.

Maintaining a system of call records allows interviewers to consult the attempt histories for a given unit in order to determine things like best day of week/time of day to attempt contact, mode preferences for responding, and any special concerns voiced at previous interviews (requests spouse be present, works nights, child available as translator, etc.). It should also help gauge level of respondent 'fatigue' by noting any burden concerns voiced during interviews, e.g., 'I gave that information last time', 'interview takes too long'.

Fieldwork Procedures to Maximize Response: Contact Histories

In 2002, the Census Bureau decided to sponsor a short-term research project to explore the use of contact histories in a personal visit survey. Interviews from Waves 1 and 2 of the 2002 Survey of Income and Program Participation Methods Panel (SIPP – MP) were chosen as the vehicle. The SIPP – MP was an experimental panel survey carried out in six regional offices for the purpose of testing improvements and alternative measurement approaches for the core SIPP instrument.

Each wave of interviewing yields approximately 2,000 randomly selected households of which half are administered the experimental MP instrument and the other half the production SIPP instrument (the control)[1]. Interviews were conducted over a four-week period with four months in between waves. On average the interview lasts about 30 minutes per person (all household members age 15 and older). Initial contact is made by personal visit (PV) and most Wave 1 interviews are conducted in person by CAPI. If a respondent requests a telephone interview in Wave 1, procedures allow interviewers to call respondents and use the CAPI laptop to conduct the interview. During Wave 2, interviewers may arrange to conduct interviews by phone without any personal visits.

Because we had no automated system in place in 2002 and did not have sufficient time to build one, we elected to design paper-and-pencil contact history logs. The logs were first implemented in July-August 2002 as part of the SIPP - MP Wave 1 and then again during November-December 2002 during Wave 2. The logs were printed front and back on colored paper. One side contained a grid for interviewers to record the day, time, mode, interim contact code and comments after each contact or contact attempt. The flip side contained instructions and final outcome codes.

Among the set of interim codes, the logs contained a list of codes divided into Contact and Non-Contact categories. The contact codes were further divided into subcategories such as: eligible household member not home, language problem, respondent too busy (appointment set) and respondent refused. The non-contact codes consisted of subcategories such as: household did not answer door (but evidence of someone inside), unable to reach - gated community, no one home, telephoned - no answer, and telephoned - answering machine.

Interviewers were instructed to complete a record for each contact attempt (personal visit and telephone attempts). Trainers emphasized that information should be recorded even in 'drive by' cases where no one appeared to be home or when a telephone call resulted in a busy signal. Each log had space to record up to 10 attempted contacts. Cases requiring more than 10 attempted contacts completed a second log. When the case was deemed 'complete', interviewers were instructed to record a final disposition code along with the final contact date, time, and mode. Complete cases reflect final disposition codes such as completed interview, completed partial interview, noninterview (no one home), noninterview (household refused) and noninterview (language barrier). At the end of Wave 1, completed contact logs were gathered and mailed from the regional offices to headquarters and then keyed. Prior to sending, the ROs were instructed to make two copies of the completed logs, one for the office and one to send back to

[1] Each wave in the SIPP - MP had a sample size of around 3,000 households. Of these, approximately 2,000 were found to be eligible cases with a final status of 'interviewed.'

interviewers with Wave 2 Assignments (U.S. Census Bureau, 2002).

The Wave 1 sample consisted of 3,228 cases for which we received 2,965 usable contact logs – Wave 2 sample consisted of 2,503 cases for which we received 2,178 usable logs. This resulted in 90 percent of the cases having a corresponding contact log over both waves.

Results

Graph 1 plots survey productivity by various days of week and times of day. Productivity was defined as the number of completed interviews divided by the number of attempts. Saturday and Sunday reflect all hours during the weekend while weekday morning includes interviews from M-F 12:01 am - 11:59 am; weekday afternoon includes M-F noon-4:59 pm; and weekday evenings covers M-F 5:00 pm-midnight.

In both waves the survey productivity lines are similar with one exception – weekday mornings. In Wave 2, the percentage of interviews completed during weekday mornings is slightly larger compared to Wave 1 (24 percent versus 19.7 percent, respectively). Our hypothesis is that previous wave information is used to maximize interviews that can be conducted during weekday daylight hours – a time slot probably preferred by many Census interviewers, the majority of whom are female (71 percent) with a mean age of 53 (Bitzer, 2004).

When is the best time to make contact? In Wave 1, weekday evenings had the highest probability of making contact (.50 -- see Table 1). In Wave 2, weekday evenings again had the highest absolute contact probability followed closely by weekday mornings and weekday afternoons. When we narrow the focus to only first attempts (Table 2), results change for Wave 1. At the very first Wave 1 attempt, chances of making contact are practically identical for weekends and weekday evenings (.55, .55, .54) but substantially lower on weekday mornings and weekday afternoons (.38, .46). Success of contact at first attempt in Wave 2 was lower regardless of when the attempt was made but weekday evenings still proved best (.51).

In a previous analysis of SIPP-MP Wave 1 contact logs, Bates (2003) noted that interviewers prefer to make their very first personal visits on weekday afternoons. This is despite the fact that contact rates on first attempts are not as productive during weekday afternoons as they are on weekends and weekday evenings (see Table 2). Groves and Couper (1998) noted similar interviewer behavior in a national health survey and hypothesized that interviewers select this slot to 'pre-canvass' new clusters of assignments during daylight hours in order to gather initial information about the physical environment. After the first visit, interviewers begin to shift their visits to more productive time slots.

It is somewhat curious, then, why interviewers still prefer to make so many initial contacts in Wave 2 during weekday afternoons (N=625) despite the fact weekday evenings are more productive (probability of contact is .51 versus .43). One obvious answer is the increased use of telephone attempts in Wave 2 -- the time and cost of a phone non-contact is miniscule compared to personal visit non-contacts. To explore this, Table 3 further breaks out the probability of contact at first attempt by wave and mode of attempt.

Table 3 illustrates that first attempts in Wave 2 are almost equally divided between telephone and personal visit. For both modes, the chances of contact are best during weekday evenings. Consequently, it is hard to explain why *personal visit* first attempts are made most frequently during weekday afternoons (N=371) – the worst time to make contact compared to all other personal visit time slots? This statistic could indicate that interviewers are not making very efficient use of their personal visit first attempts -- the result being a costly and time-consuming non-contact. On the other hand, interviewers obviously cannot complete all their work during the optimal 2-3 hour evening timeslot. They must do the best they can to balance their entire workload and make contacts at productive times. Finally, the Census Bureau pays a 10 percent pay differential after 6:00 pm – if interviewers tap this differential too much, the costs may outweigh the benefits.

Contact Histories and Characteristics of Attrition Households

In the section that follows we examine contact histories for those who continued in the SIPP-MP compared to those who left through attrition. Table 4 breaks out the average number of contacts/contact attempts in Wave 1 by Wave 2 attrition status.

The critical numbers to take away from Table 4 are the average number of contacts required in Wave 1 *for households that attrited in Wave 2.* For every category of attrition with the exception of movers

never traced, attrition households required significantly more contacts in Wave 1 than non-attrition households. Where continuers in Wave 2 required an average of 3.5 average contacts in Wave 1, households that became refusals in Wave 2 required 4.4 contacts in Wave 1. Likewise, households that attrited in Wave 2 due to noncontact required an average of 4.5 contacts before an interview was completed in Wave 1.

This clearly suggests that number of contacts could be used as a predictor of attrition in later waves. Households with higher than average contacts in early waves could be identified as potential attriters and earmarked for special field procedures in later waves. For example, in the British Panel Household Survey, Laurie, Smith and Scott (1999) report that in cases where six or more calls were made at the previous wave, call records are automatically fed forward to interviewers. Research shows that interviewers are more effective in refusal conversion attempts when descriptions of call records from previous attempts are made available (Ahmed and Kalsbeek, 1998). The SIPP and similar panel surveys could establish a similar threshold based on previous wave contact histories and put procedures in place to work these cases early and pay special attention in an effort to circumvent panel loss.

To further study the characteristics of attriters, we merged the W1 and W2 contact log data files with the Wave 1 SIPP-MP survey data. This allowed us to examine survey data about attriter households collected in Wave 1. The purpose of this analysis is not to study attriter characteristics in order to better understand bias but rather to isolate the physical and household characteristics of attriters to try and uncover new ways to adjust field procedures.

The contact log/SIPP merge data yielded matched records for 2,131 households, 140 of which attrited in Wave 2. Table 5 presents attrition status by household characteristics for those households where a contact log was available and successfully merged with SIPP data and the information was collected in Wave 1.[2] We illustrate only the three major attrition categories -- movers not traced, noncontacts/no one home, and refusals -- and contrast these with households interviewed in Wave 2.

[2] By definition, only households that are interviewed in Wave 1 are in-scope at Wave 2 – noninteviews in Wave 1 are permanently dropped from the survey.

Compared to interviewed households, refusal households in Wave 2 disproportionately overrepresented those who rent, are comprised of persons under age 30, and have children younger than 5 years old. Refusal households were unlikely to be made up of persons older than 69.

The number of attrition cases resulting from movers not traced and noncontacts is smaller than refusals, thus inferences about their characteristics become more suspect (only 30 mover and 20 noncontact households, respectively). This caution noted, Table 5 suggests that noncontact attrition households overrepresent renters, addresses in multi-unit structures, single person households and younger households. They appear less likely to represent older households and households with young children. Movers not traced reflect classic characteristics of residential mobility, that is, renters, multi-unit addresses, young and single person households. Looking across all three attrition categories, two commonly shared characteristics emerge -- renter households and households comprised of all young people. Households that attrit are less likely to be comprised of older people.

How might field procedures be altered to reduce noncontact attrition? Table 6 examines cases with characteristics common to noncontact attriters (single person renters in multi-unit structures) by probability of contact in Wave 1. Results suggest that it is indeed difficult to make contact with this subgroup. Across all attempts, the Wave 1 probability of contact is well below .50. However, the best time appears to be on Sundays and weekday mornings. This is a different pattern from all Wave 1 households where chance of contact is highest on weekday evenings. This type of information should be made available to the Regional Offices, supervisory interviewers, and rank and file interviewers to help reduce noncontacts in subsequent waves. In many surveys, interviewers are given their entire assignments at the beginning of the field period – with previous call history information and a little planning, work efforts can be more efficiently spent on days and times when chances are best for contact.

Summary and Recommendations

In this paper, we explore the notion of using historical contact records as a tool for stemming attrition in panel surveys. Presumably, interviewers can more effectively manage cases and refusal conversions when records are fed forward wave to

wave, not just within a cross section of data collection. Our analysis indicates that contact histories may prove useful particularly as a way to target potential attriters in subsequent waves.

Our first recommendation is to use number of attempts in prior waves to identify potential attriters in later waves. Our analysis indicates that refusal and non-contact attriters require an above average number of contacts in previous waves – this can be used as a way to identify potential attriters. Interviewers can begin to work these cases sooner, request customized advance letters, and use information as to why respondents were reluctant to lessen future resistance.

Our analysis also suggests that household attrition due to noncontact tends to over-represent single person households who rent in multi-unit buildings. During the four week field period of the SIPP-MP, the best time to contact these households was found to be during weekday mornings and on Sundays. We propose that interviewers have access to this type of summary information to reduce noncontacts and maximizing efforts during these time periods.

In their study of interviewer notes, Martin, Abreau and Winters (2001) found that households who complain about survey burden or express intent to quit the survey are, in fact, more likely to attrit. The SIPP-MP contact logs contained a comment field for interviewers to record notes from each contact attempt. These fields were keyed but to date, we have not attempted to code them in a systematic fashion to try and replicate the findings of Martin, et al.

For the future, we recommend that contact histories be automated so that reasons for reluctance and interviewer comments can be easily captured and systematically analyzed. For example, interviewers could select from precodes describing reluctance on the part of respondents, e.g., privacy concerns, last interview took too long, intends to quit survey, not interested in topic. If certain statements are found to be predictive of future attrition, these could be automatically noted in the contact histories and used to trigger special refusal prevention measures. For example, households that express a desire to drop out of the survey and also complain of privacy concerns could be earmarked to receive a customized refusal conversion letter addressing these concerns prior to the next wave contact. A similar technique has proved successful in the Panel Study of Income Dynamics, a longitudinal study of families (Stafford, 2004).

In fact, the Census Bureau is moving toward this recommendation. In January 2004, for the first time, the Census Bureau implemented an automated system for collecting contact histories in a CAPI survey. The Contact History Instrument (CHI) is a stand-alone instrument programmed in Blaise. It is compatible for use in CAPI surveys having a GUI case management system. The CHI allows interviewers to view contact histories at a glance in case management and also produces standardized aggregate-level reports for use by the Regional Offices.

The CHI was used in production for the first time in the National Health Interview Survey, a cross-sectional survey conducted annually (see Piani, 2004). The original instrument has undergone revisions based on interviewer feedback and analysis of data from the NHIS. A second version of CHI will be used in the 2005 Consumer Expenditure Survey and the 2005 NHIS. A new enhancement will allow supervisory field representatives to view their team's CHI records. Another change will allow interviewers to record reasons for reluctance by adding a new 'reluctant respondent' screen for both interviews and refusals. The new instrument has also been adapted for use in longitudinal surveys such that previous wave contact records can be fed forward and available to interviewers in later rounds of interviewing. We anticipate the expanded use of CHI will produce even richer datasets upon which to continue attrition research and expand our understanding of how contact histories may reduce it.

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Graph 1. Survey Productivity by Day/Time by Wave
(productivity = # completed interviews / # attempts)

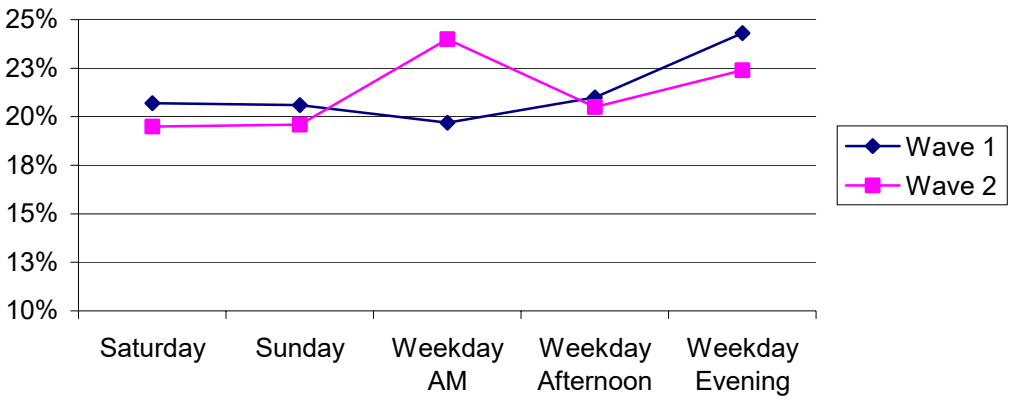

Table 1. Probability of Contact by Day/Time by Wave
***(All attempts** – personal visit and phone combined)*

	Saturday	*Sunday*	*Week Morn.*	*Week After.*	*Week Evening*
Wave 1 –	.44	.45	.44	.46	.50
	(1546)	(789)	(1221)	(2712)	(3362)
Wave 2 –	.41	.42	.46	.45	.47
	(1395)	(913)	(1402)	(2189)	(2895)

Table 2. Probability of Contact by Day/Time by Wave
***(1st attempts only** – personal visit and phone combined)*

	Saturday	*Sunday*	*Week Morn.*	*Week After.*	*Week Evening*
Wave 1 –	.55	.55	.38	.46	.54
	(323)	(110)	(288)	(1059)	(633)
Wave 2 –	.43	.46	.40	.43	.51
	(307)	(176)	(366)	(625)	(547)

*Table 3. Probability of Contact **at First Attempt** by Day/Time by Mode by* Wave

Mode	*Saturday*	*Sunday*	*Week Morn.*	*Week After.*	*Week Evening*
Wave 1 – *Pers. Visit*:	.55	.55	.38	.46	.54
N	(323)	(110)	(288)	(1059)	(633)
Telephone:	--	--	--	--	--
Wave 2 – *Pers. Visit*:	.43	.43	.40	.39	.47
N	(191)	(95)	(136)	(371)	(207)
Telephone:	.42	.46	.38	.47	.53
N	(111)	(81)	(230)	(254)	(339)

Table 4. Mean number of Wave 1 contact/contact attempts forAttriters vs. Continuers
(in scope cases only)

	Mean contacts W1
Continuers -Wave 2:	3.5
(N)	(1,819)
Attriters - Wave 2:	
Refused	4.4
Noncontact	4.5
Movers, not traced	3.8
Other nonintervew	4.9
(N)	(132)

Table 5. Characteristics of Wave 2 Attriters (Movers/Noncontacts/Refusals) Compared to Continuing Households

	Wave 2 Outcome Status				
Household Characteristic	*Interviewed*	*Movers*[a]	*NOH*	*Refused*	*(Total)*
Renter:					
Yes	31%	83%	50%	45%	32%
No	69%	17%	50%	55%	68%
Multi-Unit:					
Yes	23%	63%	44%	22%	24%
No	77%	37%	56%	78%	76%
Single Person:					
Yes	26%	37%	50%	23%	26%
No	74%	63%	50%	77%	74%
Young (all <30):					
Yes	10%	40%	20%	16%	11%
No	90%	60%	80%	84%	89%
Child (<5 present):					
Yes	12%	27%	5%	20%	13%
No	88%	73%	95%	80%	87%
Old (all >69):					
Yes	12%	0%	0%	3%	11%
No	88%	100%	100%	97%	89%
Base N =	(1819)	(30)	(20)	(61)	(1951)

[a] Household known to have moved between waves but never traced.

Table 6. Probability of Wave 1 Contact by Day/Time for Single Person/Multi-unit/Renters – Likely Noncontact Attriters (all phone and PV attempts combined)

	Probability of Contact in W1				
	Saturday	*Sunday*	*Week Morn.*	*Week After.*	*Week Evening*
Single-Person Multi-unit/Renters –	.30 (156)	.42 (79)	.43 (125)	.38 (231)	.35 (256)
All W1 households –	.44 (1546)	.45 (789)	.44 (1221)	.46 (2712)	.50 (3362)