The Life History Calendar: A Technique for Collecting Retrospective Data

Deborah Freedman, Arland Thornton, Donald Camburn, Duane Alwin and Linda Young-DeMarco*

This paper details the authors' selection, design, and use of a life history calendar (LHC) to collect retrospective life course data. A sample of nine hundred 23-year-olds, originally interviewed in 1980, were asked about the incidence and timing of various life events in the nine years since their 15th

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*The University of Michigan
birthday. The accuracy of the LHC retrospective data can be tested by comparing the 1980 reports about current activities with the 1985 LHC retrospective reports about those same activities during the 1980 interview month. The following aspects of the LHC are described: (a) the concept, uses, and advantages of the LHC, (b) the time units and domains used, (c) the mode of recording the responses and the decisions and problems involved, (d) interviewer training, and (e) coding. The following results attest to the accuracy of the LHC retrospective data: (a) only four of the calendars had missing data in any month; (b) the data obtained in 1980 about current work, school attendance, marriage, and children showed a remarkable correspondence to the retrospective 1985 LHC reports of these events; (c) the interviewers were positive about the LHC’s ability to increase respondent recall.

Social scientists have become increasingly interested in the processes that underlie patterns of development, growth, and change in individuals’ lives. Investigations of the dynamics of human behavior are greatly facilitated by explicitly incorporating the timing and sequencing of life course events into the research design and analysis (Marini 1984; Modell, Furstenberg, and Hershberg 1976; Modell, Furstenberg, and Strong 1978; Winsborough 1978). Of course, the life course is not a unidimensional series of events unfolding and evolving over time but a simultaneous unfolding of many dimensions, all interwoven temporally and causally in complex ways (Felmlee 1984; Goldscheider and DaVanzo 1985; Waite and Spitze 1981; Lauro 1979). The development of new and sophisticated statistical methods has facilitated and stimulated empirical estimations of dynamic causal interrelationships among various aspects of the life course (Allison 1984; Tuma and Hannan 1984).

These theoretical and statistical developments have generated a need for high-quality information about many of the activities and events that occur over significant and lengthy periods of the life course. Unfortunately, meeting these data requirements can be difficult, time consuming, and expensive.

One technique for obtaining appropriate timing data uses a continuous registration system in which all relevant activities and events are constantly reported to a statistical agency and assembled for the researcher’s use. Another measurement approach utilizes the panel study, which follows and interviews the same individuals over time. However, both of these techniques are expensive and must extend over
A considerable time period. In addition, unless the details of events and activities between interviews are collected retrospectively at each interview, the traditional panel study provides only multiple snapshots of individual lives.

A less expensive approach utilizes the standard cross-sectional survey to obtain retrospective information for substantial periods of the life course. This approach is limited by the well-known difficulties of obtaining reliable information retrospectively, but researchers have experimented with ways to improve the quality of retrospective data. The life history calendar (LHC) is one such tool. This paper describes the efforts of one study to utilize and refine this approach to data collection. One important advantage of this study is that it is embedded within a panel study. Thus, we can evaluate the extent to which the retrospective reports about particular events obtained with the LHC differ from the reports obtained when those events actually occurred.

In 1985, we used an LHC in the seventh wave of a panel study to obtain information from a group of young adults, each 23 years old, about the incidence and timing of various life events in the nine years since their 15th birthday. The panel study, of which the 1985 interview is the most recent phase, was begun in 1962 with interviews of the mothers of these young adults shortly after their birth. The young adults themselves were first interviewed in 1980, when they were 18.

The principal reason for using an LHC is the belief that it can improve recall by increasing the respondents' ability to place different activities within the same time frame. On a questionnaire mailed after the fieldwork, almost all the study interviewers stated that they thought the LHC improved respondent recall. A comparison of the 1985 LHC retrospective reports of specific activities and events that occurred in the 1980 interview month with the 1980 reports of those activities attests to the relative accuracy of the data collected with such a calendar. However, the use of this technique is not completely straightforward and has some potential pitfalls. Our purpose in describing our experience is to help prospective users in applying this technique and in deciding when its use is appropriate.

First, we define the LHC, note examples of its use by others, and detail its advantages. Then, we describe our experience with an LHC, beginning with our deliberations about its suitability for our purpose and continuing through the processes of calendar design, interviewer
training, fieldwork, and data coding. Finally, we present some findings on the accuracy of the data collected with our LHC.

1. COLLECTING TIME-LINKED RETROSPECTIVE DATA

Information about activities across time has been collected in a number of different ways. For example, time-use studies frequently use a diary approach to record activities in a particular time period. Either the interviewer or the respondent records sequentially the time spent on each activity over the period in question (Juster and Stafford 1985).

Many studies, using a more conventional interview format, have incorporated a chart at an appropriate place within the corpus of the questionnaire to record the details of birth, marriage, work, or migration history. This is a convenient way to record a sequence of events, and the data are easier to code than data recorded in the usual question-response format.

An LHC is usually a separate document that, in essence, amalgamates the charts for a number of different event histories. An important advantage of the LHC is that it enables the researcher to relate and cross-check the timing of events across several different domains. The calendar format is usually a large grid. One dimension of the matrix details the behavioral patterns being investigated; the other dimension is divided into the time units for which these behavior patterns are to be recorded. The interviewer fills in the cells of the matrix with information provided by the respondent.

The earliest example we found of the use of an LHC was in a study done in Monterrey, Mexico, in 1967 (Balan et al. 1969). A full-scale national sample study in the U.S. in 1969 also used this technique (Blum, Karweit, and Sørensen 1969). The LHC has been used more frequently in recent years because of increased research interest in the analysis of life course events and the development of more sophisticated methods for analyzing life course data (Tuma and Hannan 1984).

Various kinds of data have been collected with an LHC. The 1969 national study cited above used an LHC to record the timing of education, employment, and family events and other information about these activities for a study of racial differences. One current study (Mason 1986) uses an LHC to obtain time-specific data on child
A technique for collecting retrospective data

A 1983 survey in Baltimore (Furstenberg, Brooks-Gunn, and Morgan 1987) used a calendar to record the timing of marriage, cohabitation, pregnancies, schooling, employment, and receipt of welfare over an 18-year period. Another recent survey (Kessler 1985) used an LHC to record the timing of spells of depression and the timing of other events that might trigger or exacerbate such spells. A recent study of Soviet emigres (Anderson and Silver 1986) examined the timing of work and migration in the life course.

2. ADVANTAGES OF AN LHC

A life history calendar can have two main advantages for collecting retrospective survey data. First, it can improve the quality of the retrospective data by helping the respondent to relate, both visually and mentally, the timing of several kinds of events. Events more readily remembered, such as marriages, births, and changes in geographical residence, provide important reference points for recalling less salient events, such as details of employment and living arrangements. The calendar display calls to the attention of both respondents and interviewers any inconsistencies in the timing of events between different domains. The respondents can then utilize the full pattern of their recorded life events to recall the timing of past events more accurately.

Second, very detailed sequences of events are easier to record with an LHC than with a conventional questionnaire. For example, recording monthly sequences over a period of years of the many forms of living arrangements for respondents who frequently change these arrangements would be quite complicated with a conventional questionnaire. It would require ascertaining and recording the beginning and ending dates of many short time intervals spent in each of the forms of living arrangements for which information was needed. With a calendar, the recording can be done graphically with much less difficulty, using symbols to mark the beginning and ending months and connecting them with lines to indicate continued activity.

Of course, the paramount issue in deciding whether to use an LHC is how accurately it will elicit information from the respondent. However, other considerations in adopting an LHC are also important: i.e., special coding problems, the detection and resolution of data
inconsistencies, the construction of variables for analysis from detailed data, and possible additional costs. As with any complex data collection process, the advantages of the LHC are best realized if the overall plan includes careful prior consideration of how the data will be processed and used in analysis.

3. DESIGNING AND USING AN LHC

Our experience with an LHC, in the seventh wave of a panel study, involved a sample of approximately 900 young adults, each 23 years old at the time of the interview. This study began in 1962 with personal interviews with a sample of mothers living in the Detroit metropolitan area, each of whom had borne a child in July 1961 (Freedman, Thornton, and Camburn 1980; Thornton, Freedman, and Camburn 1982). The sample was divided equally between mothers for whom this birth was the first, second, or fourth. These mothers have now been interviewed six additional times by telephone. Initially, the primary focus of the study was fertility behavior, but a large body of data about many other aspects of the family was also collected, both in the initial interview and in subsequent interviews.

In 1980, the study was expanded to include personal interviews with the children whose birth made the mothers eligible for the original study (Thornton et al. 1982). Each of these children was then 18 years old. This young adult sample was interviewed again in 1985.

Over the 23 years of the study, we have retained most of our respondents. In the initial wave of the study in 1962, we completed interviews with 92 percent of the target sample of mothers. In the 1985 study, we still had 86 percent of the initial sample of mothers and 85 percent of the children born in 1961. Analysis of the small number of cases lost shows that respondent loss produced no important biases.

In the 1985 interview, an LHC was used to obtain information on various aspects of the lives of the 23-year-olds in the period since they turned 15. Our main interest was the process by which adolescents mature into adults, specifically the sequence and timing of schooling, leaving the parental home, entering the job market, and forming families. We obtained information on each of these life aspects for every month of the nine-year period between ages 15 and 23.

A truncated and reduced version of our LHC is shown in Figure 1. The vertical axis of the calendar displays the various life domains
FIGURE 1. Life History Calendar.

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covered and the categories of interest within each domain. The horizontal axis includes all the months for the years these young adult respondents were between the ages of 15 and 23. This version of the calendar is the culmination of a long experimental process in which we selected the variables recorded on the LHC, experimented with the format, and pretested several versions. In constructing this calendar, we resolved several problems: the choice of time units, the specification of domains, the recording of responses, the integration of the LHC into the total interview format, and calendar design.

3.1. Choosing the Time Units

The time unit used in the calendar—day, week, month, or year—depends primarily on the data needs of the research. The investigator must choose a time unit that is small enough to ascertain with adequate precision the sequence and temporal interrelation of events. To record events that occur fairly frequently or quite close together, it is necessary to divide time rather finely. At the same time, one must consider the respondents’ ability to make fine time distinctions and the feasibility of fitting the desired time unit over the required time span of the study onto a calendar of manageable size.

We used a period of one month as the unit of time. This precluded distinguishing transitions within months but still produced a fairly large calendar with only a small recording space for each time unit.

3.2. Specifying the Domains

The substantive domains selected for the LHC reflect the research aims of the study. Because the LHC is designed to obtain a large amount of information about the timing of activities and transitions across many time units, the substantive areas of study must be limited in number and precisely defined. The constraints of respondent time and rapport also mandate the inclusion of only the most salient aspects of each life domain. Our calendar focused on geographical residence, marital and cohabitation statuses and transitions, fertility, living arrangements, school enrollment, employment, military service, and financial interchanges between respondents and their parents.
Variables with different levels of measurement—categorical, ordinal, and interval—can be handled in an LHC. However, the level of measurement significantly influences the design of the calendar and the type of information recorded. For example, on the calendar in Figure 1, B1 (geographical residence) is a categorical variable that can include a multitude of possible locations. For marriage and cohabitation (B3 and B4), categorical variables were entered to record the events that precipitate or alter these states. In each case a separate line was provided to record, in a simple dichotomy, whether or not the respondent was living with a spouse or partner. Each childbirth (B5) and that child’s residence pattern with the respondent were entered on a separate line. A series of dichotomous variables (B7–B12) records whether or not the respondent was living in various other arrangements. Most of the living arrangements (B3–B12) are not mutually exclusive, since respondents could live with several different types of people at the same time.

Interval-level variables are used to record school enrollment, employment, and financial interchanges with relatives; categories are grouped for ease of response. The categories for both school enrollment (B13) and employment (B14) are meant to be mutually exclusive as well as exhaustive. For financial interchanges (B16 and B24), only annual information was deemed feasible, so the year serves as the referent unit.

3.3. Recording the Responses

To study life course events, the researcher must ascertain the “state” of each activity in each time unit, mark the transitions between states, and identify successive “spells” of each activity. For some activities, it can be useful to document the specific type of event that produced the transition from one state to another. For example, one can identify the marital event that precipitated the move from living with a spouse to not living with a spouse: separation for marital discord, separation for other reasons, divorce, or death of spouse.

The mode of recording reflects the type of variable or domain being considered. To record time spent in an activity, we entered an $X$ in the month the activity began, drew a line extending through the period in which the activity continued, and entered another $X$ in the
month the activity ended, as illustrated in Figure 2. An activity had to continue for at least one month to be recorded in the calendar. An activity that filled an entire month but did not extend into another month was indicated by a circled $X$ in the month of the activity (panel A). When a respondent made a transition from one category to another within a month, the ending of the first spell and the beginning of the next spell were marked in the same month (panel B). However, when the transition occurred at the juncture of two months, the ending of the first spell and the beginning of the second spell were marked in adjacent months (panel C). Thus, the calendar indicates whether specific activities began, continued, ended, or did not occur in each time unit. Figure 3 illustrates the recording mode for detailing the respondent's living arrangements. The categories are not mutually exclusive, since a respondent could have lived with several persons, related to the respondent in different ways, at the same time. This example illustrates the recording of overlapping residence for a respondent who spent some periods living with varying combinations of parents, spouse, and children.

Figure 4 shows how we recorded information about a categorical variable when the universe of possible categories was so numerous that they could not possibly be precoded. The first and fourth rows of the set were used to write in the actual names of cities and states, and the second and third rows were used to define the periods the respondent was living in the specified locations. The multiple-row structure was chosen to allow ample room for interviewers to clearly write in the

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1 Figures 2–6 illustrate the mode of recording. Persons desiring more detailed information about the recording procedures can write the authors for a copy of the LHC instructions.

2 Other versions of LHCs provide a single box for each year rather than demarcating the months. They attempt to provide enough space in the box to record the date that each transition occurred.
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FIGURE 3. Recording living with several kinds of persons.

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locations associated with each time period. One could use a similar structure to describe occupations or industries with categories too numerous to precode or to record the precise magnitude of such interval-level variables as earnings, housing costs, and number of hours worked.

Although it is possible and sometimes advantageous to record detailed information about various activities on an LHC, it can also be disadvantageous. The limited space allotted for each time unit on most calendars makes it difficult to record the information in readable form. But a greater limitation is that recording such information on the LHC can make it more difficult to quickly check the consistency of timing data across domains. As Figures 2–5 show, the mode of recording timing data with X’s and lines provides a clear picture of time spent in each activity. Recording detailed information between those lines could limit the value of the calendar as a visual device for recalling information and detecting inconsistencies. Calendar entries on the timing of life course events are useful for detecting inconsistencies only if the respondent and interviewer can read them quickly and easily.

FIGURE 4. Recording places of residence.
There are ways to enter detailed information about particular activities on an LHC without decreasing the usefulness of the calendar format for detecting inconsistencies. For example, one could record occupation and industry data for each segment of the employment history on the last lines of the calendar, preferably right below the employment line, and not impede the interviewer’s ability to check for inconsistencies within the body of the calendar. When the calendar space is inadequate for recording the detail needed for occupation and industry, each job segment could be numbered on the calendar and the interviewer could record the needed information about each segment in the main body of the questionnaire.

Our LHC provides an example of how one can record detailed descriptions on an LHC without impairing the calendar’s usefulness for detecting inconsistencies. The geographic lines at the top of the calendar require detailed descriptions, but their placement outside the main body of the timing lines preserves the usefulness of the calendar for resolving inconsistencies.

The marriage lines were used to record information about marital states (Figure 5). The initiation and resumption of each marriage were recorded on the marital events row, and a number was used to identify the spouse as the first, second, etc. Each spouse retained his or her own specific identifying number for any reconciliation or remarriage to the same person. Interruptions in a marriage were identified as separations due to estrangement (S) or absences for other reasons (A); divorces were coded with a D and widowhood with a W. These codes were inserted in the marital events line of B3. On the following line, labeled “living with spouse,” X’s and lines were used to denote periods of marital cohabitation.

A similar set of codes and procedures was used to record cohabitation without marriage (B4). The first row, “partner/lover,” identified transitions into and out of cohabiting unions using the marital coding scheme. Marital and nonmarital cohabiting partners

FIGURE 5. Recording marriage and cohabitation.
were linked by assigning the appropriate spousal number to a cohabiting partner whom the respondent later married. Cohabiting partners whom the respondent did not marry were assigned numbers following those used for spouses. For never-married respondents, all cohabiting sequences were entered in order and the partners were numbered accordingly.

Figure 5 illustrates the entries made in the marriage and cohabitation lines for a respondent who married in June 1981, lived apart from her husband from September to November 1981 when he had a job elsewhere, became estranged in July 1982, and divorced in September. She married a different person in January 1983, was widowed in April 1984, and remarried her first husband in December 1984. The events are recorded in the first line of B3, and the periods in which she actually lived with her spouse are recorded in the next row. Line B4 shows that she began cohabiting with her first husband in April 1981 and continued so until she married him in June 1981. In June 1984, she moved in with her first husband again, left because of a quarrel in August 1984, joined him again in October, and then cohabited with him until their remarriage in December 1984. She had cohabited with another man, whom she never married, from July 1980 until September 1980, when they separated.

For school enrollment and employment, only timing data were entered, using the system of X’s and lines. The categories in these two domains were designed to be mutually exclusive and exhaustive. However, a person who switched between categories in one month would have entries in two different categories for that month.

The categories for financial interchanges were precoded so that the interviewer could check the appropriate calendar box, exactly as in a standard interview format.

3.4. Integrating the LHC into the Total Interview Format

There are a number of different ways to integrate an LHC into the total interview format. The LHC could comprise the first part of the interview, and the more usual questionnaire format could be used to obtain the desired additional information. Alternatively, a researcher might choose to alternate the LHC questions about timing in each domain with a set of questions in the usual questionnaire format to obtain additional information about the activities in that domain. We
know of no empirical studies of the optimal way to integrate an LHC into a conventional interview format.

Interposing noncalendar questions from the other part of the questionnaire between portions of the calendar interview has some advantages. First, questions in the questionnaire can build on the timing sequences obtained in a particular calendar domain. The placement of these questions right after the calendar questions on that subject could make for greater consistency and avoid the repetition of some timing questions. Second, asking a set of related questions may clarify for the respondent the definition and inclusiveness of the concepts in the calendar.

The combination of formats also has disadvantages. Alternating between the LHC and other types of questions could confuse the respondent and decrease rapport. Moreover, interrupting the flow of the LHC could decrease its effectiveness as an aid to the respondent in recalling the timing of activities and in detecting inconsistencies between entries in the various domains.

In our survey, which separated the LHC completely from the other sections of the questionnaire, we had excellent rapport and believe we obtained good data. We do not know whether rapport or data quality would have suffered from an alternate strategy. Other studies have almost fully integrated the calendar into the other part of the questionnaire, shifting continuously between the two interviewing modes (Furstenberg et al. 1987).

3.5. Designing the LHC

Several elements of calendar design and format can facilitate the recording and checking of entries in the LHC.

1. The various domains and the categories within domains should be separated with prominent lines or spaces to keep the categories distinct across the span of the calendar. Our calendar, in addition to leaving blank spaces between the domains, printed the name of the item to be recorded several times along the line in a very faint underlay of blue letters to help the interviewer identify the correct line for entering a particular data item.

2. The organization of the domains in the LHC, indicated in the vertical stub of our calendar, can provide a framework for the interviewing process. Interviewers were told to inquire about all life events
of one kind before proceeding to the next domain. This gave a uniformity to the interviewing process and minimized the likelihood of omitted items. The stub also contained screening devices to simplify the interviewing. For life aspects not universally experienced, a screening question first ascertained whether or not an event occurred in the life of each respondent, and this was recorded in the small boxes provided in the stub. For example, our interviewers asked if the respondent had been married (and how often), had children (number and sex), and had experienced various kinds of living arrangements. The screening responses routed the interview around nonapplicable questions and showed the coders whether the absence of contingent entries stemmed from interviewer oversight.

3. Time intervals should be well demarcated. Following a category within a domain across the time span and entering the events in the correct months can be difficult, so we repeated the labels for the years and months at several intervals down the length of the calendar to help the interviewer and the coder clearly identify the space reserved for each time period. Alternating the background color of the columns for adjacent years helped the interviewer and respondent identify the correct year.

Since all our LHC respondents were born in the same month and year, we could easily print the correct calendar and respondent age labels on the appropriate calendar columns. This provided helpful temporal orientation for our respondents, enabling them to easily identify a particular year and their age status in that year. For varied age samples, the calendar would have to be adapted at the time of the interview by inserting the appropriate age and calendar year labels for each respondent.

Our pretest provided some experience with handling a group of respondents of varying ages. If we obtained the respondent’s birth date when the interview was scheduled, we prepared a personalized calendar for that respondent by writing in the correct age and calendar year labels. If this was not possible, we used the first few minutes of the interview time to write in the identifying age and date labels. Another solution would be to provide a sticky tape printed with the calendar years; this could be attached at the time of the interview to identify the calendar years corresponding to the ages of the respondent.

4. The interviewers should be able to easily correct entries as they or the respondents identify inconsistencies across domains. The
calendar should be printed on paper that can withstand frequent erasures, and the writing instrument should produce legible but easily erasable entries.³

5. Finally, an attractive professional-appearing calendar can improve respondent rapport and foster greater interest among the interviewers.

4. THE STRUCTURE OF THE LHC INTERVIEW

The potential of the LHC for improving recall can be affected by both the format of the interview and the structure of the questions. There has been considerable variation across studies using LHCs in the degree of structure in both interview format and question style. In one relatively unstructured three-country migration study (Hawley 1984; McDevitt et al. 1986), the interviewers were given an LHC grid containing the domains and time periods and were instructed to fill in the wanted events in the grid. The order and nature of the questions asked were left up to the interviewer.

Another study used a somewhat more structured format: The interviewer was instructed to use one area of the LHC as a focus and to record the changes over time in that area; then, they were to relate those changes to changes in the other areas (Smith and Karim 1980; Fricke, Syed, and Smith 1986). The choice of the initial focus depended on the respondent’s particular history and life cycle stage. The interviewer was directed to shift to a different focus when the timing of those events became more central. Examples of the kinds of questions to be used in the interview were provided in the instruction booklet, but no specific question sets were mandated.

A study done in 1983 by Furstenberg used a completely structured interview with specified questions (see Furstenberg et al. 1987). All the LHC questions were incorporated into the main questionnaire document, and the answers for certain sets of those questions were recorded on the LHC.

Our LHC used a fairly structured format with an initial mandated question (or two) for each domain. The interviewer introduced the LHC by saying, “Now I would like to ask you about some of

³ We used an erasable pen, which provided the legibility of an inked line but enabled interviewers to erase during the interview and even several hours later.
A TECHNIQUE FOR COLLECTING RETROSPECTIVE DATA

the important things you have been doing since you were 15. To help record this information, I am going to use this calendar." Then the interviewer explained the LHC to the respondents so they could understand its layout and use it as an aid in reporting information. The instruction manual suggested the following explanation as a guide: "As you can see, we have the years going across the top; they begin in July 1976, on your birthday, and extend to the present. For those years, I will be asking you about the things listed along the side here—where you lived and whom you lived with, any marriages, any children you may have had, schools you may have attended, and when you were employed."

The interviewer was instructed to begin with questions about the first activity line (the respondent’s geographic residence), follow that over the total time period, and then ask in turn the needed questions for each set of activities listed in the stub of the calendar. The initial questions for each activity were incorporated in the questionnaire and were asked precisely as they were written. For example, the interviewer started with B1 and asked, "Let’s begin by talking about where you lived during those years. In what city and state were you living when you turned 15.” When that was recorded she asked, “Until what month and year did you live there?” If the respondent’s residence had changed, the interviewer asked, “Where did you live next?” These two questions were asked until geographic residence was established for the entire period.

The interviewer then asked about marital events, beginning with the question, “Have you ever been married?” and then using the probing questions to obtain all the needed information about any marriages. Each activity line was completely finished before the next line was started, and the entire calendar was completed in the order shown in the vertical stub.

A series of probes was mandated for each activity, but these were not incorporated in the questionnaire. Instead, the interviewers were asked to memorize the probes needed to follow up the introductory questions for each activity. (The probes were also printed on 5 × 8 cards for reference during the interview, if necessary.) This procedure had some costs, since it required substantial memorization ability and since there was some danger of changes in the language of the probes over time. However, including the probes in the formal questionnaire would also have had substantial costs, since it would have required a
fairly complicated and lengthy series of skip patterns to sort out those probing questions relevant for each respondent’s particular life pattern in each activity.

The probes for cohabitation illustrate this dilemma. The opening question about cohabitation, the one printed on the questionnaire, is, “Have you ever lived together as a partner in an intimate relationship with a (man/woman) without being married to (him/her)?” For all ever-married respondents, the probes are as follows:

1. Did you live together with your (first, etc.) (husband/wife) before you married (him/her)?
2. When did you and your (first, etc.) (husband/wife) start living together?
3. Did you and your (first, etc.) (husband/wife) live together continuously until you were married, or did you live apart for a month or more because you were not getting along or for some other reason?
4. Was this because of difficulty in your relationship or for some other reason?
5. When did this happen?
6. Did you and your (first, etc.) (husband/wife) live together again before you married (him/her)?
7. Was there any other (man/woman) you lived together with as a partner in an intimate relationship without being married to (him/her)?
8. In what month and year was the (first/next) other time you lived with a (man/woman) without being married?
9. When did you and your partner stop living together for any reason after that?
10. Was there any other (man/woman) you lived together with as a partner in an intimate relationship without being married to (him/her)?

A similar series of probes was provided for respondents who never married.

The length and complexity of this set of probes demonstrates the conflict between maintaining the precise language of the probes and preserving the ease of the interviewing process. Incorporating in the questionnaire all the probes needed to determine those cohabitation
periods involving a spouse and the extent and nature of all possible breaks and resumptions in each cohabitation spell would require a lengthy and complicated questionnaire that could impede the interviewing process, a cost that must be weighed against the possible gain in probing accuracy.

5. INTERVIEWER TRAINING

Our LHC instrument necessitated more intensive interviewer training than was needed for the previous waves of this study, which did not use an LHC. We used only experienced interviewers, each of whom had participated in previous field studies and had received the initial week of training given all newly recruited interviewers at Michigan's Survey Research Center. Still, the training for our specific study required six days in all, an initial five-day session and one review session after the interviewing began. This is triple the training time used for experienced interviewers in the previous waves of our study.

The training began with an explanation of the layout and structure of the calendar. Next, a script of a life story and a filled-in calendar recording the life events in the story were used to explain how to record those events. Then, the research director conducted a detailed mock-up interview, filling in the appropriate entries for the responses on a projection screen on transparencies that replicated the calendar pages. The interviewers next practiced interviewing with prepared life scripts, taking turns at being the respondent. The trainers observed and corrected their technique and reviewed the accuracy of their completed calendars.

Training the interviewers to use the probes effectively was particularly difficult. The trainers had to demonstrate proper probing techniques frequently and had to show how departures from the proscribed probing method could result in errors and faulty data. Another problem was that interviewers sometimes did not adequately simulate respondents in practice sessions. They tended to provide the correct information to their partner even when the probing was inadequate, thus impeding the mastery of the probes.

One week after the interviewing began, the research staff held an additional day of training to detect and resolve problems. The staff personally edited the interview schedules, and individual conferences were scheduled with interviewers as problems surfaced.
There are special logistical problems in conducting an interview with an LHC. First, there is one more document to manage. Second, the desired facilities for an LHC interview, a table and chairs enabling the respondent and interviewer to sit side by side and view the total calendar, were sometimes lacking. Each interviewer was given a clip board of calendar size to serve as an alternative writing surface and to facilitate sharing the calendar with the respondent. Unfortunately, the clip board for our large calendar (12’’ × 25’’) was awkward for the interviewers to carry. A smaller calendar would have fit more easily into a briefcase, but it would have been less useful for recording.

When possible, the LHCs were administered in personal interviews. However, respondents who lived outside of our travel range were interviewed by phone; local interviewers were not recruited. Given the complexity of the LHC, we felt that data obtained over the phone by our well-trained interviewers would be better than data obtained in a personal interview by someone who had not participated in our training sessions. Telephone interviews do lack the visual advantage that the LHC provides for the respondent in a personal interview. However, the interviewer can still utilize the calendar to detect discrepancies and provide feedback to the respondent about possible inconsistencies. The respondent, once aware of these errors, can usually reconstruct the proper sequences of events. In this way, the interviewer can use the full spectrum of the calendar to help the respondent relate past events more accurately.

A calendar as long and complex as the one used in our study would not be a feasible instrument for a mail questionnaire. However, a study using a simpler LHC might well use the mails for respondents who cannot be reached otherwise.

7. EDITING THE LHC

A large part of the editing process took place during the interview. The interviewers were trained to check the finished calendar to detect various kinds of inconsistencies and to resolve them with the respondent. An interviewer would typically say, “I seem to have recorded something wrong. Can you help me straighten it out?” Some
examples of such inconsistencies are as follows:

1. The status of the respondent in each activity had to be recorded in every month of the LHC. Any months in which there were no entries for these items had to be identified and resolved with the respondent.

2. The "lived with whom" category required careful editing. Although a respondent could be living with several different types of individuals (parent, other relatives, and spouse) at the same time, some combinations were not possible. A respondent could not live with both mother and father (B7) and at the same time with just mother or just father (B7a, B7b). A respondent could not live alone and be simultaneously living with anyone else. Residence with a spouse required a marital event.

3. All filter questions in the calendar stub had to be answered, and the responses had to match the recorded experiences.

4. A respondent could not simultaneously be recorded in more than one category of schooling or work, although a transition between categories was correctly recorded with an $X$ in each month of the transition.

The next stage in the editing process was done by the coders, who edited each calendar before the actual coding. A significant minority of the interviews were also check edited by the research director. The coders were given a list of editing instructions noting possible discrepancies and distinguishing between those discrepancies that the coders could resolve and those that had to be resolved by the research director.

Some examples of ambiguities that the coders could resolve include the following:

1. When a transition between two categories of an activity had been recorded properly with $X$'s but one line had not been drawn, coders could draw the missing activity line.

2. When the number of marriages was left blank but the marriages were all recorded properly on the line, the number box could be filled in accordingly.
3. All entries on the residual "other" line in the "living with whom" category were reviewed for possible reclassification. Some reclassifications, such as changing stepmother to the "other relative" line or changing friend to the "housemate" line, could be handled by the coder. Any doubtful cases were to be referred to the research director.

We did not record the number of calendars with ambiguous information requiring resolution by the research director, but our perception is that there were few. A number of ambiguities involved the "living with whom" domain: The residual category "other" was initially used for kibbutz or commune living, living with a family as a personal aid, and living with a boy friend's relatives or the parents of an ex-fiancée. The individuals in these situations were all changed to "housemates."

The small number of substantive editing problems and the relatively minor problems detected in the editing process indicate the high quality of the data obtained with the LHC. The entire editing process, of course, was confined solely to the 1985 data; we did not use any of the 1980 data.

8. CODING THE DATA

An LHC is more difficult and expensive to code than a conventional questionnaire because it usually involves fairly detailed entries. The large number of data points needed to code the various activities makes the coding process both lengthy and difficult. For example, our calendar generated about 3,100 variables (114 data points for each of 27 different activities). The desirability of 100 percent check coding to ensure accuracy also adds to the expense. Because many of the various life course activities are interrelated, coding errors in one activity line can create a discrepancy within a related activity.

The timing data could have been coded in several ways. We chose to code the "state" of each activity in each month—i.e., whether or not that activity was engaged in during that time period. Alternatively, we could have coded only beginning and ending months, which would define a spell of activity, and the intervening states could have been filled in later on the data tape.
To code our study, we entered the calendar data directly onto the computer using a direct data entry program. A single line of the calendar, complete with labels for months and years, was displayed on the computer screen. The line was broken into three segments, because the width of the computer screen could not accommodate the entire line. For each item, the coders entered a 1 in each month to indicate participation or a 0 to indicate nonparticipation. This produced a coded line with a format very much like the actual filled-in calendar line. We thought this would foster coding accuracy.

In retrospect, this coding scheme created some problems. In domains in which categories were not mutually exclusive, it failed to identify unique beginnings and endings of all spells. Figure 6 illustrates the recording of two situations: In panel A, a spouse joined the respondent in the parental household one month and moved out the next; in panel B, the respondent moved from the parental home into a spousal household one month and then moved back the next. The

4 Each activity line was coded separately. Therefore, if two similar events took place in the same month, such as living with both mother and spouse, each event was coded in that month on its own line. The categories of schooling and work are mutually exclusive. Therefore, only in a month of transition between categories in those domains could there be an entry in the same month in two of the lines, denoting the end of one level of an activity and the beginning of a different level.
recording mode clearly distinguishes these two different situations, but the coding procedure (see Figure 7) made them indistinguishable. This difficulty necessitated a lengthy recoding during the data tape preparation. This could have been avoided by coding only the beginning and ending months of each spell.

Our coding supervisor thought that coding the state of each activity in every month compounded the usual problems of boredom and inaccuracy associated with coding routines. Although the years and months were printed above each segment, the coders sometimes lost their place or, when entering a long line of zeros or ones, held the key down too long or not long enough. The supervisor noted that "after a while, all the little squares seemed to run together." She concluded that coding only the beginning and ending months of each spell of activity might have mitigated this problem.

9. MANAGING THE DATA

A life history calendar can produce a rich set of variables for the analysis of life course events, but managing the data set can be costly. The costs stem primarily from the nature of the data set and the uses for which it is designed. The extensive set of timing variables that can be constructed from the data collected in an LHC expands the research possibilities but can also increase the data management costs. The incidence and timing of each activity is different for each individual; therefore, to construct variables for the inception, span, termination, and interrelationship of the various activities, the researcher must search through the LHC events on the data tape for each individual to locate the relevant items. This is a time-consuming and costly procedure. Constructing the timing variables for studying life course events can be quite complicated, and few ready-made programs are available for this task. Each new variable will probably require a fairly large input of programming time, and a number of programs will probably need to be revised and tested before they can accomplish the desired task.

10. THE RELIABILITY OF THE LHC DATA

The data obtained with our LHC appear to be quite reliable. Although we have no tests of the validity or accuracy of the data, we have some evidence, detailed below, of their reliability.
1. Among the approximately 900 LHCs collected and processed in the study, there are only four in the final data set that have months with no data.

2. The data collected retrospectively with the LHC in 1985 concerning events in the 1980 interview month correspond highly with the data collected at the time of the event in 1980. Such comparisons between 1980 and 1985 data are available for the following items: whether the respondent had ever been married at the time of the 1980 interview, and the month and year of such marriages; the incidence and dates of births up to the 1980 interview; and work and school attendance in the 1980 interview month.

3. The match between the 1985 and 1980 data is not affected by the 1985 interview mode. There is no discernable difference between the data collected by telephone in 1985 and the data collected by personal interview.

10.1. Marital and Birth Events

The incidence and timing of the births and marriages reported in 1980 correspond highly with the retrospective reports of these events in 1985. In the 1980 interviews, 28 respondents reported that they had been married; in the 1985 interviews, 26 of these individuals reported the same marriage dates they reported in 1980. The reports of the other two differed by one and three months respectively. In 1980, 855 respondents reported that they had never been married. In the 1985 calendar, 852 of these respondents again reported that they had not been married by 1980. Of the remaining three cases, two reported that they married in the 1980 interview month (and thus did not necessarily give discrepant reports), and one reported that she/he married in the month before the 1980 interview.

To facilitate comparison, we tried to duplicate the phrasing of the 1980 questions in the 1985 questions. However, the technical differences between the LHC and the standard questionnaire created some small differences in the questions for schooling and work. In 1980, respondents were asked about current work and schooling, but they were not asked to specify how long activities had lasted. In the 1985 interview, schooling or work activity in the 1980 interview month was recorded only if it had occurred during that month (though it did not have to fill the entire month) and only if it had lasted at least one month. Copies of the exact questions used in the two surveys for the compared items can be obtained from the authors.
Only ten of the ever-married respondents reported a birth in 1980. For nine of these respondents, the 1980 and 1985 month and year reports matched exactly; the discrepant report erred by only one month.

10.2. School Attendance

Table 1 shows the respondents’ reports of their 1980 school attendance in the 1980 interview and in the 1985 LHC. This table shows the aggregate distributions of students who attended part time, full time, and not at all during the 1980 interview month, as measured in 1980 and 1985. The responses are remarkably consistent between the two interviews.

The cross-tabulations of the 1980 and 1985 responses reported in Table 2 again show a considerable degree of consistency between the interviews; 87 percent of the respondents (694 out of 797) gave identical answers about school attendance in both interviews. (In each schooling category column, the number of respondents who gave identical answers is circled.) When we restrict our comparison to those who attended school and those who did not, we find that 91 percent of the respondents gave the same answers in 1980 and 1985.

There appears to be no directional bias towards reporting school attendance: Those who attended full time in 1980 were just as likely (about 7 percent) to report in 1985 that they did not attend full time as

<table>
<thead>
<tr>
<th></th>
<th>1980</th>
<th>1985</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Full-time attendance</td>
<td>385</td>
<td>48</td>
</tr>
<tr>
<td>Part-time attendance</td>
<td>67</td>
<td>9</td>
</tr>
<tr>
<td>No attendance</td>
<td>345</td>
<td>43</td>
</tr>
<tr>
<td>Total</td>
<td>797</td>
<td>100</td>
</tr>
</tbody>
</table>

*Note.* This analysis excludes the 85 respondents who said in 1980 that they were in high school, since these respondents were not asked whether they attended full or part time. In 1985, 75 of these respondents (88 percent) said that they were attending school in the month of the 1980 interview.
TABLE 2
Cross-Tabulation of 1980 and 1985 Responses about School Attendance

<table>
<thead>
<tr>
<th>1985 Response</th>
<th>1980 Response</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Full-time Attendance</td>
</tr>
<tr>
<td>Full-time attendance</td>
<td>358</td>
</tr>
<tr>
<td>Part-time attendance</td>
<td>13</td>
</tr>
<tr>
<td>No attendance</td>
<td>14</td>
</tr>
<tr>
<td>Total</td>
<td>385</td>
</tr>
</tbody>
</table>

Note: The number of respondents who gave identical answers in both interviews is circled. This analysis excludes the 85 respondents who said in 1980 that they were in high school, since these respondents were not asked whether they attended full or part time. In 1985, 75 of these respondents (88 percent) said that they were attending school in the month of the 1980 interview.

those who were out of school in 1980 were to change their response from no attendance to some schooling in 1985. Part-time school attendance was remembered less well than either full-time attendance or no attendance. Of the 67 respondents who indicated in 1980 that they attended school part time, one third said in 1985 that they had attended part time, one third said that they had attended full time, and one third said that they had not attended at all during that month.

10.3. Employment Status

Table 3 displays the respondents' 1980 and 1985 reports of their paid employment during the 1980 interview month, subdivided into three categories: no work, part-time work (1–29 hours), and full-time work (30 plus hours). The 1980 and 1985 responses about work are somewhat less consistent than the responses about schooling. The data

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6 The questionnaire included two categories for part-time work: 1–9 hours and 10–29 hours. However, because only 38 respondents indicated at each interview that they had worked 1–9 hours, the two categories were merged.
TABLE 3
Distribution of Employment Status in 1980, as Measured in 1980 and 1985

<table>
<thead>
<tr>
<th></th>
<th>1980</th>
<th></th>
<th>1985</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Full-time employment(^a)</td>
<td>300</td>
<td>35</td>
<td>367</td>
<td>42</td>
</tr>
<tr>
<td>Part-time employment(^b)</td>
<td>236</td>
<td>27</td>
<td>240</td>
<td>28</td>
</tr>
<tr>
<td>No employment</td>
<td>332</td>
<td>38</td>
<td>261</td>
<td>30</td>
</tr>
<tr>
<td>Total</td>
<td>868</td>
<td>100</td>
<td>868</td>
<td>100</td>
</tr>
</tbody>
</table>

*Note.* This analysis excludes the 10 respondents who said in 1980 that they were in the military.

\(^a\) Full-time employment is 30 or more hours per week.

\(^b\) Part-time employment is less than 30 hours per week.

show an aggregate shift in reports of work status; 8 percent fewer of the respondents reported no work in 1985 than in 1980.

Table 4 shows the cross-tabulations of the 1980 and 1985 responses about employment. Again, the responses show that there is more divergence in reports of work activity between 1980 and 1985 than in reports of schooling. Still, if we dichotomize the variable,

TABLE 4
Cross-Tabulation of 1980 and 1985 Responses about Employment

<table>
<thead>
<tr>
<th>1985 Response</th>
<th>Full-time Employment</th>
<th>Part-time Employment</th>
<th>No Employment</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Full-time employment(^a)</td>
<td>249</td>
<td>83</td>
<td>63</td>
<td>27</td>
</tr>
<tr>
<td>Part-time employment(^b)</td>
<td>31</td>
<td>10</td>
<td>153</td>
<td>65</td>
</tr>
<tr>
<td>No employment</td>
<td>20</td>
<td>7</td>
<td>20</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>300</td>
<td>100</td>
<td>236</td>
<td>100</td>
</tr>
</tbody>
</table>

*Note:* The number of respondents who gave identical answers in both interviews is circled. This analysis excludes the 10 respondents who said in 1980 that they were in the military.

\(^a\) Full-time employment is 30 or more hours per week.

\(^b\) Part-time employment is less than 30 hours per week.
restricting the categories to some work and no work, we find that 83 percent of the respondents in 1985 confirmed their 1980 report. Even when we match the responses over the full spectrum of work hours, we find that 72 percent of the respondents gave identical answers in 1980 and 1985.

It is not surprising that the reports about schooling are more consistent over time than the reports about work. School attendance at age 18 represents a long-term commitment, while gainful employment changes more frequently. Thus, recollection of the incidence of work in a particular month might be less reliable than the recollection of school attendance. Respondents in 1985 appear to have noticeable bias towards reporting that they had worked in 1980 when they had indicated otherwise in the 1980 interview. Of the respondents who said in 1980 that they were not working, one third said in 1985 that they had done some work in the 1980 interview month. But of the respondents who reported in 1980 that they were working, either full or part time, only 7 or 8 percent reported in 1985 that they had not worked.

10.4. Interviewing Mode Differences

Approximately 55 percent of the 1985 respondents were interviewed in person, and approximately 45 percent were interviewed by telephone. This enabled us to compare the consistency between the 1980 and 1985 responses in each interview mode. We found that the two modes produced almost the same degree of consistency between the 1980 and 1985 reports of schooling and work.

10.5. The Interviewers' Appraisal of the Accuracy and Convenience of the LHC

Twenty-two of the 23 interviewers in our study responded to a mail questionnaire about their experience with the LHC. Twenty-one of the interviewers reported that the respondents found the LHC interesting, and 17 of these said that the respondents expressed more than a little interest. Nineteen out of 22 said that it would have been harder to obtain the detailed LHC information with a conventional questionnaire, and 3 said that it would have been "about the same." Eighteen of the 22 interviewers believed that the LHC obtained higher-quality data than would have been obtained with a standard
questionnaire, 13 believed that the LHC data were much better, and none of the interviewers believed that the LHC data were worse.

The interviewers gave several reasons for considering the LHC an easier and more accurate technique for collecting these life course data, such as "the LHC was a visual aid for the respondent," "it jogged their memories," "respondents found it enjoyable," respondents found it "less tedious," "it made them more cooperative, less placid," "respondents saw the gaps and inconsistencies instantly," and "it helped them detect and correct recall errors."

11. DISCUSSION

The LHC used in this study seems to have yielded high-quality retrospective data. The very small number of nonresponse items on the LHC, the close correspondence between the 1980 and 1985 responses, and the interviewers' reports about the usefulness of the LHC for aiding respondent recall suggest that an LHC can be an important vehicle for improving the quality of retrospective data.

One important issue in obtaining retrospective data appears to be the degree of volatility of the activity patterns, since respondents find it more difficult to recall widely fluctuating event patterns. The greater accuracy of our schooling data, as compared with our employment data, probably reflects the greater volatility of work patterns. Thus, in selecting variables for a retrospective study, the researcher should be aware that highly variable events will probably be measured less accurately than other events. Still, the LHC enables the researcher to link volatile events to less varying activity patterns and thus improves the accuracy of the data.

The volatility of life events and thus the reliability of recall may also vary with the age of the respondents. However, we have no way of knowing whether the activity patterns of older respondents are more or less volatile than those of our respondents. Most of our respondents had left high school eight to ten months before their 1980 interview. Many were making tentative decisions about school, work, and living arrangements, which for some involved frequent changes. It is possible that a similar study of 30-year-olds might show larger discrepancies between current and retrospective measures, but we have no way of knowing whether the accuracy of the data would be different in an older sample.
Although an LHC has great potential for improving data quality, it can only reach this potential if it is designed and implemented carefully. Unfortunately, because of the relative newness of this technique, researchers can draw on only a limited body of prior experience. What we have tried to do here is share our experience with such a calendar, noting the problems we encountered, the mistakes we made, and the techniques that proved useful, with the hope that other researchers can benefit from our experience.

REFERENCES


