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Citation Information


Article: The Life Chart Interview: a standardized method to describe the course of

Author: Lyketsos, C G

ISSN: 1049-8931

EISSN: ( )

Volume: 4

Issue: 

Quarter: 

Season: 

Number: 

Month: 

Day: 

Year: 1994

Pages: 143 - 155

Citation Source: null

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THE LIFE CHART INTERVIEW: A STANDARDIZED METHOD TO DESCRIBE THE COURSE OF PSYCHOPATHOLOGY

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SUMMARY
This paper discusses in detail the development and pilot testing of the Life Chart Interview (LCI) method, a standardized interview designed to assess the course of psychopathology as it interdigitates with a person's life history. The interview method draws from recent developments in autobiographical memory and life calendar research. The LCI uses age- and calendar-linked personal landmarks and an interactive chart to describe the time sequence of psychopathology and life events in parallel. Results from pilot testing of this interview as part of the 1993 Baltimore Epidemiologic Catchment Area follow-up study are presented. Future directions in the development and application of the LCI are discussed.

KEY WORDS—Diagnosis, psychiatric disorders, life events, comorbidity, memory.

INTRODUCTION
Gathering high quality information on the course of psychopathology is essential to several scientific endeavors. Most knowledge relevant to the epidemiology of mental disorders depends on data of this type—for example, age of onset, course, co-occurrence, recurrence of symptoms and relationship of symptoms to life history. Both prospective and retrospective studies collect data retrospectively as they rely on respondents' memory for events between two points in time. The reliability of such recollections probably decreases over time. However, it is not known how far back in time such data can be collected reliably.

The recollection and timing of psychopathology is the cornerstone of clinical psychiatry, where information on the patient's history and course of symptoms is crucial in diagnostic formulation and treatment planning. It also has application in the scientific study of the progress of psychopathology through the life span, which is being pursued by psychiatrists (e.g. Susser et al., 1990) and social scientists (e.g. Freedman et al., 1988). This endeavor has been augmented by the development and application of powerful statistical techniques (Kalbfleisch et al., 1980; Allison, 1984; Tuma et al., 1984).

Several standardized methods have been developed to collect information on the longitudinal course of personal history or of psychopathology (Brown et al., 1978; Freedman et al., 1988; Keller et al., 1987; Susser et al., 1990). All have demonstrated the feasibility of collecting useful data for the specific purpose of their design. However, their potential application is limited, as they are focused on the course of personal history (Freedman et al., 1988), are designed for longitudinal study with a limited time scope (Keller et al., 1987), or are complicated (Brown et al., 1978; Susser et al., 1990).

We present a new interview method, the Life Chart Interview (LCI), which was designed to obtain information on several aspects of personal history intertwined with the course of psychopathology. This method draws from the literature on autobiographical memory and uses age- and calendar-linked landmarks and life change anchors to prime recall. It is capable of covering periods of years. The LCI is also short, flexible, easy to

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Received 19 March 1993
Accepted 23 September 1993
learn and can be adapted to use with most psychiatric assessments of psychopathology, whether fully or partly standardized. Its greatest strength is that it allows a quick view of the progression of one or more (comorbid) psychiatric syndromes or disorders over several years as they interdigitate with the course of demographic parameters.

The background and development of the LCI is reviewed. Memory research relevant to this method is first summarized. Then, some other instruments prepared for similar uses are reviewed to illustrate the relative strengths of the LCI and the gaps which it can fill. Finally, the discussion focuses on the development of the LCI, a description of its approach and an outline of its current form. The latter includes the results of an LCI pilot test and an overview of future uses of the interview.

BACKGROUND

Autobiographical memory research

The study of autobiographical memory has a long tradition, rich in both theory and empirical inquiry (Friedman, 1993). We summarize knowledge of what affects the recollection of one's personal past, focusing on how accurately events are recalled and dated. Memory for personal history, general health and psychiatric symptoms are of prime interest.

Early studies suggested that recollection of autobiographical episodes by young people is dependent on 'age at episode'. More remote episodes are least well recalled, and recall is best for more recent events (Crovitz et al., 1974). For the elderly, the same pattern has been observed, except that there is a second lower peak of recalled events in early adulthood (Rubin et al., 1986). Frequency of memory for recalled events over a 20-year period prior to recall appears to be independent of age at recall or the presence of dementia (Sagar et al., 1991).

Another major factor affecting autobiographical event recall is 'mood congruence'. Indeed, current mood state appears to serve as a retrieval cue for congruently toned material in long-term memory (Blaney, 1986). This has been shown to be true both for positive and negative moods (Bullington, 1990).

Studies have applied a variety of research paradigms to assess the accuracy of recalled and dated autobiographical material over periods of years. Jenkins et al. (1979) reported the results of a test–retest paradigm where subjects were asked to recollect prior life events at different times over 15 months. After 6 months, without cues, on average 34% of previously reported life events were forgotten. Information on general health, marital status and residence were forgotten least, while occupational history fared the worst.

In contrast, Gladisio et al. (1992) showed that alcoholics, making use of 'recall aids' such as self-generated cues, calendars and event reminders from popular culture, could accurately recall drinking patterns and life events over six years. Recall was best for general psychopathology, health, family life and occupations. Memory was most accurate when it referred to observable and quantifiable events.

The importance of cues in the recall and dating of biographical events is supported by other lines of evidence. Sliemek (1978) showed that self-generated lists are better remembered, and suggested that self-generated cues are more effective in aiding memory. Wagenaar (1986) reported a six-year study of his own memory which suggested that very little of one's biography is truly forgotten, but that memory cues are essential for accurate recollection. He demonstrated the importance of the nature of cues: personal cues and double or triple cueing greatly improved recall. Recalling similar material in temporal sequences was also quite effective. He concluded that questions about 'when' are best augmented with concrete information on 'who, where and what'. Well constructed autobiographical cues have been found to successfully replicate mood states relevant to recall (Bullington, 1990).

Friedman's review (Friedman, 1993) entitled 'Memory for the Time of Past Events' suggests that dating of past events is most accurate when a 'location oriented search' is used. Events are dated based on their own characteristics and those of 'surrounding' memories which place them in a specific period in a person's life. Locating target events in particular periods in the person's life greatly promotes accuracy of dating because the events are linked to other events in the same period. Such targets, particularly when associated with specific dates in calendar time, are dated with remarkable accuracy even after long time periods (Friedman, 1993).

Regarding the recall and dating of health-related events, Loftus et al. (1991) reported findings from a series of experiments. Respondents preferred recalling the sequence of health events forward in time. However, they were most accurate in backwards recollection. Also, the use of landmarks
LIFE CHART INTERVIEW

('highly salient events') and time ordering was shown to improve the dating of past events and to reduce 'forward telescoping', i.e. the recollection of an event as having occurred more recently than it actually did (Loftus et al., 1983).

Studies of the retrospective recollection and dating of psychopathology show inconsistent findings. Over short test–retest time periods (days to months), the accuracy of lifetime psychopathology is thought to be good, particularly in patient populations (reviewed by Bromet, 1986; Wittchen et al., 1989). However, Bromet et al. (1986) showed that, in a community sample, the test–retest reliability of a lifetime diagnosis of major depression was 'poor' using the Schedule for Affective Disorders and Schizophrenia. Even the more reliable participants in the study were inconsistent in their reports of number of episodes of depression, length of longest episode and age at first episode.

A 'life events calendar' was recently used to improve the recall and dating of events during the past 12 months (Kessler et al., 1991) in a semi-structured interview. Test–retest reliabilities for illness events were found to lie in the range 0.80–0.90. However, other adverse life events were recalled with considerably less accuracy using this method.

Researchers have not reported on attempts to improve the recollection of psychopathology using memory cues or other approaches.

A major problem in much of this research has been the lack of external validation of recalled autobiographical memory. Most studies rely on test–retest paradigms as indicators of accuracy. Others use agreements with reports by collateral informants. Informants' memory, however, is probably no more accurate than the memory of the primary respondent (Sagar et al., 1991). The best approach is to use records made contemporaneous with the event, such as work and health-care records, although their use has obvious practical limitations. Also, it is not clear whether recall and dating of events varies by individual characteristics, such as gender, ethnicity and socioeconomic status. This is a matter which needs to be further tested.

In summary, biographical event recall and dating for as long as 20 years prior to recall is potentially accessible and accurate. Accuracy decreases backwards in time but seems to be quite good for the six-year period prior to recall, provided occurrences of interest are clearly defined. Certain types of events are better recalled – namely matters of health, marital status, location of residence and, to a lesser extent, work status.

Memory is best accessed using carefully developed memory cues. These cues are optimal if they are highly salient events linked to a specific time period. Use of multiple, self-generated and personal landmarks further enhances memory. Also, memories should be accessed as part of a sequence rather than by asking the individual to recall events at a point in time. Application of these findings to the recall of psychopathology suggests that the course of disorders could be recalled most accurately when using sequential recall of time periods, employing clear definitions of syndromes and in the context of well constructed memory aids.

Review of similar instruments

Social scientists have developed several structured interviews to obtain autobiographical information on personal history. The goal has been to reconstruct event histories for several themes in an individual's life course (Balan et al., 1969; Blum et al., 1969; Tuma et al., 1984; Anderson et al., 1986; Furstenberg et al., 1987).

The core of these approaches is best exemplified by the Life History Calendar of Freedman et al. (1988). Here, an interview is designed around a calendar which 'amalgamate[s] the charts for a number of different event histories (p. 40). The interviewee's biography is rewritten in temporal sequence as events along several themes are explored in sequence. Themes of interest include schooling, work, marital history, cohabitation, fertility, living situation, migration and others. The method allows for temporal flow along one theme which may serve as a cue and cross-check for other themes. Questions are standardized and responses are coded according to response needs. The interview is interactive, allowing the interviewee to observe entries into the Life Calendar.

The instrument has been acceptable to both interviewers and participants in a variety of settings (Freedman et al., 1988). Test-retest reliability after five years shows 90–100% concordance on items relevant to marital and school history, and agreement in the 70–85% range for employment history; it is particularly high for participants who were unemployed at one of the interviews (Freedman et al., 1988).

The studies noted here form the foundation for autobiographical history research methods. They demonstrate the feasibility of obtaining accurate
information over long time spans. Unfortunately, these methods have not been used much in research on the course of psychopathology alone nor on its intertwining with the course of personal history.

Significant efforts have been made or are under way to study the recall of psychopathology over time (Brown et al., 1978; Keller et al., 1987; Susser et al., 1990). Using a series of techniques incorporated in the Life Events and Difficulties Schedule (LEDs), Brown et al. (1978) showed that reliability in the dating of life events and of psychiatric symptoms can be improved. However, their method did not use current criteria to define psychopathology and was so long and complicated that it required highly skilled interviewers (Kessler et al., 1991).

Best studied is the Longitudinal Interval Follow-up Evaluation (LIFE) developed by Keller et al. (1987) for the Psychobiology of Depression Collaborative Study. It was designed to collect psychosocial, psychopathological and treatment information for the preceding six months in a prospective study.

The LIFE uses definitions of psychopathology from a standard nosology, the Research Diagnostic Criteria (RDC). Its amount of detail is flexible. It attempts to locate events within a single week. Questions are standard and responses are coded. The interview does not use specific memory cues, instead tracing the course of information starting with what was reported at the last interview. The LIFE takes 45 minutes to 2 hours to complete, and its administration requires trained interviewers. Reliability studies on small numbers of patients have shown high degrees of test–retest agreement between interviews given a few months apart (Keller et al., 1983, 1987).

A similar instrument has been designed for the WHO Multi-Center Study on the Course and Outcome of Schizophrenia. The Life Chart Rating Form (Susser et al., 1990), designed for retrospective and follow-up study, focuses on the detailed course of specific symptoms defined according to the Present State Examination (PSE) glossary. It also makes 'broad ratings' on residence, work and treatment during the last two years. A very detailed figure is shown to the participant, which includes coding space for each area of interest. Specific memory cues are not used. The interview is flexible and allows the subject to direct its flow. Its main disadvantages are its length (1–2 hours to administer) and untested reliability.

The application of Life Calendar methods to the retrospective study of psychopathology has been slow to evolve. The three major efforts reviewed here have several strengths. However, all share limits caused by their failure to use memory cues, limited time span covered, and interview length.

THE LIFE CHART INTERVIEW

Development

The Life Chart Interview (LCI) was developed for the 1993–94 Epidemiologic Catchment Area (ECA) follow-up study. Its primary purpose was to describe the evolution of psychopathology over the 10–12-year period since Wave II of the 1981 Baltimore ECA. The focus of the present wave is on the following disorders, using DSM–III–R (APA, 1987) criteria: agoraphobia, major depression, obsessive compulsive disorder, panic disorder, social phobia and substance use disorders (specifically alcohol, marijuana, cocaine and tobacco).

The goals of the LCI's development were as follows:

(1) to produce a standardized interview which would track the course of psychopathology as it intermixes with personal history, over long time periods;
(2) to improve the accuracy of recalled and dated psychopathology by using carefully selected memory aids;
(3) to improve the accuracy of recalled and dated psychopathology by encouraging interaction between the respondent and his/her life calendar as it is being developed;
(4) to develop a short, flexible method which can be used with structured psychopathology interviews from several backgrounds.

To design the instrument, several decisions had to be made. These included the structure of the interview itself, the type and nature of memory cues, the appearance of the interactive life calendar, the information to be collected, data coding and the interview's time unit. These decisions were based on the literature discussed and several pre-tests on patients.

In order to guide the development of the interview, two pre-tests were completed. Results from these are mentioned below as the interview structure is presented. One was performed at the University of Arkansas for the Medical Sciences, where 21 participants in a previous study on somatization disorder were interviewed. The purpose was to establish what types of cues work best in helping
psychopathology recall and what visual appearance of a life calendar (vertical or horizontal) is most conducive to making this process interactive.

The second pre-test was performed with six patients of the Phipps Psychiatric Clinic at Johns Hopkins who were interviewed twice with the DIS and with early forms of the LCI. The purpose was several-fold: to improve the flow of the interview questions; to learn the minimum time period that could be used reliably; to decide what information on psychopathology could realistically be obtained for every time unit of interest; to develop specifications and training procedures.

The interview method

Time unit. A crucial aspect of the LCI's design which had to be resolved early was the definition of its time interval of interest. As the interview was to span several years of recall, the gathering of meaningful information had to be balanced against excessive prolongation of the interview. Four-month, three-month and one-year intervals were explored with patients. The level of one year was most meaningful and generated data which was in 75% agreement with a retest one week later. The year was demarcated for the respondent both in terms of the date (e.g. 1991), and in terms of the subject's ages during that year (e.g. 34/35 years).

In pre-tests, respondents were able to choose landmarks, recall personal history and recall psychopathology summarized over a one-year period more than 80% of the time. Respondents are asked to describe the year with one or two items. When sociodemographic status changed during the year, respondents were asked to choose the status which applied to the largest time block in the year. For example, someone who held four jobs would be asked to give the job held for the longest period. For psychopathology this was done through the development of two rating scales (see below).

Memory cues. The literature (Slameka, 1978; Loftus et al., 1991; Gladisjo et al., 1992; Friedman, 1993) and a pre-test suggested that multiple, self-generated, personal and affectively laden landmarks are the best cues in eliciting accurate autobiographical recall. Two types of memory cues are used in the LCI, as outlined below. These are linked with each other, with age and with calendar time to promote the development of an integrated memory anchor for each year covered. The cues then incorporate linked elements of time, events, change, persons, activities and location. They are developed sequentially in an interactive fashion, allowing for updates as memory improves.

Cues are used with two purposes in mind. The first one is to prime the respondent's memory about a long time period of interest by breaking it down into smaller time pieces (years) and associating sets of landmarks with each year. This is accomplished at the start of the interview. In part, it is also intended to improve the overall recall of symptom occurrences using a standardized interview such as the DIS – see below. The second goal is to produce more accurate dating of psychopathology by linking it with age, calendar time and landmark events.

Landmarks: The landmarks obtained at the start of the LCI are the primary cues. These might be personal events ('my son was born'), indicators of stability ('I had a job for 6 months'), local celebrations ('the Redskins won the Superbowl') or national disasters ('I was caught in the riots'). They are chosen by the interviewee. To help with this choice, the subject is handed a short-list of areas as probes (such as family, school, work, national events etc.). The interviewer holds an extensive list of individual items (such as births of children, promotions, vacations, hobbies) that can be used to further help the participant choose a landmark.

Life change anchors: These are socio-demographic characteristics gathered with the help of the landmarks. They reflect change (or stability) in three areas: residence, marital status and occupation. These data are used as memory cues for the recall of other cues and of psychopathology in the second phase of the LCI. The interviewee's age during each year of a period of recall is also noted and confirmed.

Interview structure. The LCI currently has two sections, the first one in which memory cues and the temporal course of socio-demographic data are obtained and the second in which the course of psychopathology of interest is ascertained.

Section one: Landmarks and life change anchors (events): The LCI begins with establishing 'personal landmarks' for each year as a means of setting a more personal and friendly tone for the interview. This is done so that one anchor is obtained for every year of interest, going backwards in time from the present in order to have a place to start and to ensure continuity (Loftus, 1991). These personal landmarks serve as the primary memory anchors.
As each landmark is obtained, concurrent residence information is also obtained. The next steps are to collect marital and occupational histories year by year in the same way.

This process establishes several types of cues for later use: landmarks, age, residence (where), marital (who) and occupational (what job) information. It also collects sequential, dated socio-demographic data. Finally, it serves as a means of cross-checking information on the various themes under investigation. The data collected in this first part can be varied in type and detail depending on the investigator's interests. For example, fertility history might be collected if its association with psychopathology is to be assessed.

Section two: Psychopathology: After the first section is completed, the interview obtains recall of psychopathology year by year. The research investigator can choose the ascertainment method, definitions, thresholds and detail to be recalled. The researcher also sets a threshold for each disorder.

In our ECA follow-up, the disorders mentioned above are targeted, using DIS/DSM–III–R definitions. Respondents who meet DIS criteria for ever having had a panic attack are asked about the frequency of panic attacks during each year in the past 12. Pre-tests showed that respondents had much difficulty recalling whether for a particular year their panic attacks had clustered sufficiently to meet criteria for panic disorder. Thus, it was decided to focus only on frequency of attacks during the year, not on the number of attacks in a four-week period. Respondents who meet lifetime criteria for a major depressive episode are asked about the occurrence and duration of depression plus two significant symptoms in each year over the same time period.

Those who meet lifetime criteria for social phobia or agoraphobia are asked about the course of their disorder year by year over the same 12 years. Because these phobias typically have long durations which span years, respondents are not asked for the duration of phobic symptoms during the year in which they occurred. Finally, all who meet one lifetime DSM–III–R 'A' criterion for an alcohol or other substance use disorder are asked to quantify their frequency of use of that substance during each of the 12 years, year by year. Pre-tests showed that asking quantity of the substance used was too complicated. Anthony et al. (1991) suggest that adding quantity to frequency does not further distinguish among persons who have already met criteria for a use disorder.

Every time a lifetime diagnostic threshold is crossed, the interviewer is directed back to the second section of the LCI. The onset and offset of the threshold syndrome is established using the DIS wording. Because pre-test patients preferred forward recollection of psychopathology, information on the course of psychopathology is gathered forward in time. The annual landmarks and life change anchors are used to prime recall of occurrences of the disorder in each year.

Recording format. The Life Calendar is the core of the LCI method. A copy of the calendar with headings tailored to the needs of the ECA follow-up is included in the appendix. This form was designed with two purposes in mind. The first is to record information provided by the interviewee, which can be accurately and easily coded, and entered in computer later. The second is to provide a visual interactive memory aid to the interviewee when asked to recollect information about years being reviewed.

Pre-tests showed that respondents and interviewers preferred a vertical format with questions on landmarks proceeding backward in time. Thus, the Calendar is vertically organized and occupies one side of an 11 x 17 sheet of paper. This is folded in half, with the life events section linked to the left half (first nine columns), and the psychopathology section linked to the right half (starting with column labelled 'PAN'). The left side is a fivefold grid with columns representing (in order) age, year, landmarks, residences (2), marital (2) and occupational (2) status. Each column is crossed by a row to form a cell for each age/year of interest. Cells are designed to hold either coded information or written answers which are the memory cues. For example, under the residence section the column under 'PLACE' is used to fill in cue information while the column under 'MOVE' contains a coded answer on whether the respondent changed residencies during that calendar year. The column labelled 'PLACE' must be readable by the interviewee as well as the interviewer and therefore contains sufficient space for readable write-in cues.

The right side of the calendar holds coded information on psychopathology. Each column represents a syndrome or disorder of interest. In this instance they are 'PAN' for panic disorder, 'PHOB' for agoraphobic and social phobia, 'DEP' for major depression and 'SUB' for the five substance use disorders covered. These columns are also crossed by lines to form cells representing each
year under investigation. Panic and substances section have a double-digit box each because they use a single-digit box under 'EPISODE' coded on scale two below. Only depression collects information on episode 'DURATION'. A quick glance at each psychopathology column reveals the ebb and flow of a disorder or syndrome over time. After the interview is completed, clinician examiners will use this Life Chart as a visual aide for follow-up assessments.

In both sections, years are ordered backwards in time starting at the top of the form. At the top left is recorded the interviewee's date of birth, to help with calculations; current age is the first entry into the age column. The titles of each column are neutral so that when interviewees look at the Calendar, they are not distracted by names of individual syndromes.

Measurements of frequency and duration. Coded information can be obtained for all themes covered by the LCI. In the first section, how much information is coded and how much is used only as cues will depend on the investigator's goals. Desire for detail must be balanced against excessive prolongation of the interview. For the ECA follow-up, coded data is obtained for every year on change of residence, marital status and occupational type. A method for coding annual landmarks is not available at present.

To ascertain psychopathology, two scales were developed (Table 1). The first ten-point scale (Table 1) assesses frequency of discrete events during a year, such as frequency of substance use or panic attacks. It quantifies this frequency from several times a day to a few times during the year. This scale was adapted from the Baltimore ALIVE study, where it has been successful in grading previous drug use among drug injectors (Anthony et al., 1991).

The second scale was intended to summarize the course of disorders where the ebb and flow of psychopathology is more gradual. With regard to depression, for each year respondents are asked if they had the syndrome of interest during that year, e.g. depressed mood plus two significant DIS symptoms. When the response is affirmative, they are asked if that episode ended during the year. If it did, the duration of the longest episode is ascertained. This approach limits the information obtained to 'on/off' and to duration information for the longest episode, i.e. multiple episodes during one year are not covered.

<table>
<thead>
<tr>
<th>Table 1. Rating scales used in the Life Chart Interview</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale one: used to rate frequency of discrete events such as panic attacks or substance use</td>
</tr>
<tr>
<td>Every day, but more than once a day 09</td>
</tr>
<tr>
<td>Every day, once a day 08</td>
</tr>
<tr>
<td>4 to 6 times a week 07</td>
</tr>
<tr>
<td>2 to 3 times a week 06</td>
</tr>
<tr>
<td>Once a week 05</td>
</tr>
<tr>
<td>2 to 3 times a month 04</td>
</tr>
<tr>
<td>Once a month 03</td>
</tr>
<tr>
<td>Several times a year 02</td>
</tr>
<tr>
<td>Once a year 01</td>
</tr>
<tr>
<td>Never that year 00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Scale two: used to rate presence or absence of episodic or continuous events</th>
</tr>
</thead>
<tbody>
<tr>
<td>Episode not present during the year 01</td>
</tr>
<tr>
<td>Episode present but did not end during the year 02</td>
</tr>
<tr>
<td>Episode present and ended during the year 03</td>
</tr>
</tbody>
</table>

For every '3' coded, duration of longest episode ending in the year is ascertained in weeks, months, or years - when carried over from previous years.

Pre-tests suggested that more detailed information on the dating or duration of multiple episodes during a particular year could not be reproduced one week later. Also, respondents in pre-tests were uncertain about details within a year and there were many missing data. However, there was consistency in reporting weeks depressed in a particular year which is the response measure used to gauge duration of depression. The approach assumes that episodes which did not end during a year continued into the next so that durations can be accumulated.

With regard to the phobic disorders, annual duration information is not collected because of their expected long duration. This could be easily modified for different research projects.

Coding. Most responses are coded on the life calendar. If there is interest in obtaining more detailed information on a particular theme, additional coding space will be necessary to avoid cluttering the calendar and making it less appealing to interviewees. In the ECA, occupational history, where considerable detail is obtained, is coded in a separate interview booklet. This information consists of detailed census occupation codes for the most important job held by the respondent in each year.

Sample questions. LCI questions are written in simple English with attention paid to their reading
level. Questions on landmarks begin by establishing a starting time in the present and then moving back in time to obtain year by year data. For example:

Starting with the present and working back to 1981, I would like to discuss significant events that happened to you. By significant events, I mean anything that helps you mark the passage of time. For example, finishing school, moving, deaths or births in the family, vacations, changes in your intimate relationships, and local or national events. This is 1993; what are some significant events that have happened to you this year that will help you remember it?

This works similarly for demographic indicators:

Now I would like to focus on recollecting your work history over the past several years, again going backwards in time. Here is a list to help with your answers HAND CARD C [contains codable answer options].

(a) This is 1993. What have you been doing most of the time this year, working, keeping house, going to school or something else?
(b) What about 1992? What were you doing most of the time that year, working, keeping house, going to school or something else?

Questions on psychopathology use wording from the DIS in defining the syndrome sought for any particular year:

Now, I would like to talk to you about these spells of two weeks or more when you felt both (depressed/OWN EQUIVALENT) and had some of these other problems in between those times.
Let's recall 1981, the year that READ OFF EVENTS. During that year, did you have any of these spells for two weeks or more when you felt both (depressed/OWN EQUIVALENT) and had some of those other problems at the same time?
IF YES: Did that spell end during that year?
IF YES: How many weeks were you depressed that year?

Training. The LCI is designed to be used by any survey interviewer trained in the use of a standardized schedule of psychopathology such as the DIS. Training instruction incorporates review of the instrument and its purpose, its interphase with the diagnostic interview and at least six practice sessions for each section. Training is assisted by the use of detailed specifications, videotapes and overhead projection of the LCI’s calendar during practice runs. A total of 8 h of training is needed to become comfortable with the use of the LCI.

Pilot testing

The LCI was pilot-tested on 51 community persons as part of the pilot test of the ECA follow-up instrument. This was done in two phases, with 31 and 22 subjects in each phase, respectively. The sample was selected to closely resemble the initial ECA cohort in its demographics. Baltimore City census tracts of a diverse nature (two inner city, two outlying) were chosen for both phases. Four participants from each tract were paid for their time.

Households were called, based on random digit dialing of telephone numbers from the Criss-Cross Directory of the designated tracts. Participants were chosen from these households to represent a diverse demographic background. Seventeen people contacted refused or cancelled participation. Interviews were conducted at the interviewee’s homes by interviewers working for the field contractor, Survey Research Associates. Interviewers were trained in the use of the LCI in a three-hour session. Table 2 presents the demographic descriptors of all pilot participants.

The LCI was well received by interviewers and participants. Its purpose was well understood, and its flow was good. The memory cues were reported to be very helpful by many participants; in contrast, interviewers noticed a limited amount of interaction between subjects and the calendar. Select administration times are also on Table 2. On average, the life events (first) part of the LCI took 15 min to complete. Review of the time course of each syndrome took an additional 3–6 min, although it was slightly shorter for the conditions using the first scale as compared to the second.

Table 2. Demographic descriptors of pilot study participants ($n = 51$)

<table>
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<tr>
<th>Gender</th>
<th>Male</th>
<th>21 (41%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Race</td>
<td>Non-white</td>
<td>23 (45%)</td>
</tr>
<tr>
<td>Age (years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30–39</td>
<td>14 (27%)</td>
<td></td>
</tr>
<tr>
<td>40–49</td>
<td>9 (18%)</td>
<td></td>
</tr>
<tr>
<td>50–59</td>
<td>11 (22%)</td>
<td></td>
</tr>
<tr>
<td>60–69</td>
<td>9 (18%)</td>
<td></td>
</tr>
<tr>
<td>&gt;70</td>
<td>8 (15%)</td>
<td></td>
</tr>
</tbody>
</table>

Administration times for the LCI

<table>
<thead>
<tr>
<th>Section 1</th>
<th>mean</th>
<th>15 min</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>median</td>
<td>12 min</td>
</tr>
<tr>
<td></td>
<td>range</td>
<td>5–32 min</td>
</tr>
<tr>
<td>Section 2</td>
<td>mean</td>
<td>4 min</td>
</tr>
<tr>
<td></td>
<td>median</td>
<td>4 min</td>
</tr>
<tr>
<td></td>
<td>range</td>
<td>3–6 min</td>
</tr>
</tbody>
</table>
In terms of information collected, annual landmarks were obtained for 465 (76%) out of 612 person-years (12 years for each of 51 subjects). On average, each participant produced at least one landmark for 9.1 (standard deviation 3.0) of the 12 years reviewed. Roughly one-third (15) of participants gave a landmark for every year reviewed, and 20 out of 51 produced landmarks for one-half or more of the 12 years. Data collection on change of residence, marital status and work history was much more fruitful, with all 51 participants providing data on all years reviewed.

With regard to the psychiatric syndromes reviewed, the threshold for significance was crossed by 37 participants for at least one syndrome. The great majority of positives were for disorders of alcohol or tobacco use, for which low thresholds had been set. The quantity of substance use was described during every year for all persons who met one lifetime 'A' criterion for a substance use disorder. The relevant substances were as follows: 18 alcohol, 15 tobacco, six marijuana, two crack cocaine and two other cocaine.

The threshold for the other syndromes was crossed as follows: major depression by two, panic attacks by five, agoraphobia by three, and social phobia by four. Respondents with phobias all gave chronic courses for their conditions spanning 4–10 years. Those with panic attacks produced a quantification of the frequency of their attacks for 83% of the years (33 out of 40 person-years) during which they were having attacks. Both respondents with major depressive disorder reported episodic illnesses. For one, a single depressive episode spanned three years during which they continuously had depressed mood and at least two other significant symptoms. The other respondent (Case 1 in Table 3) had a one-month episode of major depression which remitted spontaneously. This was followed two years later by a two-week relapse of depressed mood plus two significant symptoms. A second two-week spell recurred the next year.

Table 3 shows examples of illustrative life calendars – slightly altered to protect identity and simplified for demonstration. These examples underscore the types of results which can be obtained from the LCI with a quick glance at the calendar. In case one there is comorbidity between alcohol, depression and panic in a person with stable demographic indicators. Whereas alcohol use is substantial and chronic over many years (it goes back to age 41), the depressions are short-lived and seem temporally related to the panic attacks.

In case two, there is instability in the person’s demographic indicators as well as chronic heavy polysubstance use (not shown is chronic more than daily alcohol use), without other disorders. Of interest is the fact that her cocaine and tobacco use began the year she was imprisoned and continued in prison, whereas marijuana use was more chronic.

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Landmark</th>
<th>Work</th>
<th>Alcohol</th>
<th>Panic:</th>
<th>Depression</th>
</tr>
</thead>
<tbody>
<tr>
<td>52</td>
<td>Husband's job change</td>
<td>Keeping house</td>
<td>More than daily</td>
<td>No attacks</td>
<td>2 weeks</td>
</tr>
<tr>
<td>51</td>
<td>Son married</td>
<td>Waitress part time</td>
<td>Same</td>
<td>Frequent attacks</td>
<td>2 weeks</td>
</tr>
<tr>
<td>50</td>
<td>Grandchild born</td>
<td>Waitress part time</td>
<td>Same</td>
<td>Occasional attacks</td>
<td>None</td>
</tr>
<tr>
<td>49</td>
<td>Started working</td>
<td>Keeping house</td>
<td>Same</td>
<td>Onset, frequent</td>
<td>2 months' onset</td>
</tr>
</tbody>
</table>

Table 3. Illustrative life calendar results from the LCI pilot studies

Case 1: 53-year-old Caucasian woman

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Landmark</th>
<th>Marital</th>
<th>Work</th>
<th>Tobacco</th>
<th>Marijuana</th>
<th>Crack</th>
</tr>
</thead>
<tbody>
<tr>
<td>33</td>
<td>Uncle died</td>
<td>Divorced</td>
<td>Keeping house</td>
<td>More than daily</td>
<td>Daily</td>
<td>Daily</td>
</tr>
<tr>
<td>32</td>
<td>None</td>
<td>Same</td>
<td>Waitress</td>
<td>Same</td>
<td>Same</td>
<td>Same</td>
</tr>
<tr>
<td>31</td>
<td>In prison</td>
<td>Same</td>
<td>Prison</td>
<td>Same</td>
<td>Same</td>
<td>Same</td>
</tr>
<tr>
<td>30</td>
<td>Sent to prison</td>
<td>Separated</td>
<td>Prison</td>
<td>Occasional</td>
<td>Same</td>
<td>Same</td>
</tr>
<tr>
<td>29</td>
<td>Working</td>
<td>Same</td>
<td>Hostess</td>
<td>None</td>
<td>Same</td>
<td>None</td>
</tr>
<tr>
<td>28</td>
<td>Grandmother died</td>
<td>Same</td>
<td>Same</td>
<td>Same</td>
<td>Same</td>
<td>None</td>
</tr>
<tr>
<td>27</td>
<td>Death of great grandmother</td>
<td>Married</td>
<td>Same</td>
<td>Same</td>
<td>Same</td>
<td>None</td>
</tr>
<tr>
<td>26</td>
<td>Got married</td>
<td>Married</td>
<td>Same</td>
<td>Same</td>
<td>Same</td>
<td>None</td>
</tr>
</tbody>
</table>

Case 2: 33-year-old African–American woman
SUMMARY AND FUTURE

The LCI is a standardized method designed to ascertain the course of life history and comorbid psychopathology over several years. It incorporates knowledge from autobiographical memory research in developing memory anchors as aids in recall. It also has incorporated methods from life calendar research to visually describe and code the data obtained as well as to promote interaction between the participant and the life chart to further improve accuracy. The interview is short, easy to learn and flexible. It can be adapted for use with any standardized method of ascertainment for psychopathology, as well as with clinical interviews, as long as the definitions of the disorders is made clear to the interviewee.

In its present form, the LCI has been piloted successfully on 51 community volunteers in preparation for inclusion in the on-going ECA follow-up study where it will be used to interview over 2000 community residents. The interview works well and generates a large amount of information on several parallel themes in a person's life. Its test–retest and interobserver reliability are as yet untested, and plans are underway to assess it. Validation is best accomplished using information from previous records; this will be done within the ECA study by cross-checking LCI data with information obtained during interviews 10 years ago.

The purpose of this report is twofold. The LCI in its current form is available to be used for further methodologic research. Such research could assess the reliability of the LCI when incorporated into other standardized interviews, such as the Schedules for Affective Disorders and Schizophrenia (SADS) or the Schedules for Clinical Assessment in Neuropsychiatry (SCAN). Additionally, the LCI method could be used to measure the reliability of recalled symptoms over long periods of time for different definitions of psychopathology. For example, does the recall and dating of mood syndromes vary depending on how they are defined? The effect that individual characteristics, such as gender and ethnicity, have on the reliability of the recall and dating of psychopathology could similarly be assessed using the LCI method.

The LCI method could also be used to ascertain whether the use of landmarks and other memory cues improves the recall and dating of psychopathology. Does the use of these cues help respondents reliably report more symptoms in structured interviews? Also, do these cues improve the accuracy of dating psychiatric symptoms?

If the LCI has these advantages, the LCI and similar methods might be incorporated into standard ascertainment of psychiatric disorders in epidemiologic surveys. The recall of even one more critical symptom using the LCI method than in uncued recall would increase the number of respondents meeting criteria for a disorder. The use of cues is also expected to reduce ‘forward telescoping’ (Loftus et al., 1991) of the onset dating for symptoms. This has the potential of improving our knowledge of the age of onset of disorders.

The second purpose of this report is to inform other researchers of a method through which they can study the evolution of mental disorders over long time periods. This will be of particular interest to researchers who are looking at the course of comorbid disorders over time and/or their relationship to life events. While the ECA follow-up study will be using the LCI for the study of certain conditions, many other topics could be explored using this method. For example, the course of manic episodes, delusions, hallucinations, substance dependence, substance abuse and other conditions could be described longitudinally and in relationship to work, marital status and other life events. Finally, other researchers might develop means of coding landmark events along common themes and assess how they interrelate with symptoms.

ACKNOWLEDGEMENTS

This work was supported by grant NIMH 5T-32-14592 to Dr Lyketsos, and by ECA grant MH 47447. We are indebted to Carolyn Gorman, Brett Belote, Jean Farrell, Marjorie Hicks and Rita Tlighman-Putty for their interviewing work and feedback during the LCI pre- and pilot tests.

REFERENCES


## APPENDIX: THE LIFE CHART CALENDAR

**LIFHART**

<table>
<thead>
<tr>
<th>AGE</th>
<th>YEAR</th>
<th>LANDMARKS</th>
<th>LIFE EVENTS</th>
<th>RESIDENCES</th>
<th>MARITAL</th>
<th>OCCUPATIONAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>/</td>
<td>1994</td>
<td>Y</td>
<td>N</td>
<td>Move</td>
<td>Live</td>
<td>Job</td>
</tr>
<tr>
<td>/</td>
<td>1993</td>
<td>Y</td>
<td>N</td>
<td>Move</td>
<td>Live</td>
<td>Job</td>
</tr>
<tr>
<td>/</td>
<td>1992</td>
<td>Y</td>
<td>N</td>
<td>Move</td>
<td>Live</td>
<td>Job</td>
</tr>
<tr>
<td>/</td>
<td>1991</td>
<td>Y</td>
<td>N</td>
<td>Move</td>
<td>Live</td>
<td>Job</td>
</tr>
<tr>
<td>/</td>
<td>1990</td>
<td>Y</td>
<td>N</td>
<td>Move</td>
<td>Live</td>
<td>Job</td>
</tr>
<tr>
<td>/</td>
<td>1989</td>
<td>Y</td>
<td>N</td>
<td>Move</td>
<td>Live</td>
<td>Job</td>
</tr>
<tr>
<td>/</td>
<td>1988</td>
<td>Y</td>
<td>N</td>
<td>Move</td>
<td>Live</td>
<td>Job</td>
</tr>
<tr>
<td>/</td>
<td>1987</td>
<td>Y</td>
<td>N</td>
<td>Move</td>
<td>Live</td>
<td>Job</td>
</tr>
<tr>
<td>/</td>
<td>1986</td>
<td>Y</td>
<td>N</td>
<td>Move</td>
<td>Live</td>
<td>Job</td>
</tr>
<tr>
<td>/</td>
<td>1985</td>
<td>Y</td>
<td>N</td>
<td>Move</td>
<td>Live</td>
<td>Job</td>
</tr>
<tr>
<td>/</td>
<td>1984</td>
<td>Y</td>
<td>N</td>
<td>Move</td>
<td>Live</td>
<td>Job</td>
</tr>
<tr>
<td>/</td>
<td>1983</td>
<td>Y</td>
<td>N</td>
<td>Move</td>
<td>Live</td>
<td>Job</td>
</tr>
<tr>
<td>/</td>
<td>1982</td>
<td>Y</td>
<td>N</td>
<td>Move</td>
<td>Live</td>
<td>Job</td>
</tr>
<tr>
<td>/</td>
<td>1981</td>
<td>Y</td>
<td>N</td>
<td>Move</td>
<td>Live</td>
<td>Job</td>
</tr>
</tbody>
</table>