

**SURVEY OF
INCOME AND
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PARTICIPATION**

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**The SIPP Event History Calendar:
Aiding Respondents in the
Dating of Longitudinal Processes**

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This paper reports the general results of research undertaken by Census Bureau staff. The views expressed are attributable to the author and do not necessarily reflect those of the Census Bureau.

TABLE OF CONTENTS

	Page
Introduction.....	1
Calendar Development.....	2
Analysis.....	5
Calendar Redesign.....	9
Conclusion.....	10
References	

Introduction

In 1983 the Bureau of the Census initiated the Survey of Income and Program Participation (SIPP), a survey designed to measure the economic and social changes in persons lives over time. The survey relies on a national household sample, with in-person interviews of all persons ages 15 and over. Households are in sample for a total of 32 months and are visited by an interviewer every four months (for a total of 8 interviews). During each interview (referred to as a "wave"), subjects are asked questions about their employment, economic situation and program participation for each of the preceding four months. Each wave of the survey is processed separately, and only after all waves are collected are all of the data brought together to produce a full 32-month longitudinal file. In this respect, the SIPP is administered and processed much like a series of conventional cross-sectional surveys. The primary difference is that individuals and sampled households are followed (for example, if they physically change residences) with the intention of ultimately being able to provide a full 32 months of longitudinal data for each respondent.

The survey makes some limited use of dependent interviewing techniques, but this is not a fundamental aspect of the survey. A major topical concern of the survey is the length of time that individuals spend on income transfer programs; for example, social security, AFDC, food stamps. In each interview, the section in which this information is "updated" uses a general question to remind the respondent what was reported in the prior interview (wave), and then asks if these sources were still being received for the current interview period (see Attachment A). Similar sorts of reminder questions are also used for assets. (These reminders are used for the receipt of items, not the amounts received.)

During the development of the survey, it was thought that probes such as those in Attachment A would act to remind the respondent of the information collected through the end of the prior wave, and prepare them for the interview for the current period. An empirical evaluation of this issue was not possible until data had been collected for several waves of the initial panel of the survey (the 1984 panel, begun in the fall of 1983). In one of the first analyses of these data, Burkhead and Coder (1985) identified what has come to be referred to as the "seam problem", an inordinately high number of transitions in statuses occurring at the months which also demarcate distinct interviewing periods (waves) of the survey. In essence, Burkhead and Coder's paper showed that transitions (either "on to", or "off of", programs) were much more likely to have been

reported when the two months in question were from two different interviewing periods. This effect was documented across a wide variety of income sources.

The Burkhead and Coder analysis was verified both in subsequent research as well as in results from other surveys. For example, Moore and Kasprzyk (1984) identified similar patterns in the Income Survey Development Program (ISDP), and Hill (1987) did the same using the Panel Study of Income Dynamics (PSID). (Note that in the ISDP the reference period was 3 months; in the PSID it was one year; and in the SIPP it is 4 months.) In the PSID, Hill showed that the ratio of seam month to the average non-seam month transitions was at least as high as in the SIPP, and perhaps higher. More recently, Martini (1989) has shown that the seam effect is also present in the transitions between employment statuses.

While there was concern about the "seam problem", it was not clear what action should be taken to alleviate it. Operationally, a problem existed because much of the processing design of the survey had already been developed and implemented; a redesign of the basic instrument was impractical, especially when research on the "seam problem" had just begun. One modification that was considered and implemented changed the income roster slightly in order to have the respondent specifically identify the month in which a listed income source either ended or began. Because of the long lead time necessary for review and clearance, however, this modification was only introduced in the 1988 panel of the survey, with the expectation that sufficient data for evaluation would not be available until 1990 or 1991 at the earliest.

Calendar Development

During the time when the issue of the seam problem came to light, discussions began about the possible use of an alternative data collection tool that might act to reduce seam problems and at the same time yield better-integrated data about the longitudinal dynamics of individuals lives. These discussions centered around the use of a time-line or calendar recording device that would represent the calendar months of exposure in the survey. Part of the concern with the 8-wave/4-month interview design was that respondents did not understand the importance of dating events to the exact month. As such, they might tend to date events only within the 4-month interview period without considering (or remembering) answers from the previous wave. Telescoping events

(either on or off a program, for instance) to include the entire 4-month period would have the effect of creating too many seam transitions at the expense of within-wave transitions. Additionally, the traditional questionnaire format used in SIPP (that is, independent question sequences about each specific income type or life circumstance) did not lend itself well to measuring sequential casual and temporal changes in persons lives (e.g., losing a job, having to move because of it, and going on to food stamps). In these respects a calendar device seemed a useful aid that might act to improve respondent understanding of the survey itself, as well as the need for the accurate reporting of dates.

During the spring of 1988, we began considering ways that a calendar device might be brought into use in the SIPP. Existing calendars, such as that used in *The Study of American Families* (Freedman, et. al., 1988), were studied as prototypes for the SIPP. In addition, we considered shorter-term calendars, such as an 8-month calendar, which would show the respondent their answers from the previous interview only. A 12-month variant would have also shown responses from the previous wave, but would be left with the respondent to fill out for the subsequent four months (i.e., the next interview) as well. Each of these calendars required that they be reissued with each interview. Ultimately, we decided to use a calendar which would reflect the entire 32 months of exposure for the respondent in the survey, recognizing that such a device might make respondents all too aware of the length of their requested involvement, but reasoning that this reminder might be more useful in the collection of good longitudinal data than harmful to the sample.

An "operational changes working group" began to consider the context in which this was to be done - an ongoing survey could not simply be shut down for redesign, or have additional respondent burden added to it. The calendar could not replace or supplant any existing data collection instrument. The group decided that the calendar could best be implemented if it was developed and used as an aid for respondents - not as a tool to help interviewers, nor as the actual data collection instrument. At least part of the seam problem was seen as a function of the survey's inability to successfully involve the respondent; it was thought that the calendar could be used as a device to show individuals their "lives in a nutshell", and to understand that many different events in their lives are related and that these relations are important for us to measure accurately.

The working group decided to concentrate on the seam effect as it related to the simple status of "on" and "off" programs, rather than to monitor changes in the amounts reported by recipients of programs. Analyses by some researchers had indicated that reports of program amounts were behaving similarly to simple event transitions, that is, showing much greater month-to-month variability when the months crossed interview waves. Although this issue is an important one, the basic on/off program status seemed more fundamental, and easier to address. Finally, the group decided that while the primary focus of the calendar would be the various economic programs measured by the survey, other basic social and demographic events such as employment, marital status and household size would be included on the calendar, but that asset information, also collected in SIPP, would not.

The results of the working group resulted in the calendar form that is shown in Attachment B. This calendar is designed to be used in conjunction with the existing survey instrument and interview. Each interviewed person has their own calendar. After completion of the first interview (wave 1), the interviewer fills out the calendar using information obtained from the standard questionnaire and control card. This work is done by the interviewer in their own home, so no additional burden time is placed on the respondent. Beginning with the wave 2 interview, the interviewer hands the appropriate calendar to the person to be interviewed (or their proxy) prior to the start of the interview, and briefly introduces its purpose. The ensuing interview follows exactly the same form as if there were no calendar at all. During the interview the respondent is able to look at the calendar and the events recorded on it. On the right side of the calendar is a list of all of the income sources the survey attempts to measure. There is no occasion in the survey when the respondent is ever shown a complete list of all the income sources we are interested in; we use the opportunity to show the list in case a source has been inadvertently omitted by the respondent. At the conclusion of the wave 2 interview the interviewer "updates" the calendar using information obtained in that interview, after leaving the household. This procedure is followed in each subsequent wave through the last interview.

Since there was neither money nor time for an experimental panel to test the calendar aid, we introduced the calendar into a new panel. The calendar was implemented in only one region, but for all cases of this panel in this region. The rationale behind this was to minimize project costs while at the same time providing a realistic setting to

evaluate the calendar in an administrative as well as a data quality context. We also chose this approach to address the concern that "experiments" are sometimes viewed with less than full acceptance by the field interviewers; for this region the calendar was an official change in procedure.

The calendar was implemented in the Chicago region (comprising 2 states, Illinois and Indiana) beginning in February 1989 with the start of the 1989 SIPP panel. Interviewers were trained in January regarding the basic purpose and procedures for the calendar. Additional training was held in May (prior to the start of wave 2) to provide instruction on the use of the calendar in the actual interviews and updating procedures. Interviewers were instructed to use the calendar in every household, for every respondent, unless there was a clear indication that doing so would seriously jeopardize the interview.

Analysis

Since the calendars were not a part of the established data collection of SIPP, we developed a method to obtain calendar data for analysis. Beginning with the June 1989 interviews of SIPP (the first month of the 2nd wave), calendars were photocopied in the regional office after check-in and sent to Washington. This procedure was followed each month through completion of wave 3. Interviewers were instructed during training that if a respondent questioned the accuracy of any information on the calendar for a prior wave that the interviewer should "correct" the information, and make a numbered notation with an explanatory note on the back of the calendar. This would allow us not only to study within and between wave transitions, but presumably other factors such as response inconsistency. While the original study was intended to run for the duration of the entire panel (8 waves), long-term budget concerns for the SIPP program caused the entire 1989 panel to be terminated after wave 3. This analysis is based on data from the 3 waves of the 1989 panel.

Table 1 shows the ratio of reported transitions in the average seam month versus the average nonseam month. This measure is shown not only for various programs based on the data collected with the calendar, but also for several other studies and data sources. One problem in comparing research results is that each study has tended to look at the seam problem differently. I have attempted to consistently represent the results of these studies to provide some comparability between them.

Of course, other sources of noncomparability between the studies remain, and may affect the ability to make direct comparisons. In addition to the different reference periods of the ISDP, PSID and SIPP, the sampling schemes of these surveys are also somewhat different. Also, while many of the results are based on national samples, the calendar was used only in the Chicago region. One cannot say if the phenomenon of the seam effect is more or less pronounced in this region, but there is no a priori reason to hypothesize any difference from the rest of the nation.

Results from the surveys referred to as A, B and C are from studies discussed above; results from survey D are taken from an internal Census Bureau memorandum by Hill (1989). As mentioned before, the early concern with the seam led to a slight modification in the Income Source Summary listing beginning with the 1988 panel. Hill obtained early unedited data from the first 2 waves of the 1988 panel to look at the effect of the change in the ISS. His conclusion was that the modification did not change the seam effect. Comparison with results from surveys A and B seem to reinforce this.

Examination of the calendar-based data (shown as survey E) indicates that the calendar may have had some positive effect in reducing the relative level of seam transitions, but that the problem still exists. (Without weighted data and appropriate standard errors, exact tests to determine statistical significance cannot be made.) There were a total of 1918 calendars (cases) from the Chicago region. Of these, 343, or 18%, had at least one transition in a program or health insurance (122 in health insurance only, 221 in programs). These 343 cases contained a total of 537 transitions (147 in health insurance and 390 in ISS codes 1-56). The 12 months (3 waves) of data provide 11 possible monthly transition points, 2 of which are "seams". The overall seam-nonseam ratio across all 56 measured income source codes in the calendars is 2.8, that is, the average seam month had 2.8 times as many reported transitions as did the average nonseam month. The only other estimate for the entire group of 56 income sources comes from the Hill analysis of the 1988 redesigned questionnaire, which yielded a seam/nonseam ratio of 3.2. (A 2x2 unweighted table of seam and nonseam transition cases by interview type (calendar or 1988 panel) yields a chi-square value of 23.2 with 1 degree of freedom. If we consider these samples as populations, the results show that the relative level of seam transitions is markedly reduced in the calendar data.)

Two income sources, private pensions and private health insurance, are quite high in the calendar (7.9 and 6.5). Private health insurance had not been examined in the other studies, but pensions had shown ratios of 6.7, 6.2 and 6.6 in three other studies. Several major programs such as social security, AFDC and food stamps, while still higher than 1 in ratio terms, had smaller ratios in the calendar than in any previous study.

The high ratio for health insurance is somewhat curious. Examination of the calendars showed that many of the changes in health insurance were concurrent with changes in jobs or employment status, but that many others were not. One possible explanation is that private health insurance often affects many members of a household, and when the holder of the job loses (or starts) insurance other individuals are affected (whether they are employed or not). With the individual calendars used in this analysis, it is not possible to look at such household or family-level effects. But, to the extent that an employment change was misdated, so too might be the corresponding health insurance date for the entire family. Another possibility is that health insurance, unlike income transfer programs, is less salient and more susceptible to telescoping and misdating by respondents.

The reduction in the relative level of seam transitions because of misdating was only one way that the calendar was expected to improve the data. It was also expected that the calendar would prevent misstatement of events which if left uncorrected would yield spurious transitions. In the entire set of calendars there were 79 instances where respondents requested that some piece of information recorded at an earlier wave be modified because it was incorrect. (Interviewers were told to accept any modification that a respondent wished to make to a calendar. The interviewer would change the calendar as directed, then make a notation identifying the change, with a note on the back of the calendar explaining the change and why it was requested.) These changes were varied in nature; in some cases health insurance or income programs had been incorrectly identified, or not reported at all, while in other cases earnings amounts or other household information had been incorrectly reported. Data from the record check study of Marquis and Moore (1989) has indicated that misspecification of programs in consecutive interviews is a major factor underlying "false transitions". A respondent identifying program A at time 1 and program B at time 2, when in fact it is the same program at both times, has created two spurious transitions, not one. The calendar afforded the opportunity for respondents to review and change data for prior waves, and

a small proportion ($79/1918 = 4\%$) chose to do so. However, 33 of the 79 corrections occurred in calendars where other transitions were observed (or $33/343 = 10\%$). While a misstated transition is bad for any case, one occurring for a respondent who has other transitions occurring could act to distort the dynamic of that case. Young (1989) has considered the possible impact of the seam effect in a multivariate context. He concludes that while the univariate cross-sectional effects may be large, correlational statistics are less biased. This conclusion is less assured, however, in situations where one event is correctly specified, but another is not.

One hypothesized reason for the occurrence of false transitions is that different respondents may report the same program or event differently. However, most of the calendars with transitions had the same respondent in the 2 waves which included the transition. Only in about 14% of all (transition) calendars were there different respondents in the two relevant waves. (This is not to say that only seam transitions were considered - any two waves which included a transition were examined for same or different respondent status.) In general, calendars experiencing a transition (of any type) were no more likely to have experienced multiple respondents in the three waves than were those that showed no transitions (28% of transition calendars vs. 27% of the no-transition calendars). A different hypothesis is that changing interviewers may also affect transitions. There were several cases of calendars with notes where the interviewer claimed that information had been missed or incorrectly recorded by "the previous interviewer". However, Vick and Weidman (1989) examined both self-proxy and changing interviewers as causes of the seam problem, and concluded that while both had some small effect, they were not the primary factors underlying excess transitions at the seam.

While analysis of the calendar data indicates some improvement in the level of seam transitions, our evaluation of the experiment was not limited to changes in the empirical data. One concern in implementing the calendar was that it might affect respondents such that they would refuse to participate in the survey. Table 2 shows the nonresponse rates for the Chicago region and the nation for the 1989 SIPP panel through the third wave of interviewing. As can be seen, the Chicago region maintained consistently lower refusal rates than the nation as a whole through all 3 waves of interviewing. Comparing the Chicago rates for the 1989 panel to those for the 1988 panel also indicates that the 1989 nonresponse rate was no worse in Chicago than in the previous year.

As part of the evaluation process a number of individuals observed field interviews to see what effect the calendar was having. The general consensus of the observers was that the calendar was not a problem in interviews. To a large extent this was because the calendar was being used very little, if at all, in most interviews. Usually, an interviewer would hand a calendar to a respondent, who would look at it and then set it aside for the remainder of the interview. There were a number of instances reported where respondents would note a problem with a calendar entry in a previous period, and bring this to the attention of the interviewer, but generally the calendar was not being actively used in the context of the interview. To some extent this was intentional. We had reminded interviewers in their training that the calendar was to be used as a respondent aid only -- the questionnaire was still the official data-recording instrument of the survey. With little cause to refer to the calendar, most respondents generally set it aside as quickly as possible. This "lack of integration" was one of the main concerns voiced by the interviewers when we met with them in November 1989 to discuss the calendar and their experiences in using it. While few interviewers felt the calendar had hurt response, and some felt it had in fact helped, most interviewers felt respondents were indifferent to its use.

During our debriefings also heard several suggestions for modifications. While we had left amounts off the calendars to maintain simplicity, many persons, both interviewers and respondents, asked that program amounts be put on the calendar. In addition, we were told that the calendar had to become a more central part of the interview.

Calendar Redesign

In an attempt to improve the calendar we made several modifications for its use in the 1990 SIPP panel. Attachment C shows the calendar as it has been redesigned. First, income sources are now numbered and listed in the same order as in the survey itself. We have also tried to make it clear that all ISS codes 1-56 are to be listed on the calendar, since in the debriefings we found a small group of interviewers who were not aware of this, and who were only marking the preprinted income sources. Pensions are now included with the income sources, since they are counted as income in the SIPP. Also, because both interviewers and respondents felt so strongly about it, amounts for income sources 1-56 are now included on the calendar (instead of an "X" indicating receipt only). A second major change in the calendar is not apparent by looking at it.

Interviewers now have four specified times during the SIPP interview where they are to pick up the calendar (or point to it) and introduce it. The recommended phrase is: "Referring to the calendar at this time may be helpful in answering the next series of questions." The idea is to draw attention to the calendar at those points in the interview (updating the Income Source Summary, discussing health insurance, and specifying wage and salary income) where the calendar can do the most good.

A final modification of the calendar concerns its use in situations where someone provides information for another individual (proxy interviews). While proxy interviews are not encouraged, they are allowed in SIPP. In fact, about one-third of all interviews are conducted via proxy. Since the original version of the calendar revealed no more information than in the context of a normal interview, there was not a problem in showing a calendar to a proxy respondent. With the addition of program amounts to the calendar, however, the calendar contains information which cannot be shown to another respondent. To accommodate this situation, interviewers are only to use the calendar with self-respondents, or with a proxy that has remained the same for all waves. Patterns of who responds over time have not been monitored in the past (apart from the basic self-proxy distinction). While we hope this procedural change will not affect a large number of cases, we will not be able to tell until analysis of the 1990 calendars begins later this year.

Conclusion

While the introduction of the event calendar in the SIPP did not eliminate the seam problem, there is encouraging evidence that it did help toward this end. Not only did the overall level of seam/nonseam transitions drop somewhat, but examination of the calendars shows that there were numerous instances where the calendar facilitated longitudinal editing and correction of data (either in the current wave or a prior one), thus eliminating false transitions which could have resulted. An unanswered question is what effect (if any) the calendar may have had on cross-sectional data. The calendar introduces a much higher level of dependent interviewing than has been previously used in the survey. If the initial report of programs and activities are correct, this dependency may improve data in both the cross-sectional and longitudinal contexts.

Although large numbers of modifications in reports did not occur with the calendar, many of those that did happen were on calendars where other events were also occurring. Cases such as these, that is, those participating in the programs and events, are the essence of the data being collected. It is important to remember that only a small percentage of all persons have any events to misdate in the first place. Of the 1918 calendars, 1268 (66%) not only had no transitions, but had no report at all of any income source code (codes 1-56) during any of the three waves. (This should not be interpreted to mean there was no income--wages and salary are listed separately from the income source codes. The point is that for many individuals, wages and salary are the only source of income--they receive no income from any program.) No evidence exists to suggest that the calendar was rejected by either respondents or the Field staff; in fact, virtually all non-neutral comments about the calendar were positive. Field staff experiences with the calendar clearly showed that it was not used actively enough to have much of an impact; for this reason, the implementation in the 1990 panel (again in the Chicago region only), places greater emphasis on using the calendar at points in the interview where key date-related activities and programs are discussed. Hopefully, this higher level of integration will work to provide better longitudinal data, not merely in the dating of events, but in all aspects of quality.

This paper represents the start of research on the calendar; more analysis on the effectiveness and best role for the calendar is necessary. Statistical comparison of the calendar data to data from interviews collected at the same time may provide a more exact test of the calendars' impact. Also, the need to consider the calendar as more than just an aid becomes more important as the SIPP approaches its 1995 redesign. Would a calendar used as a data collection instrument (as opposed to an aid) represent a substantial improvement to the survey? One possibility is that the 1989 and 1990 tests may act as prologue to a more extensive test; at a national level, as the primary data collection device, or both, sometime in the next few years.

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