

Dating Major Life Events using an CAPI/CASI Event History Calendar in Add Health

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Abstract

This paper describes the purpose, design, and field administration of a CAPI/CASI Event History Calendar (EHC) in Wave III of the National Longitudinal Study of Adolescent Health, or Add Health. The Add Health EHC was implemented in Wave III when the Add Health cohort was aged 18-26 and in the midst of their transition to adulthood. The EHC was added to the Wave III questionnaire to improve accuracy in reporting lifetime event data. The EHC was primarily used as a memory aid during both the CAPI and CASI portions of the interview to help respondents answer questions about events such as romantic relationships, births and pregnancies, marriages, and graduations. We also present results from descriptive analysis that compares EHC data with other independent reports of similar events across interview waves and within the Wave III interview to assess the consistency of EHC data with other survey data.

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The National Longitudinal Study of Adolescent Health (Add Health) is an ongoing study of a nationally representative sample of more than 20,000 individuals that began with in-school questionnaires administered to adolescents in grades 7 to 12 in the United States in 1994-95 followed by three waves of in-home interviews in 1995 (Wave I), 1996 (Wave II) and 2001-02 (Wave III). Current information about these individuals covers the adolescent years (Waves I, II) and their transition to adulthood (Wave III). At Wave III it had been 5 to 6 years since the Add Health cohort was last interviewed and given the demographically dense years of the transition to adulthood, obtaining data on the occurrence of key life events (e.g., union formation, education, work, childbearing) was an important scientific goal of the Wave III follow-up survey.

The Event History Calendar (EHC) was a special feature that was added to the Add Health Wave III questionnaire to enhance accuracy in reporting lifetime event data. The EHC was used as a memory aid during both the CAPI and CASI portions of the interview to help respondents report on the timing and sequencing of events such as romantic relationships, births and pregnancies, marriages, and graduations over the past 5-6 years. This paper describes the purpose, design and field administration of the EHC used in Add Health Wave III, and presents some descriptive analysis that compares EHC data with other independent reports of similar events across interview waves and within the Wave III interview to assess the consistency of EHC data with other survey data.

Add Health Design

Add Health was developed in response to a mandate from the U.S. Congress to fund a study of adolescent health and was designed by a nation-wide team of multidisciplinary investigators

from the social, behavioral, and health sciences. The original purpose of the research program was to help explain the causes of adolescent health and health behavior with special emphasis on the effects of multiple contexts of adolescent life. Innovative features of the research design facilitated this purpose by providing independent measurements of the social environments of adolescents, including contextual data on the family, neighborhood, community, school, friendships, peer groups, and romantic relationships. Data were gathered from adolescents themselves, their parents, siblings, friends, romantic partners, fellow students, and school administrators. Existing data bases with information about the neighborhoods and communities of the adolescents were merged with the Add Health data.

The Add Health cohort was then followed during their transition to adulthood; research questions turned to the meaning of adolescence for trajectories into young adulthood and how adolescent experiences and behaviors are related to social, behavioral, and health outcomes in the transition to adulthood. Across all interview waves, comprehensive data on health and health related behavior were collected, including diet, physical activity, health service use, morbidity, injury, violence, sexual behavior, contraception, sexually transmitted infections, pregnancy and childbearing, suicidal intentions and thoughts, substance use and abuse, and delinquency. Data were also collected on such attributes as height, weight, pubertal development, mental health status, and chronic and disabling conditions. In the transition to adulthood, event history data were collected on relationships, marriage, cohabitation, sexual behavior, childbearing, education, work, and the military.

In-School Administration, Wave I

Add Health used a school-based design. The primary sampling frame was derived from the Quality Education Database (QED). From this frame a stratified sample of 80 high schools was selected (defined as schools with an 11th grade and more than 30 students) with probability

proportional to size. Schools were stratified by region, urbanicity, school type (public, private, parochial), ethnic mix, and size. For each high school selected, a feeder school was identified and recruited (typically a middle school) with probability proportional to its student contribution to the high school, yielding one school pair in each of 80 different communities. More than 70 percent of the originally selected schools agreed to participate in the study. Replacement schools were selected within each stratum until an eligible school or school-pair was found. Overall, 79 percent of the schools contacted agreed to participate in the study. Because some schools spanned grades 7 to 12, the sample contains 132 schools, each associated with one of 80 communities. School size varied from fewer than 100 students to more than 3,000 students. Add Health communities were located in urban, suburban, and rural areas of the country.

From September 1994 until April 1995, in-school questionnaires were administered to students in these schools. Each school administration occurred on a single day within one 45- to 60-minute class period. Add Health collected in-school questionnaires from over 90,000 students. The in-school questionnaire provided measurement on the school context, friendship networks, school activities, future expectations, and a variety of health conditions. An additional purpose of the school questionnaire was to identify and select special supplementary samples of individuals in rare but theoretically crucial categories. Table 1 shows the waves of Add Health interviews, the number of cases in each survey component, and the response rates for the in-home interviews of the Add Health cohort that is being followed prospectively through time.

Adolescent Period, Waves I and II

To sample for in-home interviews, Add Health obtained rosters of all enrolled students in each school. From the union of students on school rosters and students not on rosters who completed in-school questionnaires, a sample of adolescents was chosen for a 90-minute in-home interview constituting the Wave I in-home sample. To form a core sample, students were

stratified in each school by grade and sex and approximately 200 adolescents were sampled from each pair of schools. The core in-home sample is essentially self-weighting, and provides a nationally representative sample of 12,105 American adolescents in grades 7 to 12.

From answers provided on the in-school survey, we drew supplemental samples based on ethnicity (Cuban, Puerto Rican, and Chinese), genetic relatedness to siblings (twins, full sibs, half sibs, and unrelated adolescents living in the same household), adoption status, and disability. We also oversampled black adolescents with highly educated parents. In addition, a special “saturated” sample was included in Wave I by selecting all enrolled students from two large schools and 14 small schools for in-home interviews. Complete social network data were collected in the saturated field-settings by generating a large number of romantic and friendship pairs for which both members of the pair have in-home interviews. These data provide unbiased and complete coverage of the social networks and romantic partnerships in which adolescents are embedded. The core sample plus the special samples produced a sample size of 20,745 adolescents for the in-home Wave I interview (see Table 1).

Seventy-nine percent of all sampled students *in all of the groups* participated in Wave I of the in-home phase of the survey (20,745). A parent, usually the resident mother, also completed a 30-minute op-scan interviewer-assisted interview. Over 85 percent of the parents of participating adolescents completed the parental interview in the first wave. The parent questionnaire gathered data on such topics as heritable health conditions, marriage and marriage-like relationships, involvement in volunteer, civic, or school activities, health-related behaviors, education, employment, household income and economic assistance, parent-adolescent communication and interaction, the parent’s familiarity with the adolescent’s friends and friends’ parents, and neighborhood characteristics.

In 1996, all adolescents in grades 7 through 11 in Wave I (plus 12th graders who were part of the genetic sample and the adopted sample) were followed up one year later for the Wave II in-home interview with a response rate of 88.2% (N=14,738). We conducted the adolescent in-home interviews at Waves I and II using audio-CASI technology (audio-computer assisted self interview) on laptop computers for sensitive health status and health-risk behavior questions. Add Health was the first national study to use ACASI technology in an adolescent population.

Transition to Adulthood, Wave III

In 2001-02, all original Wave I in-home adolescent respondents were recontacted and reinterviewed in a Wave III follow-up, capturing the Add Health cohort during their transition to adulthood when they were aged 18-26. Wave III data collection was conducted nationwide (including Hawaii and Alaska) completing interviews on 15,170 respondents, resulting in a 77.4% response rate (see Table 1). Wave III added several new design features. Quota samples of 500 partners each in married, cohabiting, and dating couples were recruited by Add Health respondents, resulting in the partner sample of 1,507. This sample contains partners who both completed the same Wave III interview. Also new at Wave III was the collection of several biospecimens. Urine and saliva were collected to test for STDs and HIV, and buccal cell DNA was collected from the twins and full siblings in the genetic sample. For the first time in Add Health, Wave III included a CAPI/CASI Event History Calendar, the subject of this paper. Spatial data were again attached to the Wave III individual-level data using the geocodes of the home residence.

The Wave III survey instrument focused on the multiple domains of young adult life that individuals enter during the transition to adulthood, and their well-being in these domains: labor market, higher education, relationships, parenting, civic participation, and community involvement. In the interest of confidentiality, no paper questionnaires were used. As in earlier

waves, data were recorded on laptop computers. For less sensitive material, the interviewer read the questions and entered the respondent's answers. For more sensitive material, the respondent entered his or her own answers in privacy. The average length of a complete interview was 134 minutes. The laptop interview took approximately 90 minutes and was immediately followed by the collection of biological specimens. Most interviews were conducted in respondents' homes. Codebooks for all three waves of Add Health instruments can be downloaded from the Add Health website at <http://www.cpc.unc.edu/projects/addhealth/codebooks>. For additional information on the design of Add Health see Harris et al. 2003.

Purpose of the Add Health Event History Calendar

At Wave III, the Add Health cohort was aged 18-26 in the midst of their transition to adulthood. This is a demographically dense life stage for the occurrence of multiple key life events, and an important scientific goal of Wave III was to record these events in order to map life course transitions and trajectories from adolescence into young adulthood. During the transition to adulthood, adolescents may leave home, enter college, receive training, explore new lifestyles, experience intimate relationships, get married, become parents, enter the labor market, enter the military, and possibly run into trouble with the law. The order and sequencing of these various and multiple events will shape the future adult lives of our sample.

We therefore needed a data collection method to record timing data on multiple life events. However, it had been 5 to 6 years since the last interview with Add Health respondents (either at Wave I or Wave II), and recalling the precise timing of various life events over a 5-6 year period is cognitively challenging (Eisenhower et al. 1991; Tourangeau 1984; 2000; Belli 1998). Given these data demands, use of an event history calendar seemed especially appropriate. EHCs are designed to enhance autobiographical memory of life events by providing

a matrix of visual cues that respondents can use to help them recall the timing and sequence of life events (Freedman et al. 1988, Caspi et al., 1996; Belli 1998; Axinn et al., 1999). These visual cues are structurally displayed in the columns and rows of the EHC matrix, typically column headings are marked with years and/or ages, and rows represent substantive life domains (Axinn et al. 1999; Freedman et al. 1988; Kominski 1990). Once respondents begin to enter the dates or timing of salient life events, these events serve as visual cues that enhance the respondent's ability to recall other events in relation to each other. Thus, EHC methods encourage recall at both thematic and temporal levels which may increase the power of respondents' autobiographical memory (Belli 1998; Bradburn 2000).

However, the design and scientific goals of the Add Health Study posed several other obstacles to an EHC approach. Add Health is an omnibus study funded as a series of Program Projects, covering a broad range of research topics within and across social science, public health, and biomedical disciplines. Competing demands for survey time from the multidisciplinary program project investigators made it impossible to gather complete event histories in multiple domains over a five or six-year period in the Wave III instrument (complete in the sense of recording the occurrence of all events within each substantive domain, such as all jobs in a work history). In addition, from its inception, all in-home interviews with Add Health respondents had been administered on a laptop computer in a CAPI/CASI context, with no paper instruments or supplemental worksheets used. In 1999-2000 when we were developing the Wave III instrument, the majority of EHCs used in social science surveys used paper and pencil formats, with the exception of the CATI EHC developed by Robert Belli (2003) for the Panel Study of Income Dynamics (PSID) and a combined CAPI and ACASI EHC used in the pretest of Cycle 5 of the National Survey of Family Growth (Duffer and Peterson 1996). Thus, the

development of an electronic EHC for the CAPI and CASI context was another hurdle for the use of EHC methods in Wave III of Add Health.

Given these considerations, Add Health opted to develop an electronic EHC that would be used primarily as a memory tool to help respondents recall the dates of events (Bradburn 2000; Kominski 1990; Wiebe and Landis 2000). Unlike most EHCs documented in the survey research literature (Axinn et al. 1999; Caspi et al. 1996; Freedman et al. 1988), the Add Health EHC was not designed to be used as a data collection instrument because complete event histories were not collected for most domains, and we wanted the respondent to have access to the EHC during the CASI sections of the instrument that include reports of sexual behavior, relationships, and pregnancies and their outcomes. We did not want to take on the challenge of developing an electronic EHC for data input by the respondent during the CASI sections because of the risks of data loss or threats to the integrity of the instrument programming.

Therefore, the purpose of the Add Health EHC in Wave III was to enhance accuracy in reporting lifetime event data. The EHC was used as a memory aid during both the CAPI and CASI portions of the interview to help respondents report the dates of key events such as parental death(s), graduations, first job, entry into the military, romantic relationships, pregnancies and births, marriages, and involvement with the criminal justice system. The electronic EHC still has the advantages of traditional EHCs, including the visual representation of calendar time during which events are reported, visual cues of the respondent's age associated with each of the reported events, and the parallel display of substantive life domains that enable the respondent to recall events in one domain in relation to the timing and sequence of events in another domain (Axinn et al. 1999; Belli 1998; Caspi et al. 1996; Freedman et al. 1988). Such advantages enhance autobiographical memory and increase the accuracy of reports on both the timing and sequence of life events.

EHC Design

The Add Health EHC was designed to be a readily available tool to both the interviewer and the respondent that would assist the respondent in recalling dates of key life events, focusing on the respondent's life since early adolescence. The most important aspect of the EHC was that it is understandable and usable to the respondent—not that it be easy for the interviewer to input data. In collaboration with Research Triangle Institute (RTI), the Wave III field contractor, the Add Health team designed the structure of the EHC according to the content, or substantive domains, for which dates of occurrences of life events were needed, and the visual appearance of the EHC on the laptop computer. We envisioned most of the events that we wanted to date would have occurred since the last interview, specifying a 5- or 6-year time frame for the calendar. However, because for some domains we wanted to record the entire history (e.g., childbearing), and some of the events we were dating for the first time (e.g., parental death, juvenile crime), we began the time frame for the EHC in 1990 to cover the majority of the adolescent years. Thus, the calendar's unit was one month, with a time span of 138 months from January 1990 to June 2001.

EHC Data Content

Guided by the scientific purpose of Add Health Wave III, the Add Health project team identified the life domains for which complete event histories were needed. For those domains in which we were not gathering complete histories, we then identified the particular events in these domains for which we wanted to collect specific dates of occurrence. Because one of the strengths of the Add Health Study is its longitudinal relationship data, beginning with the origins of romantic and sexual relationships in early adolescence, we chose to continue to collect a complete relationship history since 1995. Because some of the Wave I respondents (mainly the seniors at Wave I) were not reinterviewed at Wave II in 1996, we decided to begin the time

frame for retrospective reporting of relationship histories in 1995, the time of the Wave I interview (we have relationship histories on all adolescents prior to Wave I).¹

Complementing the relationship histories, we also decided to collect complete marriage, cohabitation, and pregnancy and birth histories over the respondent's life. Because the Add Health sample was still young at Wave III (18-26 years old), we did not expect the collection of these histories to be overly time-consuming or onerous for respondents. Table 2 presents the list of events for which we used the EHC to assist the respondent in accurate reporting of event dates of occurrence. The first column lists the life domain for which event data are collected; the second column lists the type and form of event data collected (primarily dates of occurrence); and the third column shows the time reference for the occurrence of events recorded.

In other key life domains (e.g., education, work), we wanted to use the EHC to help the respondent report the dates of specific events in those domains that would most benefit research in these areas. Note that in order for the respondent to be asked the dates of occurrence of specific life events shown in Table 2, they first passed through a number of screener questions identifying respondents who experienced these events. We do not detail these screener questions here (but they can be seen in the Wave III codebooks at www.cpc.unc.edu/addhealth/codebooks). For example, only those respondents who ever had any romantic or sexual relationship since 1995 are asked about the beginning and ending dates of those relationships. The number of marriages and pregnancies are recorded (and used as data checks in the instrument) before

¹ Relationships at Wave III were defined in the following way, with instructions for filling out the relationship history indexed by the partner. "The next part of the interview is concerned with any romantic relationships and sexual relationships you have had at any time since the summer of 1995. Include relationships that began more than six years ago if they continued at least until June 1995. To keep track of things as you go through this section, please list only the first name, initials, or a nickname of your partner in each such relationship. If you have been involved with the same person more than once, think of this as one relationship rather than as two or three relationships, and list the person only once."

reporting the dates of these events. Only respondents who are still in contact with friends from high school are asked beginning and last contact dates of those friendships; only respondents who have had live births are asked dates about various events associated with each biological child, and so on.

Add Health has a large number of youth in immigrant families due to its design that oversampled certain ethnic groups (Harris 1999). Thus, at Wave III we asked respondents who were not born in the U.S. nor born to U.S. citizens abroad whether they have become a U.S. citizen, and if so, using the EHC, the date they became a citizen. We also wanted to record the date that respondents last lived with their biological parents, and dates of moves to current residence and state. We wanted to use the EHC to help respondents report on the dates of deaths in their family. To provide continuity with friendship data from adolescence in Waves I and II, for ongoing friendships with friends from adolescence, we wanted respondents to report on the dates such friendships began and the date the respondent last saw the friend. Within the education domain, the EHC would be used to report on dates of graduations and degree completion, training certificates, and the beginning date of any current enrollment. For the labor market and military service domains, we wanted to collect the dates of a disability spell that prevented the respondent from working, dates the first job ended and current job began, and dates of military entrance and exit.

Once a complete relationship history was collected in Wave III, the survey instrument was programmed with an algorithm that identify certain relationships for more extensive detailed questions needed for funded program project research (e.g., most important relationship, last three sexual relationships for sexual networking analysis, and relationships that were part of the couple sample). We then used the EHC to collect specific dates of sexual behavior with each partner in these relationships. These data are quite detailed and rich for research on romantic and

sexual relationships. For respondents who had biological children, we wanted to use the EHC to collect dates of child death, child's most recent living arrangements, and most recent parental contact with child. For respondents who indicated they have had contact with the criminal justice system, we used the EHC to record dates of first conviction in juvenile court, adult court, and the most recent conviction. For respondents who indicated they had a mentor who was not a biological parent, we wanted to record the age when the mentor became important in the respondent's life and the date of last contact with the mentor. Finally, at Waves I and II, we asked our adolescent respondents whether they had ever signed a pledge to abstain from sex until marriage (i.e., virginity pledge). At Wave III we wanted to use the EHC to record the date and age at which they signed the pledge.

Electronic presentation of EHC on Laptop

Because the purpose of the electronic EHC was to help the respondent remember and accurately date the occurrence of important events, the most important aspect of the EHC was that it be understandable and usable to the respondent. In addition, EHCs facilitate a more natural conversational framework as the respondent and interviewer work together to fill out the calendar and focus on the interrelationships of events. In collaboration with RTI, we developed a design for the electronic calendar that the interviewers and respondents could easily use and would enjoy using. The majority of EHCs have been developed to display time horizontally, with the time units represented in the columns of the EHC matrix (see Belli et al. 2001; Freedman et al. 1988; Kelly et al. 1996; Kominski 1990). However, because of the long time frame of 5 to 6 years since the last interview, the desire to date events to the month and year, and the electronic context of the Add Health EHC, we also explored a vertical time design for the EHC. These two versions were then evaluated using cognitive testing at RTI (Wiebe and Landis 2000).

EHCs and the conversational style interviewers tend to develop when using them maximize three different types of memory processing that respondents use: top-down, sequential, and parallel processing (Belli 1998). Top-down processing results from people using important domains, such as relationships, family formation, or jobs, to organize their autobiographical memories (Tourangeau 2000). Generally, questionnaires are topically ordered and promote top-down memory processing, even without an EHC. Sequential processing involves the temporal ordering of events within topical domains (Bradburn 2000). This is greatly enhanced by the visual aid of the EHC and by the process of filling out an EHC. Parallel processing is the ability to remember events based on the interrelationships between domains.

We drew on four major considerations from the survey research literature in the design of the horizontal and vertical EHCs. First, the EHC would include landmark events to anchor time periods and reduce forward telescoping (Loftus and Marburger 1983). We developed and presented as part of the calendar “public” landmark events, and encouraged respondents to report on personal landmark events. Second, we used color to specify and distinguish domains (Duffer and Peterson 1996). Third, time intervals were clearly marked (Caspi et al. 1996). We chose to date events to the month and year, and thus the month within each year represented the fundamental time unit for dating life events. Finally, the EHC was designed to maximize three memory-processing methods: top down, sequential, and parallel (Belli 1998). Topic domains were clearly identified and labeled either the rows for the horizontal EHC or the columns for the vertical EHC to use as a conceptual anchor to encourage top-down processing. The time sequence of month within year was marked to encourage sequential memory. To further enhance sequential memory, the EHC is populated with the respondent’s calculated age corresponding to each month in the year when birth date is confirmed at the beginning of the

interview. Finally, we designed the visual organization of the domains so that parallel events could be connected visually as they do conceptually in respondents' autobiographical memories.

Cognitive testing of the horizontal and vertical electronic EHCs revealed that both tools were equally effective in ensuring accuracy in reporting (errors were embedded in the calendars as data were entered and respondents were asked to look for any errors in reviewing their calendar). In addition, most respondents reported both calendars were easy to use, although there was somewhat more preference for the vertical design. Respondents commented that they preferred looking down lists as opposed to across, and that they could more easily see everything in the calendar using the vertical EHC as opposed to the horizontal one. In addition, they reported that it was easier to move across the domains (across columns) in the vertical design. Finally, a preference for the vertical version was expressed by the younger respondents in their 20s compared to the older respondents (over 30), and because the Add Health sample would be aged 18-26 at Wave III, we went with the vertical electronic EHC (Wiebe and Landis 2000).

Once we decided on a vertical time line for the electronic EHC, the content of the data for which dates were to be recorded influenced the final design of the EHC. Because relationship data are the strength of Add Health and complete relationship, marriage, and cohabitation histories were to be collected in Wave III, this was a key domain that was always represented in the EHC. Figure 1 shows a representation of the EHC design we used in Wave III of Add Health.

The EHC was organized into three domain columns: Public Events, where public landmark events were displayed; Personal Events, where personal landmark events were displayed; and Relationships, which displayed the respondent's partner or spouses. The respondent's age was displayed between the public events and personal events columns. It was calculated when the respondent confirmed a pre-loaded birth date or provided a birth date in the

beginning of the questionnaire. The respondent's age is displayed in each month of the EHC, changing in the month of the respondent's birthday (as in Figure 1). The public landmark events were developed from research on the popular and widely-known public events that were especially salient to the adolescents in the Add Health cohort who came of age in the 1990s. The full list of public events is included in Appendix I, covering the time period 1990-2001. Personal events include all other events for which dates are obtained across the other life domains.

EHC Implementation

The EHC was used in both the CAPI and CASI sections of the Wave III questionnaire. Figure 2 presents the list of sections of the Wave III questionnaire. Sections that were pre-programmed to include the EHC display are indicated, as well as whether the section is CASI. In some sections, the EHC was programmed to be displayed as a time reference for questions that asked for a particular status during a time period (e.g., last 12 months, 1995-2001). As the interview began with CAPI sections, the interviewer introduced the EHC to the respondent, described its purpose and demonstrated its use, which served to train the respondent on how to use the calendar during CASI sections. The EHC was displayed automatically each time a respondent is asked to remember dates on which significant life events occurred. The instrument program displayed the EHC in the top half of the laptop screen and showed the question asking for the date of the event in the bottom half of the screen. For example, if the respondent indicated that her residential mother died since the time of the last interview in Section 3 of the interview, the bottom of the laptop screen displayed the following question:

“In what month and year did she die?”
month _____
year _____

For the most part, the calendar display started, by default, at June 1995. The respondent could request that the calendar be scrolled back or forth in time to view the public events or other personal or relationship events already entered into the calendar to aid in recalling the event date. The interviewer entered the reported month and year in the answer line at the bottom of the screen. Once the month and year of resident mother's death were entered, "death of resident mother" would appear under the domain of "Personal Events" in the EHC corresponding to the reported month and year of death along the vertical timeline in the left-most column, and corresponding to the age of the respondent at the time of her death. The visual representation of the time of her death and its correspondence with the respondent's age, public events that occurred around the time of her death, and any other personal events that occurred around this time allow the respondent to more accurately recollect this event and further assess its accuracy once she sees it displayed on the EHC.

The interviewer and respondent worked together during the CAPI section of the Wave III instrument to answer questions that marked key events on the calendar. When the calendar was first displayed to the respondent, the time line beginning 1990, list of public events, and age were the only visual cues. From that point on, the bulk of information came from the respondents' answers about important life events during the Wave III interview. For example, if the respondent reported a marriage, both the event and the date of that event were recorded in the EHC. The instrument program compiled these life events in a database that was accessible to the respondent at key points in the interview. As the respondent continued to add life events in the computer database, those events appeared in the date order on the calendar.

The personal and relationship entries are made in the calendar as the respondent answered month/year questions. When respondents were unable to provide a month, they were asked to provide a season, and interviewers were instructed to enter the middle month of the

season for the event. In addition to the automatic EHC display for date questions, the EHC was always available for the respondent to consult using a function key.² The EHC was also automatically displayed whenever a response required an age (i.e., “How old were you when....?”). When two events (or more) occurred in the same month, the EHC added a line to the EHC repeating that month so that each event had a distinct entry in the calendar corresponding to the same month, year, public event, and age.

Twice during the interview, the respondent was asked to verify that calendar entries to that point were correct. The first review occurred with the interviewer at the end of section 15 on Economics and Personal Future, before starting the CASI part of the interview (see Figure 2). At this point the interviewers prepared respondents for use of the EHC in the CASI sections, showing the respondent how to bring up the calendar at any point during the interview to use as a memory aid or to check a previous answer. The second review occurred at the end of the CASI interview, after section 29 on Mistreatment by Adults, but before program control was returned to the interviewer.

Corrections to the EHC could be made at any time during the interview, but most often occurred during the two review points. By highlighting a personal entry in the calendar, the interviewer (or the respondent in CASI) gained access to the questionnaire item that it represented, with the opportunity to change the answer to that question item. To begin the process of changing a date, the interviewer (or respondent) would highlight the text in the EHC that corresponded to the event for which the date was incorrect. A separate window then appeared containing the highlighted text and the incorrect date. The interviewer (or respondent) then replaced the incorrect portion of the date. The event was moved from the old, incorrect date

² The F9 key was used to bring up the calendar whenever the respondent wanted it available in the top half of the computer screen, and also to “get into” the calendar for scrolling and other purposes (e.g., correcting or editing dates of events).

on the EHC to the new, corrected month and year. A flag was then added to the output data file indicating that the value for the item was corrected, and the new date value was used to overwrite the old one in the output data file.

If the respondent reported a life event date that contradicted another event date, the interviewer used the EHC to help the respondent correctly position each event along the timeline. A date in the EHC could not be deleted. If a respondent wanted to delete a date, the item was deleted from the screen, but the value of the date remained in the output data file, and a flag was added indicating that the respondent wanted to make the deletion. Any change to a date that caused an entry to be written in the calendar must change the position of the calendar entry. A record was kept of the number of changes to each date that is represented in the EHC, for which a cumulative count of the number of changes to EHC dates can be computed. We envisioned these data could be used to assess and perhaps adjust for the quality of the respondent's EHC data.

Consistency of EHC with Standard Q&A Survey Data

We have conducted some descriptive analysis of the consistency between reported dates in the EHC and dates reported for the same event in other survey components of the Add Health Study. We have three sources of survey data with which to compare Wave III EHC data: earlier waves of the Add Health Study, administrative data from the high school transcripts of Add Health respondents, and other survey data within the Wave III interview. For each analysis, we had to subset the Add Health sample to those respondents who experienced some event (e.g., marriage, a birth) or report on event occurrence at the two survey comparison points in order to assess the consistency of the reports. We therefore chose to conduct our consistency analyses using data

for which we had a sufficient number of respondents experiencing the event, and for which the most direct comparison of event dates or ages could be made.

Death of Biological Parent

The first analysis examines consistency in reports of the age of the respondent at the death of a biological parent. Results are shown in Table 3, and the interview questions from which the data are derived are shown in the bottom of the table. There are several sources of data for the age of respondent at the death of a parent. In Wave III, both the age of the respondent when a biological parent died and the date of death of a parent were asked, with the date appearing on the EHC. At Wave I, if the respondent had lost a biological parent, we collected the age of the respondent at the time of parental death. Thus, our main comparison is the age at the death of a parent. From the date of death of parent reported on the EHC in Wave III, we have calculated the age of the respondent at the time of death. In the top panel of Table 3, we examine the extent to which the calculated age (based on the date of death) agrees with the reported age when both reports come from the Wave III interview. We show results for this consistency match for the death of biological mothers and biological fathers and further break down the results by sex of respondent.

Our analyses also varies the “window” of time within which we consider a consistency match to occur. Thus, among male respondents who reported that their biological mother died at Wave III, the calculated age of the respondent from the date of death they report on the EHC and the reported age at mother death matched exactly for 65.7 percent of the 102 male respondents (N shown in parentheses). When we extend the window to allow for a match that is within one year of reported and calculated ages (plus or minus one year of age), the match percent increases to 94.1%. The consistency between the calculated age and reported age at the death of a mother is similar for females respondents, with 65.4% with an exact match in the age and 94.7%

matching within one year of the age at death of mother. The match percent for age at death of biological father is not as high for male respondents. Among the 277 male respondents whose biological father died, there is a 59.2% exact match between the calculated age from the date of father's death and the reported age of the respondent at the time of father's death. When we allow for the match to occur within one year of the two ages, the match percent increases to 91%, still a bit lower than the 1-year window match for mother death. Among female respondents, the match between calculated age and reported age of the respondent at father's death are similar to the match for mother death. In general, the consistency of respondent age at the death of a biological parent reported by the date of death or age at death is relatively high, especially among females who lost a biological parent.

In the middle panel, we examine the consistency in reports of respondent's age at the death of a biological parent between Wave I and Wave III for those respondents who lost a parent before Wave I. We compare the reported age of respondent when the parent died at Wave I with 1) calculated age from the date of parental death reported on the EHC at Wave III, and 2) reported age at death of parent from Wave III. There are three patterns to the results. Exact matches of the age at parental death are lower when the time frame for recall is longer, i.e., parental death occurred prior to adolescence (compare the first panel with the middle panel). Second, exact matches are also lower when the match is between the Wave III calculated age based on the date rather than the Wave III reported age (compare the two rows). Females demonstrate a higher level of consistency in reporting across time than males, with a higher percent of exact matches based on both the Wave III calculated age and the reported age with the Wave I age at death of parent. Although the exact match percentages are lower in the across-wave longitudinal time frame for recall, extending the window to allow for a match within one year of the age at death increases the consistency considerably. While the within-Wave III

consistency was over 90% with the extended 1-year window (top panel), the across wave consistency was over 85% (middle panel).

In the bottom panel of Table 3 we examine the across-wave correlation between the Wave III calculated age and reported age at parental death and the Wave I reported age at parental death for those respondents whose parent died before Wave I. The correlations are quite high for mother death, and do not vary by sex of respondent. The correlations are somewhat lower for male respondents whose father died.

High School Graduation

During the Wave III interview, Add Health obtained consent from 91% of its respondents to collect their high school transcripts, and transcripts were subsequently collected for 88% of those who consented. Data from the transcripts were eventually coded and merged with Add Health data. The date of high school graduation is therefore available from this extant source to compare to the reported date of high school graduation on the EHC. Table 4 shows the results of the consistency analysis of these two dates for those respondents who have high school transcript data. The consistency of high school graduation date is fairly high, given these two independent sources of the graduation date. An exact match is found in the month and year of high school graduation for 69% of respondents. When we extend the window for the match to be within 3 months, the match increases significantly to 95.2%. Further extensions of the window increase the match marginally to 98.4% when we allow the match to occur with 1 year.

First Pregnancy

Table 5 shows consistency in the dates of first pregnancies reported by women at Wave II in adolescence and Wave III using the EHC. This analysis is therefore restricted to women who had a first pregnancy prior to Wave II (1996), primarily in adolescence. Questions used to obtain pregnancy dates are shown in the bottom of Table 6. Because the EHC in Wave III only

collected the end date and outcome of pregnancies, we estimated the begin date using standard lengths of gestation time conditional on the pregnancy outcome (e.g., 2 months for abortion or miscarriage prior to end date, 5 months for still birth). To allow for some error in using the standard length of gestation time by pregnancy outcome, we defined an exact match in begin dates to be within 1 month (plus or minus 1 month of the two dates).

The results show that exact matches of both begin and end dates are not that common. An exact match in the begin date of the first pregnancy occurred for more than half of the sample (53.5%), but less than half (42.4%) matched on first pregnancy end date. One would expect a higher match on the end date since that is the date of the outcome, but perhaps the additional 1-month window we use for the match on begin date helped our consistency rate. When we extend the window for a match to be within 1 year, consistency increases considerably with more than three-quarters of the sample now agreeing on both begin and end dates of first pregnancy.

In Table 6 we explore the consistency of first pregnancy outcome reports from Wave II and Wave III. We show the percent distribution of the match (and non-match) in outcomes at Waves II and III, collapsing miscarriage, abortion and still births together into one outcome category. We find relatively high consistency in the first pregnancy outcomes reported at Wave II and Wave III, with over 86% matching. Among the 13.8% that do not match, the majority reported a miscarriage, abortion or still birth at Wave II in adolescence, but a live birth for their first pregnancy outcome at Wave III (11.7%). We suspect the earlier Wave II reported pregnancy outcome was “forgotten” and not reported at Wave III, consistent with the pattern of under-reporting pregnancies that result in abortion or miscarriage (Fu et al. 1998) (thus the pregnancy outcome at Wave III is likely to be a second, or higher-order, pregnancy outcome).

First Marriage

Table 7 presents results on the consistency of first marriage date for male and female respondents who married prior to either Wave I or Wave II. The dates of first marriage are asked in both the Wave I and Wave II interviews, when respondents were still in adolescence, and at Wave III in the EHC. We have pooled respondents who married prior to Wave I with those who married between Wave I and Wave II to increase our sample size for the consistency analysis. Even so, we only have 31 males and 88 females who married prior to Wave II. Consistency of first marriage date is moderate overall, with females showing better recall. Consistency within a 6-month window for matching month and year of first marriage is 61.3% for males and 68.2% for females. When we extend the window for matching to be within one year of the two dates, the increase is moderate for males (71%) but substantial for females (84.1%).

Virginity Pledge

In the Wave I and Wave II interviews, Add Health included a question asking non-married adolescents whether they had taken a public or written pledge to remain a virgin until marriage, with a yes/no response. This question was repeated in Wave III, asking everyone whether they had ever taken the pledge. If the response was yes, respondents were then asked the date (and if they could not recall the month and year, the age) of signing the pledge using the EHC. Although analyzing consistency in these data across waves is not as straightforward as in previous analyses, we show results of our attempt in Table 8. We categorized the sample into two groups: those who reported not signing the pledge at Waves I/II, but having ever signed the pledge by Wave III (Panel A in Table 8); and those who reported signing the pledge at Wave I/II and also reported ever signing the pledge at Wave III (Panel B). We then examine separately consistency in the Wave I and Wave III reports and the Wave II and Wave III reports, using both the date and age at pledging from the EHC at Wave III.

Among those who report no pledge at Wave I/II and ever pledging by Wave III in Panel A, a consistent report is one where the date (or age) of pledging occurred between the Wave I/II and Wave III interview. We find that 66.5% of respondents consistently report the date of pledging and 72.9% consistently report the age of pledging to occur exactly between the Wave I and Wave III interviews for those who report no pledge at Wave I. When we extend the window to allow the match to occur within 6 months of the interview dates, the consistency of these reports increase to 72.5%. We extend the window for a match on age at pledging to 1 year, increasing consistency to 81.3%. The matches of date and age when the pledge occurred between Wave II and Wave III indicate somewhat lower consistency (second set of comparisons in Panel A). We suspect this occurs because of the shorter time frame within which a pledge could occur (4-5 years between Waves II and III rather than 5-6 years between Waves I and III).

Turning to the bottom Panel B, we now examine consistency in pledging reports among those who reported that they pledged at Wave I/II and ever pledged at Wave III. In this case, a consistent report is one where the date (and age) of pledging reported on the EHC occurred prior to the Wave I/II interview. Since the event of pledging occurred earlier in the life course and farther away from the Wave III interview, we expect recall to be more difficult and consistency to be somewhat lower. Our results confirm this expectation. A little over half (55.4%) correctly report a pledge date prior to the Wave I interview, and this percentage increases slightly to 62.6% when we extend the window for comparison of interview and pledge dates to be within 6 months of each other. As in Panel A, recalling the age is somewhat easier for respondents, increasing the consistency of reports across waves. Consistent reports are found for 63.8% who report an age of pledging prior to the age at the Wave I interview, and this percentage increases to 79.1% when we extend the window for a consistency match to be within one year of the two ages.

When we examine reports of pledging for those who pledged before Wave II, we find consistency to increase, probably because the pledge date and age occurred more recently than it did when it occurred prior to Wave I. Here, the lowest level of consistency is 66.6% (EHC date of pledge reported to occur exactly prior to Wave II interview date) and the highest level is 86.3% (EHC age of pledge reported to occur within one year of age at the Wave II interview). In general, these levels of consistency are moderate to high for an event that is probably meaningful in adolescence, but becomes less so as young people enter young adulthood (at least compared to parental death, marriage, or childbearing). However, it is important to note that our sample does not include all those with inconsistent reporting of the pledge, such as those who report pledging at Wave I/II and never pledging at Wave III.

Current Job

In the final analysis shown in Table 9, we report on the degree to which the reports of the start date of the current job matches with survey questions on work status from 1995 (Wave I interview) to 2001 (Wave III interview), both asked within the Wave III interview. This analysis is fairly rough, but does allow us to assess consistency of EHC data obtained in the labor market domain. Among those who are currently working at Wave III, they are asked for the start date of their current job using the EHC. In another part of the questionnaire, respondents are asked to indicate whether they worked (for 20 hours or more a week) during each year since 1995 to the current year. We therefore compare the job start year with the work status for that year and indicate a match if the job status is working in that year. These results are shown in the first column of Table 9. We see that agreement is quite high (all over 95%), and consistency in reports increase with a more recent job start year, relative to the Wave III interview year.

Because we can calculate the length of time the respondent has been working in the current job assuming continuous work status from the start year of current job to the Wave III

interview year, we also compare the duration of current job from the start date to the year of the Wave III interview with the duration of work status (summing across years of work from start job year to the year of the Wave III interview). We again find agreement of these reports to be high, over 90% and increasing in agreement as the start date of the current job nears the Wave III interview date.

Conclusion

The EHC in Add Health Wave III was designed and implemented to improve the accuracy of reporting the timing and sequence of lifetime events. In Wave III, the Add Health cohort was navigating their transition into young adulthood and experiencing critical life events that would set them on life trajectories through adulthood. Dates of events that had occurred since the last interview in adolescence were of particular importance to Add Health researchers in the domains of romantic and sexual relationships and education, as well as the occurrence of significant lifetime events including marriage, childbearing, crime, parental death, and disability. Thus, the timeframe for recall of events was long, generally covering the last 5-6 years, and for some events, prior to adolescence. The EHC calendar was implemented to enhance accuracy in retrospective reporting of lifetime event data.

Add Health had several obstacles to overcome in its development of its EHC, including the long time frame, competing demands for interview space and domains from multiple disciplinary project investigators, a limited amount of interview time to be devoted to gathering event histories, and the development of a CAPI/CASI electronic calendar. Add Health was one of the first studies to develop an electronic calendar that was accessible to the respondent in the self-administered confidential portions of the interview. Cognitive testing of several versions of

an electronic EHC indicated that respondents liked using the calendar and interviewers found it to be an effective data collection aid.

The EHC was used extensively throughout the survey instrument. The interviewer introduced the calendar to the respondent in the CAPI sections of the interview, and then instructed the respondent on its use for the CASI sections. The calendar was not used for data input, only as a memory aid with visual cues of the time period, corresponding respondent age, and events displayed in key life domains in temporal order. The EHC was assessable to the respondent at any time during the interview to assist in event recall or to check on a previous date entered into the calendar. The events entered onto the calendar were reviewed twice during the interview, once with the interviewer present, and the second time during the end of the CASI section. Changes or corrections to calendar events could be made at any time, and a record of the number of changes was recorded for each respondent.

In descriptive analysis, data from the EHC were compared with similar data reported from earlier waves of the study, from other parts of the survey during Wave III, or derived from extant sources to assess the consistency of reports. These analyses were selective in the kinds of events examined because similar data on the same events were required. In addition, the sample was necessarily restricted to respondents who had experienced the event at both time points of comparison, limiting the sample considerably for such events as marriage or childbearing given that the Add Health study began in adolescence. Moreover, these analyses can only assess the consistency of reports, and are not able to discern which data source is more accurate when reports are inconsistent. That is, without an experimental design, we are not able to assess whether the EHC data are more accurate than data from the standard Q&A format at Wave III or in earlier waves. We assume that the longer ago an event occurred, the less accurate is the reporting. However, we also assume that use of the EHC helps to enhance accuracy in

retrospective reporting of events that occurred a long time ago better than a standard Q&A approach.

Our results indicate that the consistency of EHC data with other survey data on the same events was relatively high. When consistency between dates reported in adolescence during either Wave I or II and dates reported on the EHC at Wave III is assessed for an exact match, consistency is the lowest, averaging 50% for most events. However, when we extend the window within which we allow a match to occur, consistency rises, often considerably to 75-90%. Females tend to be better at recalling dates of parental death and marriage. Greater consistency overall is found for the events of high school graduation and marriage. In addition, the consistency of current job start dates with reports of work status are very high. When dates of event occurrence are compared with age of event occurrence, consistency is high, especially if the data sources come from the same survey wave (Wave III). Finally, the longer the gap between the two reports of the same event, the lower the consistency. Although respondents may not be able to identify the exact dates, especially month and year of events, they seem to do well at getting close to the event time, especially the year in which events occurred or the age at which events occurred. The result is relatively high overall consistency between EHC data and data from other survey waves and administrative records.

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Figure 1. Event History Calendar Design

Year	Month	Public Events	Age	Personal Events	Relationships
1998	8	US embassies in Africa bombed	15	Moved to Alabama	
1998	9	McGwire breaks home-run record	15		
1998	10	Matthew Shepard murdered	15		Dating Jason
1998	11	Jesse Ventura elected governor	16		
1998	12	Bill Clinton impeached	16	First job	
1999	1	Michael Jordan retires	16		Ended Jason
1999	2	Jerry Falwell outs Teletubby	16		
1999	3	Joe DiMaggio dies	16		Dating Seth
1999	4	Columbine High School shooting	16	Signed pledge	
1999	5	Star Wars: Episode 1 released	16		

Figure 2. Questionnaire Sections of the Wave III In-Home Interview (2001-2002)

Section 1	Overview and Demographics	EHC
Section 2	Household Roster and Residence History	EHC
Section 3	Parental Support and Relationships	EHC
Section 4	Retrospective Attention Deficit Hyperactivity Disorder	
Section 5	Relationships with Siblings	EHC
Section 6	Friends	EHC
Section 7	Education	EHC
Section 8	Labor Market Experiences and Active-Duty Military Service	EHC
Section 9	General Health and Diet	
Section 10	Access to Health Services, Health Insurance	Display EHC ¹
Section 11	Illnesses, Medications, and Physical Disabilities	
Section 12	Social Psychology and Mental Health	
Section 13	Mentoring	EHC
Section 14	Marriage/Co-habitation History and Attitudes	EHC
Section 15	Economics and Personal Future	Display EHC ²
	<i>Review EHC dates for accuracy</i>	
Section 16	Sexual Experiences and Sexually Transmitted Diseases (STDs) ‡	
Section 17	Compiling a Table of Relationships ‡	EHC
Section 18	Compiling a Table of Pregnancies ‡	EHC
Section 19	Relationships in Detail ‡	EHC
Section 20	BEM Inventory ‡	
Section 21	Propensity for Risk ‡	
Section 22	Completed Pregnancies ‡	EHC
Section 23	Current Pregnancies ‡	EHC
Section 24	Live Births ‡	EHC
Section 25	Children and Parenting ‡	EHC
Section 26	Delinquency and Violence ‡	
Section 27	Involvement with Criminal Justice System ‡	EHC
Section 28	Tobacco, Alcohol, Drugs, Self-Image ‡	
Section 29	Mistreatment by Adults ‡	EHC
	<i>Review EHC dates for accuracy ‡</i>	
Section 30	Civic Participation and Citizenship	
Section 31	Religion and Spirituality	
Section 32	Gambling	
Section 33	Daily Activities	
Section 34	Biospecimen Participation	
Section 35	Interviewer's Report	

‡ CASI

¹ EHC displayed for questions on health care use and access in last 12 months.

² EHC displayed for questions on welfare use from 1995-2001.

Table 1. Waves of Add Health Data Collection and Interviews

<i>Interview wave (date)</i>	<i>Interview</i>	<i>N</i>	<i>Response Rate</i>
Wave I (1994-1995)	In-School Adolescent	90,118	79%
	School Administrator	144	
	In-Home Adolescent	20,745	
	In-Home Parent	17,670	
Wave II (1996)	In-Home Adolescent	14,738	88%
	School Administrator	128	
Wave III (2001-2002)	In-Home Young Adult	15,197	77%
	Partner	1,507	
Wave IV (2007-2008)	In-Home Young Adult	17,000*	85%*

* Projected

Table 2. Event History Data Collected at Wave III Using EHC

Domain	Data collected	Time Frame
<i>Complete histories:</i>		
Relationships	Beginning and ending dates	Since 1995
Marriage	Beginning and ending dates	Lifetime
Cohabitation	Beginning and ending dates	Lifetime
Pregnancies	End date and pregnancy outcome (i.e., births)	Lifetime
<i>Specific Events:</i>		
Demographic	<i>Date:</i>	
	Became a U.S. citizen	Lifetime
	Last lived with birth parents	Lifetime
	Moved to current residence	Lifetime
	Moved to current state	Lifetime
Household	Moved to previous state	Lifetime
	Residential mother died	Since last interview
	Residential father died	Since last interview
	Birth mother died	Lifetime
	Birth father died	Lifetime
Friends	Sibling died	Lifetime
	Friendship with {Friend's name} began ¹	Lifetime
Education	Last saw {friend's name}	Since 1995
	Received GED	Lifetime
	Received high school diploma	Lifetime
	Received associate degree	Lifetime
	Received bachelor's degree	Lifetime
	Received master's degree	Lifetime
	Received doctoral degree	Lifetime
	Received professional degree	Lifetime
Enrolled in current school	Lifetime	
Labor Market and Active Duty Military Service	Received training certificate	Lifetime
	Disability began	Lifetime
	Disability ended	Lifetime
	First job ended	Lifetime
	Current job began	Lifetime
	Current military service began	Lifetime
Relationships in Detail (for up to 5 relationships)	Prior military service ended	Lifetime
	Romance with {partner} began	Lifetime {partner}
	Sex with {partner} began	Lifetime {partner}
	Married {partner}	Lifetime {partner}
	Vaginal intercourse with {partner}	Lifetime {partner}
	Most recent vaginal intercourse with {partner}	Lifetime {partner}
Other types of sex {partner}	Lifetime {partner}	

Domain	Data collected	Time Frame
Children	{Child} died	Lifetime {child}
	Last lived with {child}	Lifetime {child}
	Last lived with {child's parent}	Lifetime {child}
	{Child's parent} last saw child	Lifetime {child}
	Last saw {child}	Lifetime {child}
Crime	First convicted in juvenile court	Lifetime
	First convicted in adult court	Lifetime
	Most recent conviction	Lifetime
Mentor	[Age] when mentor became important in life	Lifetime
	Last contact with mentor	Lifetime
Virginity Pledge	Signed virginity pledge	Lifetime
	[Age] signed virginity pledge	Lifetime

¹ Friends' names preloaded from friends in school at Wave I

Table 3. Consistency in Age When Biological Parents Died (Ns in parentheses)

	Mother Died				Father Died			
	Male respondents		Female respondents		Male respondents		Female respondents	
Within Wave III:								
Calculated Age (based on Date) as compared with Reported Age	Exact Match	Within 1 Year						
	65.7 (102)	94.1 (102)	65.4 (133)	94.7 (133)	59.2 (277)	91.0 (277)	68.5 (390)	95.1 (390)
Wave I Consistency with Wave III: Deaths occurred prior to Wave I								
Wave III Calculated Age (based on Date)	49.3 (67)	89.6 (67)	58.3 (96)	87.5 (96)	54.0 (163)	84.7 (163)	60.1 (253)	86.2 (253)
Wave III Reported Age	59.2 (71)	85.9 (71)	67.7 (99)	91.9 (99)	60.00 (180)	86.7 (180)	70.5 (264)	92.8 (264)
Correlation between Wave I and Wave III Age								
Wave III Calculated Age (based on Date)	Wave I Reported Age							
	.9798 (67)		.9550 (96)		.9113 (163)		.9642 (253)	
Wave III Reported Age	.9802 (71)		.9854 (99)		.9186 (180)		.9784 (264)	

Wave I Questions: Do you know anything about your biological father/mother? Is he/she still living?
How old were you when he/she died?

Wave III Questions: : Do you know anything about your biological father/mother? Is he/she still living?
How old were you when he/she died? In what month/year did he/she died (EHC)?

Table 4. Consistency in High School Graduation Dates from EHC and High School Transcript.

Match on	Exact Match	Within 3 months	Within 6 months	Within 1 Year
Graduation Date (Month/Year)	69.0 (9,668)	95.2 (9,668)	96.4 (9,668)	98.4 (9,668)

Wave III Questions: What degrees or diplomas have you received? Indicate all that apply. In what month and year did you receive your high school diploma?

Table 5. First Pregnancy (Women only¹), Wave II and Wave III.

Match between Wave II and Wave III Pregnancy Dates	Pregnancy Begin Date		Pregnancy End Date	
	Exact Match ²	Within 1 Year	Exact Match	Within 1 Year
	53.5 (357)	75.9 (357)	42.4 (354)	76.8 (354)

¹ These are the women who participated in Wave III and whose first pregnancies were also recorded in Wave II with valid pregnancy begin/end dates.

² Pregnancy begin date from Wave III is estimated from pregnancy outcome with end date (abortion or miscarriage: 2 months prior to end date; still birth or multiple with no live birth: 5 months prior; live birth or multiple live birth: 8 months prior) . Exact match is within 1 month.

Table 6. Consistency of First Pregnancy Outcome Reports, Wave II and Wave III.

Wave II	Wave III	%	Ns
Consistent match: 86.3%			
Still pregnant	All outcomes are considered possible and therefore consistent	19.4	73
Miscarriage, abortion, still birth	Miscarriage, abortion, still birth	21.5	81
Live birth	Live birth (including multiple)	45.4	171
Inconsistent reporting: 13.8%			
Live birth	Miscarriage, abortion, still birth, multiple but no live birth	2.1	8
Miscarriage, abortion, still birth	Live birth (including multiple)	11.7	44
Total N		100.1	377

Wave II Pregnancy Questions:

Have you ever been pregnant? How many times have you been pregnant? In what month and year did your pregnancy begin (asked in the order of most recent, second most recent, etc.)? For each of the pregnancy reported, ask: In what month and year the pregnancy end and how did the pregnancy end.

Wave III Pregnancy Questions:

Respondents were asked to list all romantic and sexual relationships he/she had since summer of 1995, and any other relationships involving a pregnancy at any time. For each partner listed, respondents were asked how many pregnancies occurred with partner. For each pregnancy listed, respondents were asked to report the month and year of pregnancy end date and outcome.

Table 7. Consistency in First Marriage Dates Reported at Wave I/II and with EHC at Wave III. (Respondents who participated in Waves I and III and married prior to Wave I or Wave II)

Marriage Dates reported in Wave I/II as compared with reporting in Wave III.	Within 6 months		Within 1 year	
	Male respondents	Female respondents	Male respondents	Female respondents
	61.3 (31)	68.2 (88)	71.0 (31)	84.1 (88)

Wave I Questions: (If age \geq 15) Have you ever been married? In what month and year were you married for the first time?

Wave II Questions: (If age \geq 15) Since {last interview date}, did you get married? In what month and year did you get married?

Wave III Questions: How many times have you been married? First marriage: in what month and year were you married?

Table 8. Consistency of Date for Virginity Pledge

A. No Pledge at Wave I/II and Pledge at Wave III		
Wave I and Wave III Comparison:		
	% Who Reported EHC Pledged Date/Age between Wave I and III	
Date Comparison	<i>Exact</i>	<i>Within 6 months</i>
	66.5 (421)	72.5 (421)
Age Comparison	<i>Exact</i>	<i>Within 1 year</i>
	72.9 (491)	81.3 (491)
Wave II and Wave III Comparisons:		
	% Who Reported EHC Pledged Date between Wave II and III	
Date Comparison	<i>Exact</i>	<i>Within 6 months</i>
	57.2 (306)	64.1 (306)
Age Comparison	<i>Exact</i>	<i>Within 1 year</i>
	62.9 (358)	76.3 (358)
B. Pledged at Wave I/II and Pledge at Wave III		
Wave I and Wave III Comparison:		
	% Who Reported EHC Pledged Date/Age prior to Wave I	
Date Comparison	<i>Exact</i>	<i>Within 6 months</i>
	55.4 (446)	62.6 (446)
Age Comparison	<i>Exact</i>	<i>Within 1 year</i>
	63.8 (508)	79.1 (508)
Wave II and Wave III Comparisons:		
	% Who Reported EHC Pledged Date/Age prior to Wave II	
Date Comparison	<i>Exact</i>	<i>Within 6 months</i>
	66.6 (377)	74.3 (377)
Age Comparison	<i>Exact</i>	<i>Within 1 year</i>
	74.8 (432)	86.3 (432)

Wave I Question: (If R is not married): Have you taken a public or written pledge to remain a virgin until marriage?
 Wave II Question: (If R is not married): Have you taken a public or written pledge to remain a virgin until marriage?
 Wave III Questions: Have you ever signed a pledge to abstain from sex until marriage? In what month and year did you sign this pledge? (If R doesn't know month/year): How old were you when you signed it?

Table 9. Consistency of Current Job Date and Work Status

Year	Current Job Start Year	Ns	Consistent Duration¹ of Current Job	Ns
1995	96.1	128	92.7	246
1996	96.8	314	96.8	560
1997	97.6	464	97.4	1023
1998	97.5	810	97.9	1835
1999	98.1	1419	98.3	3255
2000	98.9	2527	98.9	5756
2001	97.4	4406	98.5	10207

¹ Assumes continuous work status from begin date to interview date.

Wave III Questions: At how many jobs are you now working for pay? If more than 1 job, the next questions refer to your main job—that is, the job where you work the most hours. In what month and year did you start this job? ...

Lastly, I need for you to summarize your work experience from 1995 to the present, by year. Please count only jobs that lasted for three months or more and at which you worked at least 20 hours a week. In 1995, when you were < age in 1995 > years old, did you work for pay? Questions repeated for the years 1996-2001.

Appendix I. Public Events in Add Health Event History Calendar

Year	Month	Public Event
1990	1	Communism falls in Yugoslavia
1990	2	Communism falls in USSR
1990	4	PRETTY WOMAN released
1990	5	Jim Henson dies
1990	7	Marion Barry smokes crack
1990	8	East/West Germany reunited
1990	11	Magic Johnson says he has AIDS
1990	12	Madonna's JUSTIFY MY LOVE
1991	1	Operation Desert Storm
1991	2	Cease fire ends Gulf War
1991	3	Eric Clapton's son dies
1991	4	Wm Kennedy Smith sex scandal
1991	5	TRUTH OR DARE released
1991	6	Mount Pinatubo erupts
1991	7	First Lollapalooza tour opens
1991	8	Lithuania/Latvia independent
1991	10	Anita Hill accuses Clarence Thomas
1991	11	Terry Waite freed in Lebanon
1991	12	Terrorists free Terry Anderson
1992	2	WAYNE'S WORLD released
1992	3	SILENCE OF THE LAMBS Oscar
1992	4	Rodney King verdict: LA riots
1992	5	Quayle blasts Murphy Brown
1992	6	Quayle misspells "potato"
1992	7	Barcelona Olympics open
1992	8	Dream Team wins gold
1992	9	Magic returns to the Lakers
1992	10	SEX by Madonna is published
1992	11	Bill Clinton elected president
1992	12	Charles and Di separate
1993	1	Clinton sworn in as president
1993	2	World Trade Center bombed
1993	4	Fire kills Branch Davidians
1993	5	Last episode of CHEERS
1993	6	Wife amputates Bobbitt's penis
1993	8	Letterman leaves NBC for CBS
1993	10	River Phoenix dies
1993	11	European Union formed
1993	12	NIRVANA UNPLUGGED airs on MTV
1994	1	Serbs pound Sarajevo
1994	2	Lillehammer Olympics begin
1994	3	SCHINDLER'S LIST wins Oscar
1994	4	Kurt Cobain commits suicide
1994	5	Paula Jones sues Bill Clinton
1994	6	NY Rangers win Stanley Cup
1994	7	FORREST GUMP released
1994	8	Woodstock 1994

1994	9	Baseball strike: no Series
1994	10	PULP FICTION opens in theaters
1994	11	Susan Smith says sons kidnaped
1994	12	Richard Gere/C. Crawford split
1995	1	Earthquake in Japan: 5,000 dead
1995	2	Transpacific balloon flight
1995	3	Americans to Mir Space Station
1995	4	Oklahoma City bombing
1995	5	Baseball returns after strike
1995	6	OJ's "gloves don't fit" ploy
1995	7	Heat wave kills 800
1995	8	Jerry Garcia dies
1995	9	Ripken breaks Gehrig's record
1995	10	Braves win World Series
1995	11	Beatles release "new" single
1995	12	Bosnia/Croatia sign treaty
1996	1	Dallas wins Super Bowl
1996	2	Suicide bomber in Sri Lanka
1996	3	Charles and Di divorce
1996	4	Ted Kaczynski is Unabomber
1996	5	Valujet crash in Everglades
1996	6	HUNCHBACK OF NOTRE DAME movie
1996	7	Atlanta's Olympic Park bombed
1996	8	Four women enter the Citadel
1996	9	Tupac Shakur fatally shot
1996	10	Yankees win World Series
1996	11	Bill Clinton re-elected
1996	12	SCREAM opens in theaters
1997	1	Ennis Cosby murdered
1997	2	STAR WARS re-released
1997	3	Hale-Bopp comet appears
1997	4	Tiger Woods wins Masters
1997	5	First Lilith Fair tour
1997	6	Bulls win 5th NBA title
1997	7	Pathfinder lands on Mars
1997	8	Princess Di dies in car crash
1997	9	Mother Teresa dies
1997	10	British nanny guilty of murder
1997	11	McCaughy septuplets born
1997	12	TITANIC opens in theaters
1998	1	Neb/Mich-football co-champions
1998	2	US jet cuts Italian ski cable
1998	3	Kentucky NCAA basketball champ
1998	4	Viagra on market
1998	5	Last SEINFELD episode
1998	6	Bulls win 6th NBA title
1998	7	France hosts/wins World Cup
1998	8	US embassies in Africa bombed
1998	9	McGwire breaks home-run record
1998	10	Matthew Shepard murdered
1998	11	Jesse Ventura elected governor

1998	12	Bill Clinton impeached
1999	1	Michael Jordan retires
1999	2	Jerry Falwell outs Teletubby
1999	3	Joe DiMaggio dies
1999	4	Columbine High School shooting
1999	5	STAR WARS: EPISODE 1 released
1999	6	TARZAN/SOUTH PARK in theaters
1999	7	JFK Jr/wife/sister plane crash
1999	8	Huge earthquake in Turkey
1999	9	Lauryln Hill MTV video award
1999	10	EgyptAir Flight 990 crashes
1999	11	Bonfire collapses at Texas A&M
1999	12	Puff Daddy/J. Lopez arrested
2000	1	World survives Y2K scare
2000	2	Charles Schultz dies
2000	3	AMERICAN BEAUTY Best Picture
2000	4	Elian reunited with father
2000	5	Love Bug computer virus
2000	6	Elian returns to Cuba with dad
2000	7	Concorde crashes near Paris
2000	8	Russian submarine Kursk sinks
2000	9	Abortion pill wins US approval
2000	10	Yankees win 26th World Series
2000	11	Presidential election
2000	12	Gore concedes to Bush
2001	1	Bush inaugurated as President